PO Box 10232, The Terrace, Wellington 6143

Level 4, Co-operative Bank House

20 Ballance Street, Wellington 6011

Low Emissions Economy Inquiry
New Zealand Productivity Commission
PO Box 8036
The Terrace
Wellington 6143

info@productivity.govt.nz

2 October 2017

**SUBMISSION TO THE NEW ZEALAND PRODUCTIVITY COMMISSION ON THE LOW EMISSIONS ECONOMY ISSUES PAPER AUGUST 2017**

Horticulture New Zealand, along with Tomatoes New Zealand Incorporated and Vegetables NZ Incorporated, welcome the opportunity to provide a submission to the New Zealand Productivity Commission on the Low Emissions Economy Inquiry.

We agree that it is important to investigate how New Zealand can maximise the opportunities and minimise the risks of transitioning to a lower net-emissions economy. We believe that consistency, transparency and certainty are essential to the solution.

Horticulture New Zealand (HortNZ) represents the interests of New Zealand's 5500 commercial fruit and vegetable growers. The horticulture industry is valued at over $6 billion annually to the New Zealand economy. Horticultural exports are rapidly growing, and the industry is on target to meet Horticulture New Zealand's industry mission of $10 billion by 2020. Fresh fruit exports in 2016 increased to $2.6b, an increase of $620m (35%) on 2015, notably: – Kiwifruit at $1.7b were up $491m (42%) – Apples up $130m (23%) to $692m. For the first time New Zealand's total horticultural produce exports in 2016 exceeded $5b fob value, being 19.4% and over $800m above the 2015 export value, a remarkable increase recognising that New Zealand's horticultural produce exports were $3b in 2008 and only exceeded $4b fob value in 2015.[1] Land under horticultural crop cultivation in New Zealand is calculated to be approximately 120,000 hectares.

Tomatoes New Zealand Incorporated (TomatoesNZ) is the national organisation representing New Zealand's 150 fresh tomato growers, almost all of whom grow in greenhouses. The fresh tomato industry has an annual farm gate value of $120m (March 2017), including export sales of around $10m per year.

[1] Statistics from Fresh Facts 2016 for the year ending 30 June 2016.

Vegetables New Zealand Incorporated (VNZI) is the national organisation representing 950 fresh vegetable growers with a total gate sale value of over $400m, including 128 greenhouse growers who produce domestic and export sales of over $140m.

This submission provides feedback on the questions posed in the issues paper that are most pertinent to the horticulture industry. We would be happy to meet with you to discuss this feedback in more detail.

## EXECUTIVE SUMMARY

The inquiry is extremely broad. This submission by Horticulture New Zealand, Tomatoes New Zealand Inc and Vegetables New Zealand Inc focuses on describing the challenges facing the horticulture industry, particularly indoor growing operations, to reduce their carbon footprint.

This submission also sheds light on the commonly stated assumption that converting from agriculture to horticulture would improve the country's emission profile by providing detail on the variation and complexity within the industry, right across the supply chain. We submit that a move to horticulture would be likely to reduce emissions, although the industry is facing ongoing challenges related to access to suitable growing land, RMA rules, and the position of the industry as a price-taker.

This submission emphasises the need for investment in data collection, R&D, and the implementation of new technology. We have addressed questions pertinent to the horticulture industry, and specifically indoor growing operations, and reference historical work carried out by the covered crops sector on the ETS costs and carbon use, and references our submission made to the ETS review in 2016. A copy of that submission is attached as Appendix 2.

Growers need certainty, or at least predictability, long term in order to invest and expand their facilities. There has been minimal significant investment in new vegetable greenhouse production facilities in the whole of New Zealand in the last few years, and the total area of covered vegetable production has remained relatively stable in the past five years. Determining the future of ETS is vital to providing the consistency and support needed for ongoing investment.

## RESPONSES TO INQUIRY QUESTIONS

### 5. What are the issues for government to consider in encouraging alternative low-emissions land uses?

Horticulture is often touted as an alternative land use to more emissions-intensive animal based agriculture, producing high value returns per hectare. While certainly horticulture can add value, the significance of the diversity within the industry must be acknowledged and accommodated.

With the exception of Onions and Squash, the vegetable sector is dominated by production for domestic consumption, and provides a core element of New Zealand's fresh food supply. The fruit industry is generally more export-focused. Tomatoes, capsicums and some other fresh vegetables are also exported.

Fruit and vegetable growers have varying carbon footprints, from orchards with a relatively small carbon footprint to covered crops using fossil fuel to heat. While most outdoor on-farm or orchard practices may not be emission intensive, other stages of the supply chain do produce carbon emissions, for example cooling for storage of perishable product and transportation.

The key constraints to growth in horticultural production remain access to the factors of production - in particular, land and water. Parts of the domestic supply chain are, in our view, now being affected by constraints on production that are influenced by the availability of suitable land. Of the 5.5% of land available for production in New Zealand roughly 1/10th was subdivided for lifestyle blocks in the last 15 years. Access to water and land is becoming a key constraint to growth because of competition for versatile land for housing, the availability of water at high reliability, and water quality constraints.

Horticulture is a very efficient high value industry. For a comparison, ~50,000 people are employed in the >$7 billion industry, operating from ~123,000 ha. Dairy returns around $18 billion, and employs 30,000 people from a footprint of ~2.5 million hectares. Increasingly, iwi based agribusiness is looking to expand into horticulture and Horticulture NZ has supported these groups to do so.[2]

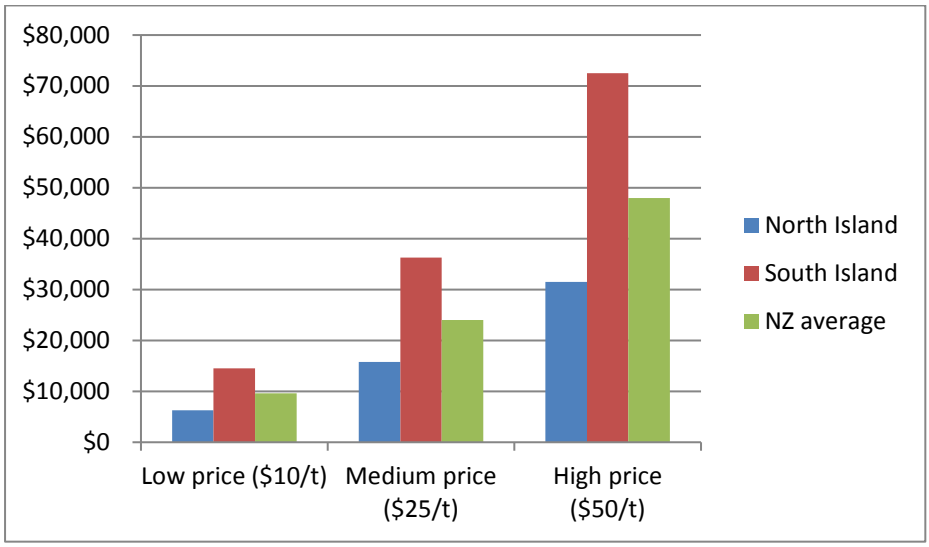
Large volumes of quality tomatoes are produced in big greenhouses built predominantly in the 1990's. Current greenhouse production is centred around Auckland, the central North Island, Nelson and Christchurch, with smaller units in other regions particularly Northland and the East Coast of the North Island. Most indoor growers are committed to year round production (one crop cycle lasts up to 10 months of the year for tomatoes) using high-technology systems. These are all hydroponic or semi-hydroponic, and use of biological pest control is common-place. Many heat their greenhouses not only for frost protection but also for total environment control to achieve increased yield, a reduction in disease issues, and to maintain consistent quality. There have been few new tomato glasshouses built in the past 10 years, though during the past 20 years yields per $m^2$ have increased significantly.

For indoor growers of fresh produce, energy is the second highest single input cost, following closely behind wages. The Emissions Trading Scheme (ETS) has a significant impact on the costs of greenhouse vegetable growing, particularly in the South Island where growers largely rely on coal boilers for heating (Figure 1). Presently, those growers do not have commercially viable lower emission alternative energy sources, as there is no natural

[2] "Submission on the Proposed National Policy Statement for Urban Development Capacity," Horticulture New Zealand, July 2016.

gas supply in the South Island, and wood chip and waste oil as energy sources have their challenges (discussed more in response to question 18).

**Figure 1** Total ETS costs per hectare (excluding the 2-for-1 transition measure) for North and South Island indoor vegetable growers at three different carbon prices.




*Source: Tomatoes New Zealand Incorporated and Vegetables New Zealand Incorporated figures*

A carbon footprinting study in 2008[3] found that 86% of carbon emissions were generated from the greenhouse heating stage in a vegetable crops lifecycle from production to consumer. This rose to 92% for a coal heated tomato crop in Christchurch. A grower survey in 2004 (67% response rate) on greenhouse energy use found the average greenhouse heating system released 96 $kgCO_2/m^2$. This varied between 70 and 175 $kgCO_2/m^2$ for a North Island gas heated operation and South Island coal powered operation respectively.

When the ETS was introduced, the many growers invested in energy efficiency improvements in greenhouses. The Energy Efficiency & Conservation Authority (EECA) was also involved in assisting in a couple of conversions of coal boilers to wood chip burners. However technology and energy conservation developments in the industry have stagnated since the late 2000's, as EECA's support ran its course; no further energy efficiency gains were available without replacing entire greenhouses; and sourcing alternative low-carbon fuels proved difficult.

The minimum capital investment for new greenhouses, starting from bare land, requires approximately $1 - $2 million per hectare. Despite the high investment cost, internationally covered cropping and investment in new glasshouses has exploded in recent years, particularly in nearby countries such as Australia and Korea. This is being driven by the simultaneous pressures from consumers for high-quality, safe, year round supply of produce, along with increasingly volatile weather raising the risks and costs for growers, and overseas government support for these new developments. It is therefore vital to New Zealand horticulture's ability to continue both feeding New Zealand and increasing its contribution to the economy that climate change policy and investment in new technology add value and enable growers to continue to grow and evolve their businesses.

[3] "The Carbon Footprint of NZ Greenhouse Grown Tomatoes and Capsicums Life Cycle Assessment" AgriLink NZ, August 2008

**17. What are the main opportunities and barriers to reducing emissions in waste?**

There is an opportunity for improved composting of greenhouse green waste. The usual practice in greenhouses is to remove greenwaste (such as leaf pruning's) from the site as it is a potential source of disease. Before greenwaste can be composted, growers need to remove plastic clips and strings that are used during the plant growth. There are currently trials being undertaken by several growers using bio-degradable clips however to date these have not been robust to last throughout the crop. In addition, many of the bio-degradable clips currently available are made with materials such as corn starch which composters won't use.

Bio-digesters could be an option for consideration and to do so these would need to priced effectively for use by growers, and effectively deal with the non-plant component of the waste. Co-generation of energy from waste that is then used by a greenhouse is also worthy of further exploration, although a greenhouse would not have enough waste to meet all its energy needs.

**18. Policies to lower emissions from particular sources, technologies and processes can have interactions with emission sources in other parts of the economy. What are the most important interactions to consider for a transition to a low emission economy?**

There has been considerable talk about the ability to switch fuel sources, in particular among South Island greenhouse vegetable producers with coal boilers, and the idea that they could convert to wood fuel, or perhaps waste oil. While some growers have converted, it is not an industry wide solution currently. For many growers the logistics of stockpiling the quantity of wood required, transporting a bulky low energy density product, resource consent requirements for storage facilities and the scarcity and inconsistency of supply precludes this as a viable option for most. Some of our smaller growers are using waste oil however this also comes with handling and storage issues which can be a barrier along with availability. The capital cost of conversion to alternative fuels is high, particularly for small and medium sized operations. In most cases there is no commercially viable alternative, especially given limited availability of quality biomass in NZ, and growers report that they are not confident of securing a consistent supply.

In addition, there is a trade off with the costs to grow fruit and vegetables vs. imports. Horticulture is a commodity based business, being price takers rather than cost plus. We face strong competition here in New Zealand from imports from Asia particularly for processed products such as frozen vegetables and canned fruit and vegetables. Greenhouse growers face direct competition with increasing indoor production globally, and we're particularly seeing this currently with Australian growers significantly increasing their investment in greenhouses. Increasing the cost of carbon without providing growers with viable alternatives is likely to come at a cost to our global competitiveness. With an increasing demand for fresh produce domestically, the importance of New Zealanders being able to maintain access to affordable locally grown fruit and vegetables should not be overlooked, considering national nutritional health and future-proofing food security.

*"For commodity producers such as growers our whole pricing structure is based upon commodity trading rather than cost plus. Unlike a petrol wholesaler or electricity generator, we don't have the ability to add the cost of carbon to our price. Additionally renewables (e.g. wood fired heating systems) have shown to be uneconomic and questionable in exactly how much carbon is saved once you take into account the processing and delivery costs."*[4]

To enable consideration of lower carbon fuel options, support at a regional level is required to ensure factors such as stability of price, availability, and consistent quality of alternative fuels is considered. Currently proximately to source of alternative fuels, limited quantity and fluctuating quality are all limitations to effective transition.

**19. What type of direct regulation would best help New Zealand transition to a low-emissions economy?**

Any regulations need to be viable, enabling, and outcomes-focused. They should take into account the impact on fruit and vegetable growers, particularly if horticulture is considered to be an important alternative land-use and if New Zealand values a continued supply of New Zealand grown produce.

**20. Acknowledging the current review, what changes to the New Zealand Emissions Trading Scheme are needed if it is to play an important part of New Zealand's transition to a low-emissions future?**

The extra energy costs due to ETS still presents a considerable threat to many greenhouse businesses. Growers are unable to pass on the extra ETS costs; these become absorbed as part of the total costs of doing business. As previously discussed, New Zealanders need price security for their fruit and vegetable supply and as exporters we need to be globally competitive.

Commercial tomato, capsicum, cucumber and eggplant growing is recognized as Emissions Intensive Trade Exposed industry, and as such growers of these products can claim an annual allocation of New Zealand Units, based on their yields. For a number of growers particularly those using coal for heating in the South Island, and those who grow low yielding varieties (e.g. specialty and cherry types of tomatoes, whose prominence has increased in the past 10 years) the "free" unit allocations only offset a small proportion of the extra heating costs. The allocation calculation is based on production of large loose tomatoes and not the dollar value of the growing specialty segments. The Industrial Allocation scheme has been tagged for review post 2020, with indications that a phase out of this scheme is likely to begin.

Growers are also impacted by the phase-out of the one-for-two emissions trading scheme subsidy that began from 1 January this year. That is when the previous 50%-unit cost increased to 67%. It will rise to 83% from 1 January 2018. All sectors in the ETS will pay the full market price from 1 January 2019. The phase out was announced in May last year following the first stage of a review of the ETS[5]

[4] *North Island Hothouse Grower*

[5] 'Emissions subsidy phase-out is underway', 15th March 2017, http://www.tomatoesnz.co.nz/hot-topics/ets/

**21. What type of market-based instruments would best help New Zealand transition to a low-emissions economy?**

HortNZ, TomatoesNZ and VNZI recognise the need for a robust framework for carbon trading and the requirement for businesses to plan for a more carbon constrained future. However the fact that New Zealand does not currently have access to units on the international market and has a closed market trading at a higher unit rate than the international rate with no agreed rules on forestry and land-use is a cause for concern.

The international market places we export to either do not have schemes placing a value on carbon, or are likely to provide exemptions to their domestic growers, who are our competitors. For example, the trend of increasing greenhouse gas emissions in Australia since the carbon tax was repealed in 2014 is troubling when you take into account the growing investment in greenhouse vegetable infrastructure currently taking place there.

In Canada, the Canadian Horticultural Council (CHC) is working with the federal government to understand the impact of carbon pricing on their industry's competitiveness and potential for growth. *'Greenhouse growers have developed innovative ways to recycle the carbon they produce as food grade CO2 for their plants. However, such sustainable innovation has not been recognized in a uniform way across Canada, resulting in disparate carbon pricing policies between provinces. The added costs of these policies, together with the capital-intensive infrastructure needed for the construction of greenhouse facilities, makes the sector vulnerable to "carbon leakage", whereby companies, in an attempt to remain competitive, expand their operations in jurisdictions that aren't subject to carbon pricing (such as the U.S. and Mexico). Due to the global nature of the produce market, new costs of production are not easily passed onto consumers. This reality impacts the price of domestically-grown food in the marketplace and, ultimately, Canada's competitiveness.'*[6]

**22. What type of support for innovation and technology would best help New Zealand transition to a low-emissions economy?**

The support for innovation and technology that would best help NZ transition to a low-emissions economy would be investment in Research & Development for alternative, innovative technology that is fit for purpose in NZ, and would allow the horticulture sector to not only adapt but continue to grow.

Supporting indoor growers through provision of grants for low emissions conversion and improvements may effect change. We have seen examples where this has been successful within the Horticulture industry such as an EECA grant supporting a Marlborough grower's conversion from coal to wood chip. In addition, investigation of alternatives that are not currently used, such as solar heating or alternative biomass options is a worthy of further investigation, especially for South Island indoor growers.

Overseas, Climate-KIC, a European public-private innovation partnership involving the public sector, academic institutions and businesses, has been addressing climate change mitigation and adaptation through collaboration projects including funding a case study on reducing the carbon footprint of greenhouse horticulture. Such collaborations may be worthwhile to empower stakeholders across New Zealand to lead transformation.

[6] Canadian Horticultural Council, http://www.hortcouncil.ca/en/advocacy/environment/

There also needs to be solutions for high emission parts of the supply chain, such as transport, storage, and cooling.

The best support that could be offered to industry or individual growers is investment into research and development of low emission technologies, and support for operators to take on this new technology, for example conversion grants or incentives.

**25. In addition to "core" climate policies and institutions, what other changes to policy settings or institutional frameworks are required to effectively transition New Zealand to a low-emissions economy?**

Ensure that regional council rules and processes and the Resource Management Act support, or at least do not hinder, Low Carbon Emission options. For example rules support installation of energy-generation or waste-minimisation technology.

**26. What are the main uncertainties affecting New Zealand businesses and households in considering investments relevant to a low-emissions future? What policies and institutions would provide greater confidence for investors?**

The low emissions economy is a long-term aim, and the process needs to provide long-term certainty for businesses and households in New Zealand. The horticulture sector is faced with some specific uncertainties concerning the impacts of the rise of production costs due to ETS costs (e.g. rising energy costs; costs of dealing with waste) and therefore a need to increase in sale price of produce as a result of this. This raises concern over the potential for cheaper imported product substituting for our locally grown produce.

Areas for consideration include what the carbon price will be in the future, affordable and available heating alternatives, and the storage and supply of low emissions fuel sources. For example, following the introduction of the ETS, the industry explored ways of improving energy efficiency and worked with EECA to communicate to growers the possibility of converting to lower-carbon fuels. During this time a handful of South Island greenhouse growers converted to wood chip, but there are issues with using wood chip and another low carbon alternative, waste oil including:

1. Wood chip requires 7 – 10 times the fuel volume to generate the equivalent BTU heat rate as coal, this means 7 – 10 truckloads to provide the equivalent output of one truckload of coal
2. Biomass fuel (woodchip) being carried considerable distances to greenhouses
3. Capturing $CO_2$ from the flue in order to raise the levels in the greenhouse to around 1,000 ppm, as is the case with gas, is difficult with wood chip burners, also making the switch less desirable (in the North Island)
4. The moisture content of wood chip can be very inconsistent
5. There is no geo-thermal power supply (as there is in Taupo) in the South Island
6. There is no natural gas supply (as in Taranaki to Northland) in the South Island
7. There is no recycled oil supply in Nelson/Blenheim (as in Christchurch, where most of all of the available oil is under contract to schools and hospitals)
8. Electricity is cost prohibitive

**28. Is New Zealand's current statutory framework to deal with climate change adequate? What other types of legislation might be needed to effectively transition towards a low-emissions economy?**

Any further legislation should be outcomes-focused and not raise uncertainty or complexity.

**31. What types of analysis and underlying data would add the greatest value to this inquiry?**

It is difficult to assess policy without data. This is highlighted in the lack of attention given to the implications of a low-emission economy on horticulture while at the same time advocating for horticulture as a potential land use repurpose for animal based industry. In order for the agriculture and horticulture industries to make best formed judgements as asked during the inquiry process, robust and clear data on the current and projected impacts of climate change on the horticulture industry is essential. Without this data, assessment can be only conjecture.

Earlier this year we were disappointed that an application to the Ministry for Primary Industries Sustainable Land Management and Climate Change research fund did not receive funding. That project "*Energy-related GHGs in New Zealand's agrifood exports: quantification and implications*" led by Otago University's Centre for Sustainability, would have quantified energy-related GHG emissions throughout the agrifood system from farms to international markets, focusing on key export sectors. Working with sector organisations, the project was to identify strengths and weaknesses of their degree of reliance on fossil fuels, and any global or local trends which could create future vulnerabilities (e.g. increasing market sensitivities to carbon footprints; increasing carbon prices; oil price rises). This project would have looked at both Agriculture and Horticulture, whereas the winning project bid is only looking at Agriculture.

**32. What should be the mix, and relative importance of, different policy approaches (such as emissions pricing, R&D support, or direct regulation) in order to transition to a low-emissions economy?**

The emphasis needs to ensure that NZ vegetables and fruit is not priced out of the market by ETS or emissions compliance costs, when our international competitors do not face the same pressure or costs. Currently our largest indoor growers rely on international trade to sell all of what they grow and by doing so use their scale to keep local prices down vs imports.

Additional emphasis needs to be placed on R&D support. In order for the horticulture industry to effectively adapt to a low-emissions economy, growers will benefit most not from heavy handed policy but from the availability of practical technology, demonstrating the benefits of a low-emissions economy.

**33. What are the main co-benefits of policies to support a low-emissions transition in New Zealand? How should they be valued and incorporated into decision making?**

HortNZ, TomatoesNZ and VNZI would be particularly supportive of policies that not only encourage the reduction of emissions but also improve resilience and competitiveness of horticulture. There would be great benefits to New Zealand of an increase in horticulture, but it is important to remember that a lot of horticultural products are highly perishable and therefore refrigeration and prompt transport are essential. The complexity and variety of horticulture must be considered.

**34. Who are the most important players in driving forward New Zealand's transition to a low-emissions economy?**

The most important players in driving forward New Zealand's transition to a low-emissions economy is those who are expected to change their behaviours to enact this change. Therefore, in order for the horticultural industry to transition to a low carbon economy, science and innovation to support businesses is crucial.

**35. What measures should exist (and at what scale and duration) to support businesses and households who have limited ability to avoid serious losses as a result of New Zealand's transition to a low-emissions economy?**

Fruit and vegetable growers currently have very few or no options for mitigating the financial impact on their business of increasing emissions related costs. They are price-takers, open to competition and substitution from the international market. Particularly in the South Island, there is little that can be done to reduce or mitigate emissions with currently available technology. Therefore access to the industrial allocation of New Zealand units should continue for indoor growers until they have viable transition options.

**36. What are the essential components of an effective emissions-mitigation strategy for New Zealand that will also be economically and politically sustainable?**

Certainty of policy settings and pricing, investment in technology development and implementation, and collection of data and modelling of impacts.

**38. How should the issue of emissions leakage influence New Zealand's strategy in transitioning to a low-emissions economy?**

The Commission must consider the impacts on fresh, New Zealand-grown fruit and vegetables that the low-emissions economy will have. The horticulture industry agrees that it is important to investigate how New Zealand can maximise the opportunities and minimise the risks of transitioning to a lower net-emissions economy. We believe that consistency, transparency and certainty are essential to this process.

The horticulture industry recognises and acknowledges the value and importance for the environment of a low-carbon economy. The most important impact of the transition to a low-carbon economy for the horticulture industry would be the increase in the cost of fresh fruit and vegetables – especially perishable goods – for domestic supply. If the locally grown supply is priced out of the market, we will get import substitution and NZ growers' businesses will disappear. New Zealanders would have reduced access to fresh, New Zealand-grown fruit and vegetables and be subjected to the carbon footprint involved with the supply chain of imported product.

The conversation around moving to a low-carbon economy is based on the assumptions that New Zealand is more efficient than other countries. We need robust data to back up this assumption.

**39. What does your long-term vision for a low-emissions economy look like? Could a shared vision for New Zealand be created, and if so, how?**

We submit that it is important to investigate how New Zealand can maximise the opportunities and minimise the risks of transitioning to a lower net-emissions economy. It is important that New Zealand families and businesses are taken on the journey. We believe that consistency, transparency and certainty are essential to the solution. New Zealand has

a strong economy and can become more competitive and productive through development and implementation of technology and best practice, as long as our businesses are not pushed out of the market during the transition.

**SUMMARY**

We welcome the issues paper and commend the Commission for providing this opportunity for discussion. The issues paper canvasses a wide, diverse and complex set of issues. As demonstrated by our submission, each point is worthy of its own extensive submission. We would be happy to discuss the points laid out in our submission and any other issues the Commission considers relevant to progressing its inquiry. We look forward to working closely with the Commission as the inquiry proceeds.

Yours sincerely

Mike Chapman
Chief Executive
Horticulture New Zealand

Helen Barnes
Senior Business Manager
Tomatoes New Zealand Inc.

John Seymour
Senior Business Manager
Vegetables New Zealand Inc.

**APPENDIX 1: WORKS CITED**

The New Zealand Institute of Plant and Food Research Ltd, “Fresh Facts,” Ed. A.G. Aitken & E.W. Hewitt, 2016.

Barber, A. “The Carbon Footprint of NZ Greenhouse Grown Tomatoes and Capsicums Life Cycle Assessment” AgriLink NZ, August 2008

Verbal communication, North Islander Hothouse Grower

Tomatoes NZ Inc, “Emissions subsidy phase-out is underway”**,** 15th March 2017. http://www.tomatoesnz.co.nz/hot-topics/ets/

Horticulture New Zealand, ““Submission on the Proposed National Policy Statement for Urban Development Capacity,” July 2016.

Canadian Horticultural Council, http://www.hortcouncil.ca/en/advocacy/environment

**APPENDIX 2: SUBMISSION TO THE MINISTRY FOR THE ENVIRONMENT ON "NEW ZEALAND EMISSIONS TRADING SCHEME REVIEW 2015/2016"**

PO Box 10232, The Terrace, Wellington 6143

Level 4, Co-operative Bank House

20 Ballance Street, Wellington 6011

NZ ETS Review Consultation

Ministry for the Environment

PO Box 10362

Wellington 6143

nzetsreview@mfe.govt.nz

30 April 2016

**Submission to the Ministry for the Environment on "New Zealand Emissions Trading Scheme Review 2015/2016"**

Horticulture New Zealand, along with Tomatoes New Zealand and Vegetables NZ Inc. welcome the opportunity to provide a submission to the Ministry for the Environment on the NZETS review. HortNZ and TNZ recognise that changes are required to reflect recent international climate change negotiations.

Horticulture New Zealand (HortNZ) represents the interests of New Zealand's 5,600 Commercial fruit and vegetable growers. The horticulture industry is valued at over $6 billion annually to the New Zealand economy.

Tomatoes New Zealand Inc. (TNZ) is the national organisation representing New Zealand's 150 fresh tomato growers, almost all of whom grow in greenhouses. The fresh tomato industry has an annual farm gate value of $100m.

Vegetables NZ Inc. (VNZI) is the national organisation representing 950 fresh vegetable growers (total gate sale value $340m) including 128 greenhouse growers who produce domestic and export sales of over $140m

HortNZ, TNZ and VNZI made a submission to the February review of Priority Issues, covering:

1. Moving to full surrender obligations
2. Managing the costs of moving to full surrender obligations

This submission covers the other review issues, namely:

1. Business responses to the NZ ETS
2. Protecting competitiveness through free allocation

3. Managing unit supply, including issues relating to international units and selling NZU's by auction
4. Managing price stability
5. Operational and technical matters
6. Addressing barriers for uptake of low emissions technologies.

Questions from the two technical notes (Forestry, and Operational Matters) have not been addressed in this submission, as they are not relevant to commercial growers of fruit and vegetables.

**Executive summary- key points**

Considerations that need to be taken into account when deciding on the structure of the NZETS from a horticultural perspective

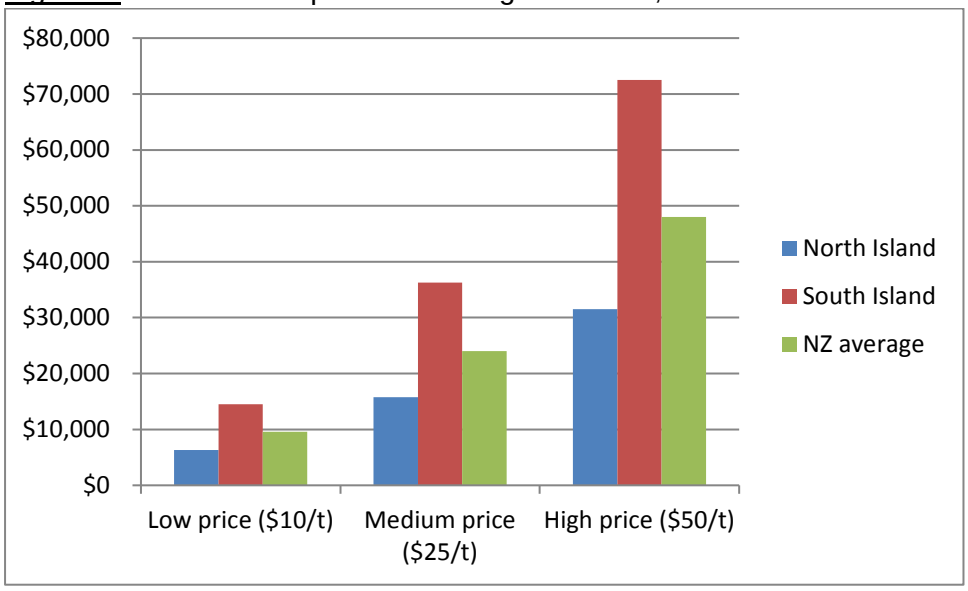
- Growers do not have the ability to pass on any ETS cost increase on a "cost plus" basis to their customers.
- Growers report that if carbon costs rise significantly, they will not invest in replacing aging greenhouses;
- This could lead to a demise of domestic production where growers find they are unable to pass rising ETS costs on;
- The lack of options, cost and practicality of covered crops growers moving to biofuels and the security of supply of these biofuels;
- The ability to achieve government goals of doubling primary sector exports in New Zealand whilst competing with countries that have not imposed a cost of carbon on exporters
- The ability to administer and understand the system and the willingness of brokers to deal with small parcels of credits, (an efficient aggregation and brokering process is needed).

**BACKGROUND**

The costs of energy incurred by horticultural businesses includes direct energy costs as well as those indirect costs passed on to them through the price of the inputs they purchase (packaging, fertiliser, machinery etc.), and any costs passed to them by post-harvest operators such as pack houses, cool stores, and freight companies.

For the greenhouse vegetable industry, including fresh tomatoes, capsicums and cucumbers, energy is the second highest single input cost in greenhouse expenses following closely behind wages. In climate controlled greenhouses (excluding those that either do not heat or only have frost control) energy costs are greater than 20% of expenses, or between 15% and 18% of revenue. Therefore they are highly vulnerable to rising energy costs and additional energy related taxes. Because the vast majority of fruit and vegetable growers sell in a commodity market, neither the direct nor indirect costs can be passed on to the consumers of the produce, instead incurring a direct net loss to the business. Figure 1 shows the total ETS costs per hectare (excluding the 2-for-1 transition measure) for North and South Island growers at three different carbon prices. Growers do not have the ability to pass on any ETS cost increase on a "cost plus" basis to their customers.

Figure 1: Carbon costs per hectare of greenhouse, without transition measures




As such they have been recognised under the EITE (Emissions Intensive Trade Exposed) scheme with free allocations. HortNZ, TNZ and VNZI are encouraged to see that the discussion document states that 'The government supports keeping the free allocation regime in place until at least 2020'[7]. For the reasons explained below, the cost of carbon to many indoor growers is impossible to pass on to consumers, and will have negative consequences on the availability of New Zealand grown vegetables.

Horticulture is a commodity based business, being price takers rather than cost plus. The horticulture industry in New Zealand operates in a global market with over 60% of our production exported and we face strong competition here in New Zealand from imports from Asia particularly for processed products such as frozen vegetables and canned fruit and vegetables. Greenhouse growers face direct competition with Australian product, both on the New Zealand domestic market and in the Australian market, and with product from many other countries in Asian markets.

There has been considerable talk about the ability to switch fuel sources, in particular among South Island greenhouse vegetable producers with coal boilers and the idea that they could convert to wood fuel, or perhaps waste oil. While some growers have converted, it is not an industry wide solution. For many growers the logistics of stockpiling the quantity of wood required, transporting a bulky low energy density product, resource consent requirements for storage facilities and the scarcity and inconsistency of supply precludes this as a viable option for most. The capital cost of conversion to alternative fuels is high, particularly for small and medium sized operations. In most cases there is no commercially viable alternative.

Greenhouse growers are delaying future investment in New Zealand until there is some determination as to the future of the ETS. This is not just a South Island phenomenon, as there has been little significant investment in new vegetable greenhouse production facilities in the whole of New Zealand in the last few years, and the total area of covered vegetable production has remained stable in the past five years other than one capsicum grower who has invested in expanding their production for anticipated increased exports.

[7] Page 3, section 1.

Because there has been little re-investment in replacement of existing greenhouses during the past 10 years, most will approach the end of their efficient productive lifespans in the next 5 -10 years. Growers in both islands report that they are unlikely to reinvest in new production facilities if ETS costs continue to rise to a point that makes production un-economic.

With no new production area, increasing domestic food demand will likely be met by imports from countries with significantly higher greenhouse gas emitting production systems. The uncertain future of the ETS and the scarcity of capital are the key factors holding back investment in alternative technologies and any new investment in greenhouse vegetable production.

HortNZ, TNZ and VNZI recognise the need for a robust framework for carbon trading and the requirement for businesses to plan for a more carbon constrained future. However the fact that New Zealand does not currently have access to units on the international market and has a closed market trading at a higher unit rate than the international rate with no agreed rules on forestry and land-use is a cause for concern. The international market places we export to either do not have schemes placing a value on carbon, or are likely to provide exemptions to their domestic growers, who are our competitors.

HortNZ represents fruit and vegetable growers with varying carbon footprints from orchards with a relatively small carbon footprint to covered crops using fossil fuel to heat. There has been a lot of work done on carbon footprinting (carbon emissions) and potential carbon sequestration and whilst this is not being considered in the current framework and is in the 'too hard basket' along with soil carbon and agricultural emissions, it is worth noting for future reference. The main focus of the discussion document is on protecting New Zealand's export based economy but horticulture is also important to the domestic market. The importance of being able to source New Zealand grown fruit and vegetables should not be overlooked, considering national nutritional health and future-proofing NZ's food security.

Relying on imported produce ultimately leads to increased prices for our consumers, and almost certainly higher global carbon emissions.

## QUESTIONS

### Context and drivers for the review

**1. Do you agree with the drivers for the review?**

Yes, a robust framework that provides certainty for growers is needed. We do support the need for businesses to prepare for a more carbon constrained future and recognise that the "NZETS is the principle policy response to climate change'.

However, the international context and global policy response to the climate change issues is uncertain as are the rules governing international carbon markets and access for New Zealand to those markets at affordable prices. It would be prudent therefore to consider longer timeframes of transition to ensure that New Zealand policy does not adversely impact our export based economy and ability to produce fruit and vegetables for the domestic and international markets.

3. **What other factors should the Government be considering in this NZ ETS review?**

This review should consider NZ's food security; export earning potential; and possible unintended consequences and perverse outcomes of an increasing carbon price. In 2013 New Zealand imported $85 million of fresh vegetables and $30 million of processed vegetables.

The ability of New Zealand's horticulture to feed New Zealand and increase exports to boost the economy depends on a multitude of factors including access to high quality soils, infrastructure, labour, power, fuel and water.

We are supportive of growers improving sustainability and lowering their carbon footprint where possible.

However as a small country exposed to international market competition both domestically and internationally, several factors outside of the government's control could affect the viability of the sector. These include:

- Potential increased cost of the domestic food supply if full surrender is implemented and the potential demise of domestic production where growers find they are unable to pass costs on;
- The lack of options, cost and practicality of covered crops growers moving to biofuels and the security of supply of these biofuels;
- Ability to achieve government goals of doubling primary sector exports in New Zealand whilst competing with countries that have not imposed a cost of carbon on exporters

The impact of policy decisions relating to the NZETS will have an effect on the bottom line of horticultural businesses in varying ways depending on fuel use, fertiliser use and other downstream supply chain costs that may not have been considered in the NZIER report.

By 2050, the global population is predicted to increase to more than nine billion people, and the horticultural produce required to feed them will be almost double that of today. Close to four billion tonnes of fruits, vegetables and pulses will be required, in a world of increasing environmental pressures and decreasing land availability[8].

New Zealand will have an important role to play in this changing landscape, providing high quality food both for its own people and for the growing global population. It is important that the market is balanced and that it is cost effective for New Zealand to produce its own food. This balance may be threatened especially in the winter months if the ETS targets greenhouse growers. It is important that industries are treated in an equitable way when assessing the effects of the industry. It is noted that there are no plans at present to offset agricultural emissions and industrial processing activities related to this industry are also not being offset or taxed for their emissions. As such it is inequitable to target New Zealand's greenhouse growers whilst other industries are not having to address their impacts. If the EITE scheme is not increased when the 2 for 1 surrender is imposed this could seriously affect the viability of growers and may put them out of business.

## Other issues: business responses to the NZ ETS

### Background to greenhouse sector business responses to the NZ ETS

[8] *(http://www.plantandfood.co.nz/growingfutures/horticulture)*

A carbon footprinting study in 2008 of greenhouse production found that 86% of carbon emissions were generated from the heating stage in a vegetable crops lifecycle from production to consumer. This rose to 92% for a coal heated tomato crop in Christchurch.

A grower survey in 2004 (67% response rate) on greenhouse energy use found the average greenhouse heating system released 96 $kgCO_2/m^2$. This varied between 70 and 175 $kgCO_2/m^2$ for a North Island gas heated operation and South Island coal powered operation respectively.

**Impact of ETS and carbon price changes**

South Island operations have high emissions due to a combination of cooler climate and coal being the predominant fuel heating source. These growers obviously cannot control external air temperatures, and there are negligible opportunities to change to an alternative fuel source.

Table 1 shows that the ETS Industrial Allocation Scheme covers approximately 60% the average ETS costs; slightly more than offsetting the costs for carbon efficient Auckland operations, and less than half for South Island operations.

Table 1: The impact of higher carbon prices and removing the 1 for 2 obligation for a one hectare greenhouse tomato operation.

| | Carbon emissions ($tCO_2/ha$) | Low price ($10/t) | Medium price ($25/t) | High price ($50/t) |
|---|---|---|---|---|
| **North Island** | 630 | $6,300 | $15,750 | $31,500 |
| **South Island** | 1,450 | $14,500 | $36,250 | $72,500 |
| | | | | |
| **NZ average** | 960 | $9,600 | $24,000 | $48,000 |
| | | | | |
| **ETS Allocation*** | 450t tomatoes/ha | $7,000 | $17,600 | $35,100 |

* allocative baseline 2.6006

**QUESTIONS**

**9. Do you consider the future cost of emissions in your business planning?**

**If yes, how do you do this? If no, please explain your answer?**

Greenhouse growers, particularly in the South Island, are considering the future cost of emissions in their business planning as the NZU price rises and with the possibility of the 2-for-1 surrender and industrial allocation schemes phasing out.

At the lower carbon prices South Island operations have been forced to absorb the additional carbon costs that have not been offset through the Allocation Scheme. However, as the carbon price approaches $25 and upwards the net carbon cost of $37,000 ($72k - $35k) will make South Island coal burning operations uneconomic. Without question, removing the Allocation Scheme will force these operations out of business.

There has been no expansion of greenhouse production in the South Island since the NZ ETS scheme began, and unless there is a viable, cost effective and low emission energy source made available in the next five years, those operations will become un-economic. As the carbon price reaches $50/t, carbon will become the 3rd most expensive operating cost behind labour and energy.

**10. What would improve your ability to take into account the future cost of emissions in your business planning?**

- Increased certainty about the availability of the Industrial Allocations Scheme;
- Certainty of the carbon price (e.g. price ceiling); and,
- Minimal variability in price.

### Other issues: protecting competitiveness through free allocation

**11. Under what conditions should free allocation rates start to be reduced after 2020?**

Free allocations should not be reduced until NZ's trading partners and potential international competitors face the same carbon price burden as New Zealand producers, and cost-effective, viable, alternative low-carbon fuel sources are widely available.

**12. What impact would it have on your investment decisions over the next few years if there was a clear pathway or criteria for phasing out of free allocation after 2020?**

Growing in the South Island would become uneconomic using coal, adding $31,000 per hectare to production costs, unless there are viable energy alternatives.

Even North Island producers using more carbon-efficient natural gas will be significantly impacted without an offset (Industrial Allocation) of their carbon costs, and report that they will be unlikely to re-invest in new glasshouses as their old ones become uneconomic.

Other high value inputs high inputs like fertiliser and transplants are also likely to become more expensive due to increasing carbon costs, further eroding profitability.

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## Other issues: managing unit supply - forestry

**13. – 15. Not applicable**

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### Other issues: managing unit supply – international units

**16. If international units are eligible for NZ ETS compliance in the 2020s, should any of the following restrictions be placed on their use?**

**a) restrictions on where units can be sourced from (location of and/or types of projects)**

International units should be available to ensure growers can maintain international competitiveness. If higher carbon-footprint imports replace NZ-grown produce because

those imports pay lower carbon costs, then NZ will have lost its own more efficient growers and the domestic and export income that goes with them.

**b) restrictions on how many units can be surrendered**

As above, any restrictions on availability would limit international competitiveness.

### Other issues: managing unit supply – auctioning

**17. Should auctioning be introduced in the NZ ETS?**

Auctioning should not be introduced at the expense of industrial allocations.

**18. What should be the role or purpose of an auctioning function in the NZ ETS, if one were introduced?**

**a) to align supply in the NZ ETS more closely with our international target**

Yes, but only if industrial allocations continue.

**b) to more actively manage NZU prices**

Price certainty is important to producers so that rational business decisions can be made. The benefits of actively managing prices through an auction system would depend on the management policy – if stability was the key goal then this is a positive role.

**c) other**

Auctioning could be of value if it increases the price transparency of NZU's, preventing energy companies charging inflated prices.

### Other issues: managing price stability

**20.What impact has carbon price volatility in the NZ ETS had on your business?**

While the prices have been low, volatility has had minimal impact. However, as prices increase, any volatility will begin to have a greater impact on horticultural businesses. Volatility at higher carbon prices would likely affect businesses profitability from year to year, adding to uncertainty, making planning difficult, and making it more likely for growers to exit the industry.

**21. Do you think measures should be in place to manage price stability?**

Yes, the upper price limit should remain, to prevent price spikes putting grower-businesses at risk.

**22. What do you consider are important factors for managing price stability?**

**a) upper price limits (eg, fixed price option, or a price ceiling implemented through an auctioning mechanism)**

Yes

**b) lower price limits (eg, price floor)**

Less important as low prices have less effect on grower profitability.

**23. What should the Government consider when managing price stability?**

Business competitiveness in comparison to trading partners; and the carbon emissions of potential import substitutes.

## Other issues: operational and technical matters

**24. Are you aware of ways the administrative efficiency of the NZ ETS could be improved?**

The median sized heated greenhouse operation is 2,400 $m^2$, while the largest is over 200,000 $m^2$. The larger operations have been able to organise carbon exchange programmes directly with their energy supplies, however this is administratively too onerous for the value involved for the majority of businesses. The allocation of carbon for the majority of operations is less than 170 t carbon per annum, valued at less than $1,000 (at $5/t$CO_2$). Brokers have been unwilling to deal with such small parcels and even if growers could aggregate them, the administration cost is likely to be prohibitive. Effectively the cost of carbon has become another expense that growers have absorbed, as they are unable to pass this onto their customers. While higher carbon prices will make accessing the Allocation Scheme more important, an efficient aggregation and brokering process is needed.

## Other issues: addressing barriers to the uptake of low emissions technologies

**26. Are there any barriers or market failures that will prevent the efficient uptake of opportunities and technologies for reducing emissions?**

Yes. There are significant barriers to uptake of technologies to reduce emissions for greenhouse growers.

The area under greenhouse production has been fairly static in the past 10-15 years, with only a few new glasshouses having been erected. Those newer glasshouses have greater energy efficiency. They are more airtight, and they have built-in energy and sunscreens, although these can cause problems with humidity in warmer Northern climates, but are effective in cooler climates[1]

Most greenhouses are at least 15 years old. These were not built with energy efficiency in mind, and retro-fitting of energy saving technologies is expensive and tends to make relatively small energy savings[1].[i]

Following the introduction of the ETS, the industry explored ways of improving energy efficiency and worked with EECA to communicate to growers the possibility of converting to lower-carbon fuels[1].

A handful of South Island greenhouse growers converted to wood chip, but there are issues with using wood chip and another low carbon alternative, waste oil:

9. Wood chip requires 7 – 10 times the fuel volume to generate the equivalent BTU heat rate as coal, this means 7 – 10 truckloads to provide the equivalent output of one truckload of coal
10. Our largest South Island glasshouse capsicum crop grower is in Nelson and the nearest woodchip supplier is in Blenheim over 100km away
11. Capturing $CO_2$ from the flue in order to raise the levels in the greenhouse to around 1,000 ppm, as is the case with gas, is difficult with wood chip burners, also making the switch less desirable
12. The moisture content of wood chip can be very inconsistent
13. There is no geo-thermal power supply (as there is in Taupo)
14. There is no natural gas supply (as in Taranaki to Northland)
15. There is no recycled oil supply in Nelson/Blenheim (as in Christchurch, where most of all of the available oil is under contract to schools and hospitals)
16. Electricity is cost prohibitive

**27. If so, is there a role for the Government in addressing these barriers or market failures and how should it do this?**

Industry would be prepared to work with Government on research into low emission technologies or fuels for greenhouses. However it needs to be noted that New Zealand may not have the scale in this small industry to make the conversion to such technologies viable or cost efficient for growers at this time.

[i] [1] Personal communication, Stefan Vogrinic, greenhouse consultant, April 2016