SUBMISSION ON

Reforming industrial allocation in the New Zealand Emissions Trading Scheme

17 September 2021

To: Ministry for the Environment
Name of Submitter: Horticulture New Zealand, Tomatoes New Zealand and Vegetables New Zealand
Supported by: New Zealand Plant Producers Incorporated, United Fresh New Zealand Incorporated

Contact for Service:
Michelle Sands
Manager - Environment
Horticulture New Zealand
PO Box 10232 WELLINGTON
Ph: 04 470 5664
Email: michelle.sands@hortnz.co.nz

Horticulture™ New Zealand
Ahumāra Kai Aotearoa

OVERVIEW

Submission structure

1. Part 1: Overview of HortNZ
2. Part 2: Introduction and context
   - Industry context
   - Impacts of rising ETS costs for the greenhouse growing sector
   - Role greenhouse growing systems have to play in a low emissions future
   - Transition to a low emissions economy
3. Part 3: Industrial allocation in the ETS
   - Current state industrial allocation for horticultural EITE activities
   - Emission and energy intensity improvements in the sector
   - Current design of industrial allocation is not well suited to the greenhouse horticulture sector
4. Part 4: Consultation questions

Our submission

Horticulture New Zealand (HortNZ) thanks the Ministry for the Environment for the opportunity to submit on the proposal to reform industrial allocation in the New Zealand Emissions Trading Scheme (ETS).

We welcome any opportunity to work more closely with the Ministry for the Environment and to discuss our submission.

The details of HortNZ's submission and the outcomes we are seeking are set out later sections of our submission.

Executive Summary

Greenhouse growing is a resilient growing system important for domestic food supply. A rapidly increasing ETS price is beginning to hinder the transition to low carbon fuels by reducing both the availability of cash and confidence to reinvest, and the sector is at imminent risk. The review of industrial allocation, and changes to eligibility, has the potential to significantly impact greenhouse growers who are exposed to the ETS price through heating their greenhouses to achieve optimal production conditions.

Growers have become more efficient with their energy use since the ETS was introduced and have been actively investigating and investing in emissions reduction and improving energy intensity. However barriers remain to transition to low carbon fuels. Long term thinking, and support, is needed to develop suitable low carbon energy systems for covered crop growers.

Review of the approach to industrial allocation

We welcome the opportunity to reconsider the future of industrial allocation. HortNZ, TomatoesNZ and Vegetables NZ are strongly of the view that industrial allocation (or an alternative) needs to include consideration of New Zealand's ability to continue supplying its own fresh healthy food for New Zealanders, using a method (greenhouses) that is more resilient to the challenges of climate change, and uses less land, water, and nutrients than traditional growing systems.

We support changes to industrial allocation where they make the system more effective at providing the support necessary for businesses to remain competitive until a transition is made to lower emissions fuels for heating.

However, primarily we consider there is a need to review the approach to industrial allocation to include wider considerations that:

- support New Zealand's progress towards meeting climate targets, while also safeguarding food security.
- aligns with supporting the sector to transition to a lower-emissions fuels.

Industrial allocation provides free units to growers based on their production volume, rather than on how much carbon they emit, which is designed to incentivise low emissions production. However, it does not consider that vegetables are highly perishable products that do not store and travel well, or that there are benefits to communities of sustaining local vegetable production in places where alternative fuels are not yet feasible.

Alternative approaches are warranted and should be considered

Continually rising ETS prices are not sustainable for the greenhouse sector.

We consider that an alternative approach is warranted for greenhouse horticulture in the NZ ETS, for the following reasons:

- Greenhouse growers are producing healthy, fresh (perishable) fruit and vegetables for New Zealanders, enabling year-round food supply and security for New Zealanders.
- Some crops are trade-exposed, however even those crops that are less so, still have constraints in passing on ETS prices.
- Greenhouse growing is an efficient growing system, provides resilience in domestic food supply and is resilient in a changing and more volatile climate.
- The sector is undertaking work with EECA on a decarbonisation plan to support and enable transition, however this takes time.

The Paris Agreement speaks to a 'fundamental priority of safeguarding food security' and action in a manner that does not threaten food production. It is important that New Zealand retains the ability to provide for our own fruit and vegetables – in terms of availability, but also affordability.

- Growers have been experiencing substantial cost increases, due to rapidly rising ETS costs - for example the NZU price has doubled, reaching $65 (on the secondary market) in the last year.
- Rising produce costs contribute to food insecurity in New Zealand.
- There is a high risk that this (compounded by other energy supply/security challenges) will result in growers exiting the market, which will mean New Zealand will need to meet demand by importing (e.g from Australia), resulting in carbon leakage.

We strongly support MfE considering alternative mechanisms, to not only address the risk of climate leakage, but also alternative mechanisms of assisting New Zealand to meet it's climate targets for the greenhouse industry.

We are open to discussing this further and being part of the solution.

HortNZ considers that the review of industrial allocation needs to be considered in the context of supporting the greenhouse sector to transition to low carbon fuel, to enable these growers to continue to grow healthy produce for New Zealanders.

We consider the following options should be evaluated:

- Allocation for greenhouse growing which aligns to the 95% allocation provided for the rest of the agriculture sector under He Waka Eke Noa
- Upfront investment in supporting the sector to transition to low carbon fuels (including through supporting supply) to negate the need for industrial allocation for our sector
- A threshold and/or exemption approach for greenhouse growing.

Ultimately there is a need for a system-wide approach that enables the sector time to transition and certainty as to the options for transition, otherwise emissions reductions (that will result due to the exit of growers) will result in less vegetable consumption and carbon leakage.

PART 1

HortNZ's Role

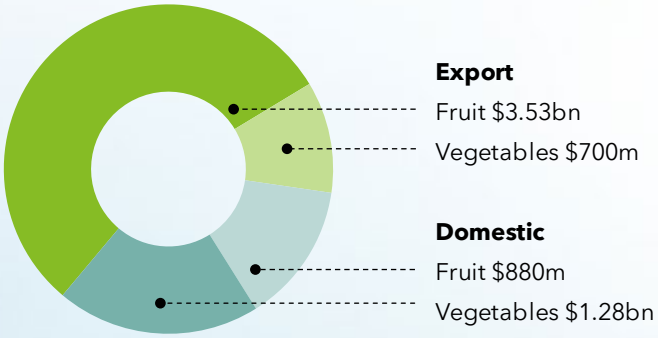
Background to HortNZ

HortNZ represents the interests of 6000 commercial fruit and vegetable growers in New Zealand, who grow around 100 different crop types and employ over 60,000 workers.

There is approximately 120,000 hectares of horticultural land in New Zealand - approximately 80,000 ha of this is fruit and vegetables. The remaining 40,000 ha is primarily made up of wine grapes and hops, which HortNZ does not represent.

It is not just the economic benefits associated with horticultural production that are important. The rural economy supports rural communities and rural production defines much of the rural landscape. Food production values provide a platform for long term sustainability of communities, through the provision of food security.

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.



Industry value $6.39bn
Total exports $4.23bn
Total domestic $2.16bn

This is a joint submission with TomatoesNZ and Vegetables NZ.

- Vegetables New Zealand Incorporated represents the interests of capsicum, chilli, cucumber, eggplant, lettuce, sprouted beans, witloof, and courgette growers.
- Tomatoes NZ represent fresh tomato growers.

PART 2

Introduction and context

The review of industrial allocation (and changes to eligibility) has the potential to significantly impact producers of tomatoes, cucumbers and capsicums (who are currently eligible for industrial allocation). It also has implications for the wider industry – who are currently not eligible for industrial allocation but may be in the future.

We welcome the opportunity to reconsider the future of industrial allocation and see an opportunity for alternatives which better support transition to a low emissions economy (and social, economic and environmental outcomes).

HortNZ's submissions on climate change policy (with specific regard to process heat) have sought that the Government provides support to enable transition away from fossil fuels, rather than solely relying on private sector, R&D investment or regulatory instruments – we consider that the review of the approach to industrial allocation (IA) has a role in supporting this for greenhouse growing sector.

1. Industry context

1.1. Overview of the covered crop sector

Greenhouse growing uses techniques not used in other cropping systems such as CO2 enrichment, soilless cultivation and heating. Greenhouse vegetables are grown year-round in a relatively stable, controlled environment with optimal growing conditions that offer the ability to produce a lot of vegetables in a sustainable way to feed our growing population.

A number of vegetable crops are grown indoors, in greenhouse structures – for example, capsicum, chilli, courgette, cucumber, eggplant, lettuce, sprouted beans, tomato, and witloof. The majority of these crops are heated.

There are also some crops that are grown under cover (but not heated) in either semi or fully enclosed structures for example, several berry varieties.

This submission hereafter refers to 'greenhouse growing' and/or 'greenhouse crops' in reference to crops which are grown in fully enclosed controlled environments, within a greenhouse structure.

1.1.1. EXTENT OF THE GREENHOUSE GROWING SECTOR

There are approximately 256 hectares of greenhouse crops in New Zealand (based on 2017 Agricultural Production Statistics data). Greenhouse growing is dispersed throughout New Zealand. In the North Island, growers are predominately located in the Auckland and Waikato regions, and in the South Island, predominately in Tasman, Marlborough and Canterbury.

In New Zealand, there are approximately 125 fresh tomato growers (almost all of whom grow in greenhouses) and approximately 120 greenhouse growers of crops, including capsicums, eggplants, cucumbers, lettuces, chillies and herbs.

1.1.2. ECONOMIC CONTRIBUTION OF GREENHOUSE GROWING

A 2018 report by NZIER evaluating the contribution of the covered (greenhouse) vegetable crop industries to New Zealand found:

- Gross output (or turnover) of $295 million
- Contribution to GDP of $120 million
- 2,400 jobs
- Exports of $35-$40 million per year
- Spending of $34.3 million on heating (including electricity, coal, gas)
- This is an important industry for New Zealand, attracting stable jobs and skills in a growing market for covered crop products. It makes important contributions to GDP and general wellbeing through the employment it provides, exports it makes, and an increased use of technology
- It is a stable and growing industry which provides a significant contribution towards diversifying the New Zealand economy
- Helps to diversify the revenue sources for companies involved in agriculture and horticultural industries

1.1.3. USE OF HEAT IN GREENHOUSE GROWING SYSTEMS

In New Zealand, commercial tomatoes, capsicum and cucumbers can only be grown outdoors for a short summer window in regions where there is enough heat ripen. Therefore, almost all of the fresh tomatoes, capsicums and cucumbers eaten by New Zealand consumers are grown in greenhouses.

A 2020 industry survey of greenhouse vegetable growers conducted by Tomatoes New Zealand and Vegetables NZ indicates that, of the respondents, 72% of the greenhouses (representing 95% of the greenhouse area accounted for in the survey) were heated, indicating that almost all larger operations are heated.

The same survey also indicated that the most common form of greenhouse heating is natural gas (62% of the heated area of survey respondents), followed by coal (15%). There were regional differences in fuel source, for example natural gas was limited to the mid and upper North Island (there is no reticulated gas network in the South Island).

EECA's energy end use data base indicates that amongst low and intermediate temp heat users (using boiler systems for heat/cooling) for 2019, indoor cropping accounted for 9.7% of coal use and 4.3% of natural gas use.[1]

Unheated greenhouses make up less than 4% of the production area and do not produce through the coldest winter months.[2]

[1] Energy end use database, accessed from EECA's website.
[2] Lumen (2020). Tomatoes New Zealand Grower Survey November 2020

Importance of heat for greenhouse growing systems

Heating is important for the viability of greenhouse vegetable production – by enabling year-round production and to grow a quality product.

Heating has multiple functions. As well as determining the rate of photosynthesis, fruit set and fruit ripening, temperature regulates plant growth rate by driving transpiration rates and photosynthesis rates. Heating also allows the grower to manage relative humidity in the greenhouse, reducing the onset and spread of diseases, reducing the use of agrichemicals and increasing the fruit/plant quality.

Without heating, a controlled environment is not achieved, fruit/plant quality is poorer, losses are greater, and product cannot be grown in winter.

Due to the fresh, highly perishable nature of greenhouse-grown vegetables, capturing the winter value of produce is essential to the greenhouse production model. Winter returns (due to reduced supply) are at a level that sustains growers through the summer months when fruit prices frequently do not cover costs. This is important for realising the benefits of the capital infrastructure of a greenhouse (with a new operation building cost starting at $2M per hectare).

Year-round production is crucial because a high seasonality level results in lost market share at the end of every peak season as volumes drop and prices increase. That market share, which has been lost during the low-season to alternative products or imports, has to be regained the following peak season, which often does not happen fast enough, resulting in prices that do not cover grower's costs. Year-round production helps to even out the prices throughout the year, enabling continuity of supply and skilled workforce retainment which benefits both growers and consumers.

Due to resource efficiency, greenhouse production can also offset shortages caused by weather events that affect outdoor grown crops, for example flooding or drought.

It is the 'when' that crops are grown for that matters for covered crop operation as most are responsible for supplying fresh New Zealand grown produce in the off-season or when weather events affect outdoor crops.

Carbon dioxide enrichment

An additional benefit of the use of (some) fossil fuels for heating, is the supply of carbon dioxide which is captured and distributed to the crop to enhance crop growth, by increasing photosynthesis rates.

Growers using natural gas as their fuel source run boilers at day time to distribute the CO2 from the gas heating process into the greenhouse. The heat from this is stored using insulated buffer tank (that is then used for heating overnight).

Too little CO2 results in slowed plant growth and reduced yields. CO2 enrichment is used as a supplement on bright days as in the enclosed environment the plants consume the CO2 rapidly, CO2 drops causing photosynthesis rates to drop. Some growers buy in tanks of supplementary CO2, especially those using non-gas heating sources.

1.1.4. CONTRIBUTION TO DOMESTIC FOOD SUPPLY

Greenhouse growing is an integral part of New Zealand's food system, enabling New Zealanders to access freshly grown vegetables from a local supplier throughout the year; provides resilience within the domestic food system.

Most vegetables grown in greenhouses in New Zealand are for domestic consumption; the main greenhouse-grown export crop is capsicums.

These vegetables are stable foods for New Zealanders. Fresh tomato retail sales (excluding those used by food service restaurants/cafes and processed tomato products), for the year ended June 2019 was $109m – more than any other fresh vegetable or fruit except for Bananas at $145m. (Statistics NZ Household Economic survey). Potatoes at $100.6m had the next highest spend after tomatoes. Cucumber spend was $34.8m, and fresh capsicum and chillies $47m.

Some of these crops also have an export component. This helps to support the viability of these businesses over the year when excess seasonal summer supply exceeds local demand at times when wholesale prices fall below the costs of goods sold.

Tomatoes

For the year ending 31 March 2020, 3,701T of fresh tomatoes (with an FOB value of $12.2 million) were exported, representing 9% of the industry farm gate value. During the same period, 175T of fresh tomatoes were imported from Australia.[3]

Cucumber

The 'Potential for emissions leakage from selected industries in the ETS' report prepared for MfE states that cucumbers are largely produced for a domestic market - imports (in 2017 to 2019 FY's) were equivalent to approximately 1% of production and highly seasonal (at times when NZ retail prices are high); there is some export of New Zealand grown cucumbers (with export volumes trending downwards).[4]

Capsicum

In 2020, the domestic sales value (fob) was $35 million for capsicums, compared to $24.7 million from exports.[5] The main export markets for capsicums are Japan (81% by quantity in 2020), Australia (15%) and the Pacific Islands[6] (4%).[7] Export volumes are highest in the summer months (Nov – Feb) and lowest over winter (June – August).

Other crops

The other indoor crops (e.g lettuce, eggplant) are typically grown for the domestic market and currently fall outside of the industrial allocation scheme.

---

[3] Pers Comms, Tomatoes NZ (2021)
[4] Potential for emissions leakage from selected industries in the ETS (January 2021). Resource Economics Limited.
[5] Freshfacts 2020.
[6] Sum of exports to Cook Islands, Fiji, French Polynesia, Kiribati, Marshall Islands, New Caledonia, Niue, Palau, Samoa, American Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu, Wallis and Futuna.
[7] Statistics New Zealand data on exports of 'Vegetables; fruits of the genus capsicum or of the genus pimenta, fresh or chilled' for 2020, accessed from Infoshare.

Eggplant was highlighted in a recent Landcare policy brief as being at risk for food security (with approximately 1kt produced and ~0.8 kt imported), recommending promotion of greater domestic production.[8]

1.2. Coverage of the NZ ETS

1.2.1. GREENHOUSE GROWING

Greenhouse crops (grown using heating) are exposed to the ETS price through costs that are passed through from their use of fuel or electricity.

Currently, three horticultural crops (fresh tomatoes, fresh cucumbers, and fresh capsicums) are eligible to receive industrial allocation, as moderately emissions intensive trade exposed (EITE).

There are a number of other crops (which are exposed to ETS costs via their fuel costs for heating that are not eligible for industrial allocation – for example, lettuce, herbs, leafy greens, chillies, eggplants – these crops pay the full ETS price, where they are heated. Based on the area distribution between crops (again using APS 2017 data), 65% of indoor vegetable growing area (i.e tomatoes, cucumbers, capsicums) was eligible for industrial allocation.

1.2.2. REST OF THE HORTICULTURE INDUSTRY

Outside of ETS cost via fuels for heating - ETS costs are also present for transport, refrigeration more broadly throughout the sector.

Currently agricultural emissions do not face any ETS costs – this is being addressed through He Waka Eke Noa, or alternatively will become part of the ETS after 2025, at which time they will have 95% free allocation. We acknowledge that this is outside the scope of this consultation.

2. Impacts of rising ETS costs for the greenhouse growing sector

Energy is the second highest single input cost for heated greenhouses (~30%), following closely behind wages.

Production of vegetables and other crops in greenhouses use energy for the control of temperature and humidity (heating), as well as for CO2 enrichment and (rarely in New Zealand) supplementary crop lighting. The energy use depends on the location, climate, greenhouse specifics, crop, temperature settings, and other variables.

A high-level qualitative assessment undertaken by NZIER in 2020 estimated that for the covered crop industry, at an ETS price of $50/t carbon (with current technologies), growers will not be able to provide the volume or range that they produce and the industry will be significantly downsized. It notes that the ETS is already having 'a dramatic effect' on the covered crops industry noting that 'many

[8] https://www.landcareresearch.co.nz/uploads/public/Publications/Policy-Briefing-Guidance-Papers/Policy-brief-27_Rethinking-NZs-food-security.pdf

growers believe that they are caught in a bind between rising energy costs and an inability to raise prices in a competitive market'.

Growers have been experiencing substantial cost increases, for example at an NZU price of $25, we calculate that the average net cost of the ETS (after allocation) on heating costs for a South Island tomato grower was $26,693 per hectare. Whereas, at an NZU price of $50, this net cost has increased to $53,386 per hectare. This highlights the scale of increases some growers are experiencing.

Policy direction, in addition to steadily rising ETS costs that are being experienced, strongly signals that the ETS price will continue to rise. For example, changes to the ETS last year that introduced price controls; the Climate Change Commission's Advice to Government stating that it needs to rise in order to align with emissions budgets; and recently announced changes to increase the cost containment reserve to $70).

"Last week, the carbon price hit $65 per ton. This works out at $3.50 per GJ of gas (18.5 GJ of gas per ton of CO2). That's roughly $53,000 per ha per annum! give or take."

Experience of a greenhouse grower.

The price has also risen faster than has been expected – for example, in recent auctions the cost containment reserve was exceeded, this is contributing to the impacts on growers.

High ETS costs risk forcing some greenhouse growers out of business and limits the ability for capital investment, which in turn, limits potential to transition to lower emissions fuels because this requires significant investment.

Impacts are already being seen in the industry – for example;

- compared to last winter some tomato growers have reduced their planted area or exited the sector, and this reduced supply is being reflected in higher prices over winter this year (and these are staying higher for longer).
- many leafy green growers have seen a decrease in supply and increase in disease, because they have had to turn off boilers or reduce their use.

The high prices, and large fluctuations of price (as per Figure 1 below, summer 2020-21 also saw the lowest ever prices for tomatoes due to Covid disruptions), are not sustainable for a number of reasons; including:

- Consumers are turned off the product, and instead buy less healthy, often imported alternatives, not just in winter but all year round.
- High prices will encourage more imports from Australia in winter, which face no ETS or carbon tax and can sell for lower prices than NZ tomatoes.
- Summer prices become unsustainably low as growers move away from winter production and summer supply increases
- Stable and predictable prices are preferred by growers and retailers and consumers alike, as it results in predictability and consistency of purchasing, leading to the ability of growers to re-invest in their businesses, including in improving energy efficiency and fuel switching.

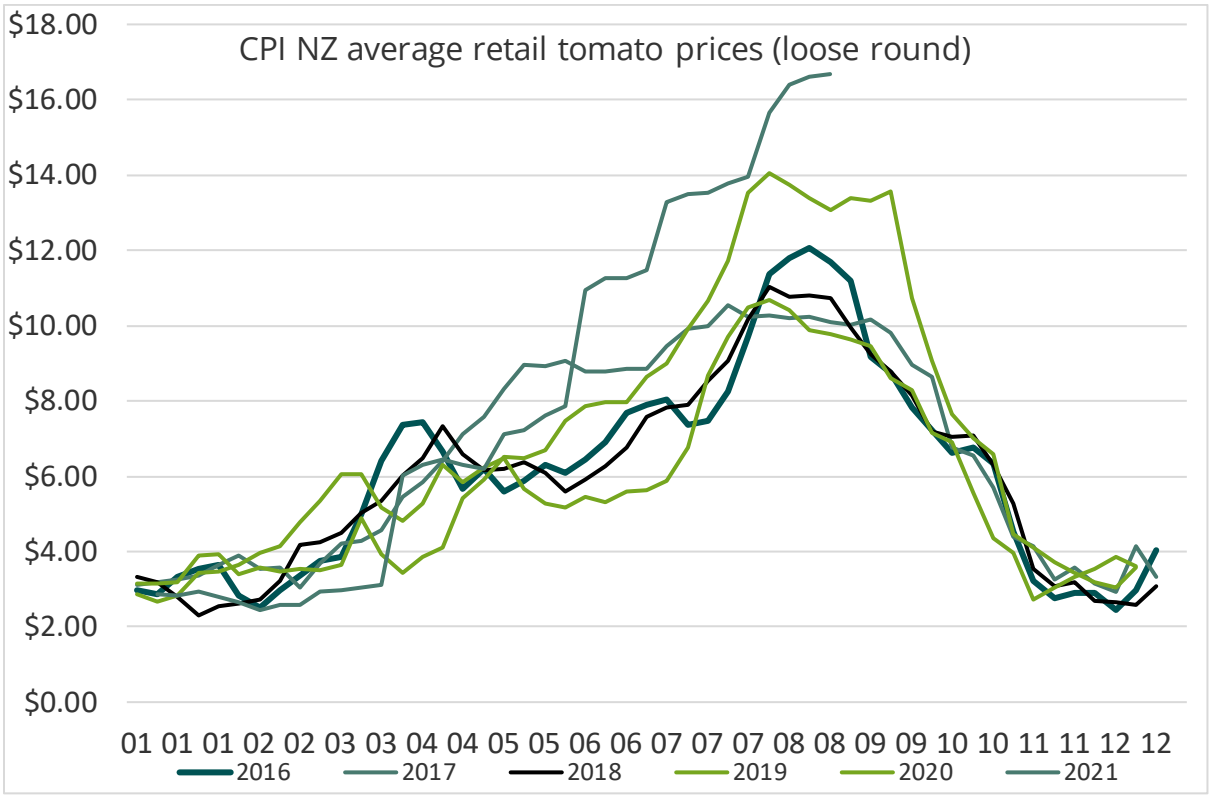


Figure 1: CPI Average retail tomato (loose round) prices (2016 – August 2021). Source: StatsNZ

There is a very real risk that more growers will exit in the within the next 12 months, and their production will not be replaced, because of very high energy prices , lack of viable, secure, alternative energy sources, along with other rising input cost. In the near future these vegetables will not be grown in New Zealand for substantial periods of the year and instead be imported, which we believe would have negative social and economic consequences. For example, people would no longer have access to locally grown produce, which is fresher and more readily available from a range of suppliers than imports; biosecurity risks will increase from the imported products; jobs and export income will be lost; and New Zealand's own food security (ability to provide its own fresh vegetables) reduced.

Additionally, those countries (notably Australia) that the produce is imported from are very unlikely to face the same carbon charges that our growers face; they may pay a different price; or they may produce with much higher emissions than NZ growers – i.e. the potential for Carbon Leakage.

Loss of South Island growers (who face higher costs) would result in increased reliance on other growing areas (which has resilience implications), reduced capability within New Zealand and increased transport related emissions.

2.1. Resilience and mental health

Rapidly increasing prices and uncertain energy supply markets are taking a toll on the mental health of growers. Regulation to focus on negative aspects – it is also important to recognise the positive contribution the sector makes in terms of producing of healthy food.

3. Role greenhouse growing systems have to play in a low emissions future

In our view, greenhouse growing is a growing system which we want to retain (and expand) in New Zealand – notwithstanding the need to move away from use of fossil fuels – this is because:

- **Efficient growing system** – requires considerably less water per unit of output, and produces more consistent, high-quality products. For example, tomatoes grown in a new high-tech greenhouse can produce 100 kg per m^2 per year, equal to 1,000 tons per hectare per year. This is 10 to 20 times more than the production of any field-grown crop.[9] In addition, the greenhouse crop will use at least four times less water than the outdoor crop.[10] The closed systems also allow for controlled and recycled inputs such as water and nutrients, with minimal (and controlled) discharges.
- **Resilience in domestic food supply** – Greenhouse growing provides resilience within the domestic food system and is important for risk management at a national level. The greenhouse industry plays an important role in evening out market supply issues in shoulder and off seasons. This is particularly important when there are adverse weather events that impact on the few areas in the country where there is winter production of certain vegetables.
- **Resilient system in a more volatile climate (climate adaptation)** – Global trends suggest that covered cropping will have an increasingly important role to play in feeding people. An increase in covered cropping will be essential to adapt the food production system to the changing, more volatile world climate while still producing enough food in a way that also uses less water and nutrients and mitigates the risks associated with unpredictable climatic events. A 2019 Intergovernmental Panel on Climate Change report into land use stated "*The stability of food supply is projected to decrease as the magnitude and frequency of extreme weather events that disrupt food chains increases*".[11] Covered cropping can reliably deliver high yields of quality produce using less land and water.

Research has illustrated the connection between eating patterns, climate change and health outcomes finding that eating more plant-based foods and minimising food waste were one of the most important ways individuals could reduce their personal climate footprint, while also having health gains and health system savings[12]. This research reported annual diet-related emissions reductions of between 4 percent (following New Zealand Dietary Guidelines) to 42 per cent (wastefree vegan diet), the latter being equivalent to one-fifth of the current

[9] Elly Nederhoff, Crophouse Ltd. March 2021
[10] The Futuristic Farms That Will Feed the World. August 2019
[11] IPCC, 2019: Summary for Policymakers. In: Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems
[12] 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

emissions reduction needed to meet New Zealand's commitment under the Paris Climate Agreement.

In this context it would be counterproductive to restrict production of plant foods. This research echoes the findings of the Eat-Lancet Commission, that food is the single strongest lever to optimize human health and environmental sustainability and without action, the world risks failing to meet the United Nations Sustainable Development Goals and the Paris Agreement[13].

A policy environment that enables the transition of the greenhouse sector to low emissions fuels, without businesses becoming uneconomic and closing is required.

4. Transition to a low emissions economy

HortNZ considers that the transition towards New Zealand's 2050 climate target needs to provide for a realistic and fair transition for food production, taking into consideration environmental, social and economic impacts, including global emissions and food security.

We are of the view that the covered crop industry does need to transition to renewable energy sources and that, over time, this will be possible. However, sufficient time for the technology and alternatives becoming available and economically viable to support this outcome will be required. There also needs to be consideration of the 'life' of current assets – there is a risk of stranded assets if the transition is to fast.

4.1. Challenges/barriers to transition

There are challenges for transition to low emission fuels for heating in the greenhouse sector. The key barriers to change include economic reasons (transition is very capital intensive, and operating costs are high) and energy security limitations (for biomass and electricity in particular).

> *"At one site we explored changing from waste oil to a renewable resource. Electricity was significantly higher capex and opex, so was not feasible. Biomass had very slightly lower opex compared to waste oil, but still required $4.2m in capex to transition. Even with significant co-funding to change, this was still economically unfeasible to be competitive and change in today's tomato market."*
>
> Example of the experience of a greenhouse grower.

Tomatoes New Zealand and Vegetables New Zealand are in the early stages of a decarbonisation plan in partnership with EECA – this will provide better information on the pathway forward than what is known currently.

The horticulture sector needs investment in technology that will enable growers to transition the heating of these growing systems to economically viable, low emissions, alternative heating systems. Equitable support for indoor growers, both large and small, to access energy saving technology and assistance with capital for

[13] Eat-Lancet. (2019). Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems. The Lancet.

energy conversions, energy saving measures and alternative fuel supply initiatives from Government is vital. Growers have been paying the carbon tax on fuels (some without industrial allocation), but have not had sufficient support/viable options to enable fuel switching.

Transition isn't easy and takes time, for example:

- The Netherlands, world leaders in this area, are seeking to achieve a climate-neutral greenhouse horticulture sector by 2040.[14] This is supported by transition projects such as the capture of carbon dioxide and residual heat from other industrial sources for reuse as an input in greenhouse horticulture in spatial clusters; and a 'Greenhouse as a Source of Energy' programme.
- The Dutch greenhouse industry is ten years into energy transition and while geothermal, biofuels, solar, sustainable electricity and sustainable heat are energy sources that are used, however 90% remains natural gas.[15]

Some of the costs of reducing emissions that will be borne by the horticulture sector (via the ETS or otherwise) will either be passed on to consumers, or result in significantly reduced domestic supply. For example, most of the vegetables grown in New Zealand are for domestic consumption, and increasing costs of vegetable production may threaten the ability of growers to continue to provide fresh affordable vegetables for New Zealanders. In addition, New Zealand is too remote to import most fresh vegetables, except by air-freight, which can only provide for a fraction of demand and has a high carbon footprint.

4.2. Limitations of existing support structures

We acknowledge there is some support available for growers to invest in new technology – however this does not provide enough support across the industry, and in particular for small to medium growers.

The Government Investment in Decarbonising Industry (GIDI) fund, providing contestable co-investment to support industrial process heat decarbonisation is an example of this. This fund is limited to projects that have a total capital cost of greater than $500k, with co-investment to a maximum of 50% (and not exceeding $5 million). The funding rounds are considered too short for most growers to tap into and the majority of the industry are smaller growers that do not fit the GIDI fund requirements. As such, inequitable policy outcomes impact on market competitiveness.

[14] National Climate Agreement 2019 – Accessed: https://www.government.nl/documents/reports/2019/06/28/climate-agreement

[15] Presentation by Elly Nederhoff, Crophouse Ltd. March 2021.

PART 3

Industrial allocation in the ETS

5. Current state industrial allocation for horticultural EITE activities

As noted above – growers of fresh tomatoes, fresh cucumbers and fresh capsicums are eligible for industrial allocation (60%, and declining due to recent amendments introducing phase out) as moderately emissions intensive activities.

In 2019, industrial allocations were claimed by:

- 20 growers of fresh tomatoes, collectively 49,837 NZUs
- 9 growers of fresh cucumbers, collectively 27,940 NZUs
- 10 growers of fresh capsicums, collectively 29,466 NZUs

Collectively, this accounted for 1.3% of NZUs allocated (via industrial allocation) in 2019 (0.6%, 0.34% and 0.36% respectively).[16]

Figures 1 and 2 show the trends between 2010 and 2019 for these crops.

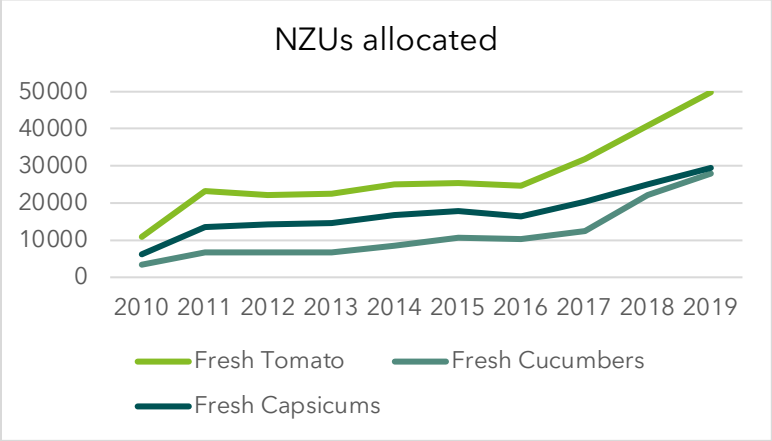


Figure 2: Industrial allocation data – NZUs allocated[17]

[16] Based on data published by the EPA, at https://www.epa.govt.nz/industry-areas/emissions-trading-scheme/industrial-allocations/decisions/

[17] Ibid.

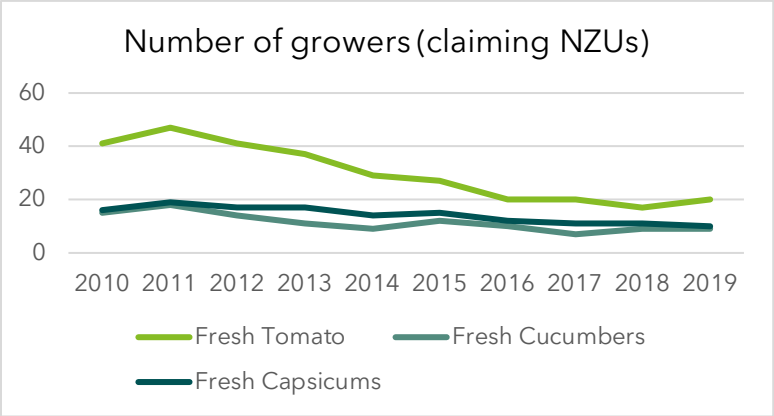


Figure 3: Industrial allocation data Number of growers claiming NZUs[18]

As the number of NZUs allocated is based on production volume, the figures above suggest that production volumes of these crops have gone up, but the market has consolidated (there are fewer growers). This is consistent with industry data.

The data also indicates that growers can (and do) convert between crops i.e some are not claiming industrial allocation year-on-year for each respective crop.

Industrial allocation reduces the cost of the NZ ETS for these producers – to a greater or lesser degree depending on their fuel source, heating requirements (both of which are dependent on geographical location) and production levels.

Industrial Allocation currently paid under the scheme has reduced the impact of the ETS price for eligible growers, but it has not driven transition across the industry. Crops are grown in different parts of NZ to meet local market demand. Growers logically cannot shift to locations with lower emissions fuel sources e.g. from South Island coal to North Island gas or geothermal, as was suggested in the 'Potential for emissions leakage from selected industries in the ETS' report (i.e. that cucumber production might just shift within New Zealand, rather than to international producers), while still providing a local food supply. There is also significant investment tied up in existing infrastructure.

5.1. Recent data collection for cucumbers

We note the following about the structure of industrial allocation:

- Industrial allocation in the ETS was established to incentivize carbon efficient production (including for example, if a grower converted to biomass but the cost of that fuel is higher, it supports that conversion).
- The 60% allocation (for moderate EITE) is across the industry, not each individual grower. It was always set up to 'reward' some growers more than others due to the point above.

We have concerns about the data collection that occurred for cucumbers – in terms of the assumptions made (particularly relating to import risk/trade exposure) and the representativeness of the industry. The figures suggested do

[18] Ibid.

not align with industry data on energy efficiency improvements (i.e circa. 40% between 2004 and 2007, as noted below).

We also note that the data collection questions/format did not align with how that data is typically collated/recorded by growers, requiring interpretation. This may have resulted in variable quality/accuracy of the data collected. The industry would like to assist with making this process more accessible to growers in the future.

6. Emission and energy intensity improvements in the sector

In 2017, a TomatoesNZ and Vegetable NZ survey of covered vegetable crop growers (including tomatoes, capsicums and cucumbers) of their energy use demonstrates that since the previous survey undertaken in 2004, indicated that:[19]

- Nationally, energy intensity had remained virtually unchanged with just a 5% increase since 2004, going from 1,360 MJ/m2 to 1,430 MJ/m^2;
- During that same period, yields increased across standard tomatoes (large loose/truss) (28%), capsicums (8%) and cucumbers (41%);
- Energy use is influenced by management, regional location, the type of greenhouse, greenhouse age and the type of crop being grown. Average energy use in the North Island is 1,310 MJ/m^2 which is 26% less than in the South Island at 1,790 MJ/m^2.

Calculating the carbon footprint of tomatoes and capsicums from the 2017 survey and comparing it to the 2004 survey, we found that:

- The NZ weighted average standard tomatoes footprint decreased by 21% from 2,610 gCO2eq/kg marketed fruit to 2,050 gCO2eq/kg marketed fruit. This reflects the same energy intensity but 28% higher yields.
- Similarly, the carbon footprint of capsicums decreased by 7%, reflecting an 8% increase in yield, from 3,908 gCO2eq/kg marketed fruit to 3,640 gCO2eq/kg marketed fruit.

Growers have become more efficient with their energy use and investing in opportunities to reduce their emissions and make energy intensity improvements.

Two case study examples are explained in **Appendix A**:

1. South Island Grower – thermal screens, consolidation & better use of boilers, transition to biomass
2. NZ Gourmet – use of wind and solar at Waiuku glasshouses.

We urge decision makers to, in the review of industrial allocation, recognise the progress that the sector has made and consider that the review of allocation settings should not have the effect of penalising efficiency gains.

[19] NZ Greenhouse Energy Use and Waste Survey 2017

These case studies emphasise that long term thinking is needed to develop suitable systems for covered crop growers.

7. Transition away from fossil fuels

For the most part, the ETS has not supported or driven transition to low carbon fuels to-date. One of the key reasons for this is the limited options for transition that exist – the industry is actively working in this space to better understand the opportunities/pathway.

A consider relevant to the ETS is cost - some growers are in the situation where due to high input costs, they do not have the money to invest in capital projects.

The New Zealand greenhouse sector has aging infrastructure, much of which is due for replacement in the next 10 years. Reinvestment is an opportunity to build more efficient structures, however if production costs are too high, it might not be viable to make this investment (and growers may choose to exit instead).

8. Current design of industrial allocation is not well suited to the greenhouse horticulture sector

Currently industrial allocation is set up to manage emissions leakage – recognising that NZ ETS costs might affect the international competitiveness of some businesses (i.e trade-exposed businesses are unable to pass on increased costs to consumers because they are competing with businesses in other countries).

The NZ ETS is intended to encourage the use of low emissions technologies and fuels by imposing costs. Industrial allocation reduces those costs for some industrial activities to avoid emissions leakage.[20]

In theory, increasing ETS costs would act as a price signal that is either passed on to consumers resulting in a higher cost product (providing an incentive for consumers to purchase lower carbon products), and/or provide a price driver for producers to reduce carbon emissions.

Growers are 'price takers'

Growers are generally 'price-takers'. The ability to pass on higher production costs to consumers is limited. For example, research indicates that families in New Zealand living in more deprived areas substitute fruit and vegetables with cheaper energy-dense nutrient-poor products when there are increases in fruit and vegetable prices[21].

The recent draft report by the Commerce Commission on the retail grocery sector indicates that major grocery retailers are a key route to market for many suppliers (between them an estimated 80-90% of the retail grocery market) and that competition does not appear to be working well for suppliers to the major grocery

[20] https://environment.govt.nz/what-government-is-doing/key-initiatives/ets/participating-in-the-nz-ets/overview-industrial-allocation/#introduction-to-industrial-allocation

[21] Rush, E., Savila, F., Jalili-Moghaddam, S., & Amoah, I. (2018). Vegetables: New Zealand Children Are Not Eating Enough. *Front. Nutr.* https://www.frontiersin.org/articles/10.3389/fnut.2018.00134/full

retailers. The report highlights that most suppliers have limited ability to negotiate with the major grocery retailers. [22]

An additional factor, is the perishability of fresh produce. The same Commerce Commission draft report noted that suppliers of some perishable products appear to be particularly vulnerable when dealing with grocery retailers, and included the following quote from the submission of T&G Fresh:

"When fresh produce is grown, it must be sold quickly because of its perishability. Unlike other industries, in fresh produce you can't pause production because demand is low or pricing isn't so good. You are at the mercy of mother nature, the market, and prices change daily due to supply and consumer demand."

While prices of fruit and vegetables may increase, this does not mean the growers returns are increasing. A 2019 report by NZIER on the farm share of retail prices, stated:

> *"For food, particularly perishable food, rising prices do not necessarily reflect farmers receiving increasing returns. As an example, higher prices can reflect increasing input costs such as transport costs being passed on to consumers."* [23]

The same report also noted the volatility of fruit and vegetables prices, with a lot of supply and price variation due to weather conditions.

Growers need to produce all-year around for economic viability

Greenhouse growers need to produce fruit/vegetables all year to get a return on their infrastructure investment, continuity of their supply relationships and skilled staffing and retainment costs. Growers make their profit in spring and autumn when they can grow reasonable quantities of produce and demand (and pricing) holds up well. During summer there is an over production which drives down prices due to oversupply in the market, and in the winter the high costs and lower volume of fruit result in no money being made by growers.

Appendix B includes graphs of the import (quantity), export (quantity) and price index by month for 2018 for tomatoes, capsicum, cucumber and lettuce.

This indicates that for all four of these crops:

- Prices (monthly weighted average prices, per kg) peak over the winter months (approx. May – August) and are lowest over the summer months;
- The greatest volume of imports coincides with this winter price peak;
- Exports from New Zealand occur during the summer months (when the price is lower) rather than during the winter price peak period; this was most prominent in tomatoes and capsicums (as there is little export of lettuce and cucumber).

Domestic consumption is sensitive to price

[22] Market study into the retail grocery sector – Draft Report (29 July 2021). Commerce Commission.
[23] NZIER (2019). Farm Share of Retail Prices.

There is a direct linkage between the price of fruit and vegetables and the volume sold – when prices are low (in summer) consumption is at its peak, and conversely when the price peaks in winter, consumption reduces.

"Figures from the HES [Household Economic Survey] *suggest households buy fewer tomatoes when they are out of season and available at higher prices, and more tomatoes when they are in season and available at lower prices. The result of this is that New Zealanders' spending on fresh tomatoes actually tends to remain at similar levels throughout the year, whatever the season"* – StatsNZ article.[24]

Imports are also sensitive to market changes

For example, for fresh tomatoes, at present imports are low (refer Figure 3), because the New Zealand market is fully supplied locally, however that could rapidly change.

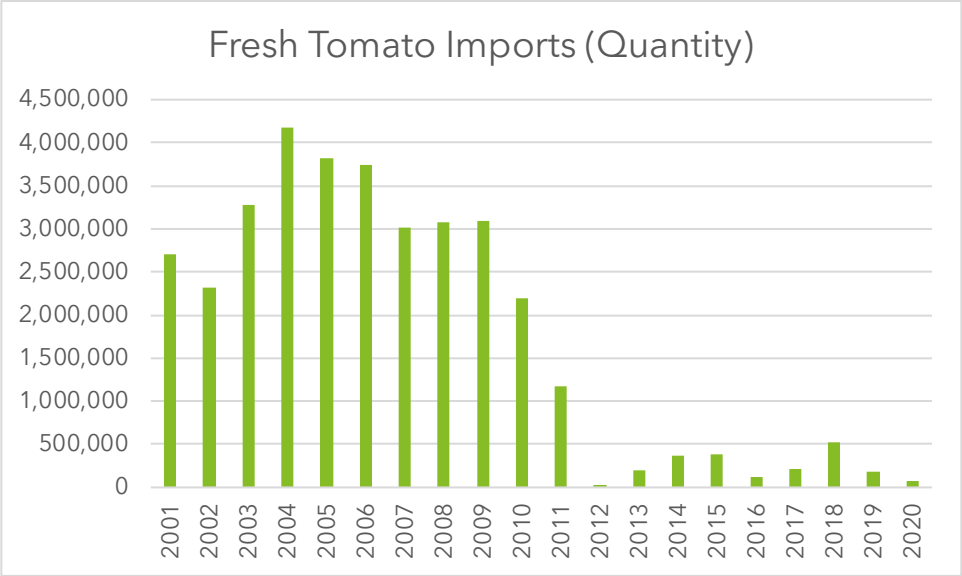


Figure 4: Import data (quantity, kgs) for Tomatoes (2001 – 2020)

Records of tomato statistics indicates how New Zealand production volumes influence import volumes.

- Pre-2011, few New Zealand tomato growers produced in winter. In 2011, Australian fresh tomato imports were paused when the Australian authorities banned the use of dimethoate (used as biosecurity measure for Fruit Fly).
- During this period NZ growers adjusted their production practices to supply more tomatoes in winter. They were able to do this because they were receiving a better price for their product in winter (where previously, the Australian imports kept the price down so it was less economic for growers to compete).
- Imports were reinstated in 2013 with the introduction of irradiation as the Fruit Fly quarantine treatment. However import volumes have never recovered. New Zealand growers are now producing a more stable year-

[24] 'Red, ripe and really versatile: tracking tomato prices in the CPI'. Statistics New Zealand, 11 January 2012.

round supply Between 2011 and 2019 (until Covid disruptions) prices had become stable year-round, which is good for both growers and consumers.

If ETS pricing leads to a decrease in New Zealand production volumes and/or price increases, this would leave the sector vulnerable to carbon leakage from imports. As price increases and/or supply decreases, it eventually reaches a tipping point where local demand for the product is not being met and Australian imports[25] become a more attractive and economic proposition for New Zealand food service and food retailers. This is particularly so when domestic Australian prices are not subject to the same carbon price increases, because as Australian produce prices remain more static relative to NZ produce prices, Australian growers can get more for their produce if they export it to NZ than if they sell it domestically in Australia. Therefore, rising NZ produce prices will support movement of the production of these vegetables offshore to Australia, where the growers pay no carbon costs.

Outdoor growing land has been lost.

With the exception of process tomatoes in the Hawkes Bay, the outdoor fresh tomato growing industry is largely gone from NZ, and there is no guarantee it would return.

For example, Otaki was renowned for growing tomatoes (two million tomato plants were grown), and the area supplied over 90% of the North Island's requirements. At its peak, the Otaki District Commercial Growers Society has over 150 registered growers. The average size of the garden ranged from half an acre to 5 acres – this is why the land is fragmented, because it used to be possible to work off small sites. When the tomato industry went indoor, the outdoor tomato industry in Otaki became uneconomic. The small land parcels and urbanisation of Otaki meant that the smaller (0.5 to 5ha) blocks were no longer large enough for a viable horticulture business, and have been lost to urban and lifestyle development. In Otaki, there is now less than 10 growers still in operation, and of those, only two or three are supplying the central marketing system.[26]

Increased price of production could impact ability to supply domestic market

As has been touched on previously, growers mostly produce a domestic market – if production are to be profitable, thus will impact on vegetable supply.

Higher prices of produce result in less consumption of vegetables. If NZ producers are driven out of business by the carbon price NZ consumers would be likely to pay the imported price year around resulting in reduced consumption. The consumption data in **Appendix B**, clearly illustrates the link between consumption and price. A recent study undertaken By Otago University[27] has modelled the impact of increased on vegetable prices on health, and found increased prices results in reduced vegetable consumption, substitution with less healthy food, and measurable negative health impacts

[25] Fresh Tomatoes can presently only be imported from Australia.
[26] Yung, Andrew. 2020 Evidence for Plan Change 2 Horizons.
[27] Cleghorn, C. 2020: The health and health system cost impacts of increasing vegetables prices over time, University of Otago

PART 4

Consultation Questions

Criteria for assessing proposal

Response to specific consultation questions

Q. 1	Do you agree with the five criteria to assess the proposals in this consultation document? Why, or why not?

Support the criteria proposed – but consider additional criteria relating to food security and impact on ability to transition (which are discussed in more detail later in the submission) should also be included.

Proposed changes to allocation calcultations

General comments

We agree that there could be advantages in updating allocative baselines (to be more current).

There are also advantages to including a timeframe for future updates – as this will build additionally certainty (in respect of when baselines will be amended, although at the expense of certainty of the same allocative baseline for an indefinite period until future review) and keep the system current.

Updating baselines every year going forward would introduce a level of uncertainty which would outweigh any benefit gained, we would favour a five- or ten-year frequency for updating baselines.

Proposed changes to eligibility

General comments

In principle, HortNZ is not opposed to updating the eligibility base years, to be more current, and to introduce new emissions intensity thresholds for New Zealand industry if the benefits of such an approach outweigh the costs of developing these.

Response to specific consultation questions

Q. 9	Should more thresholds be added into the eligibility criteria? Why, or why not? How many would be appropriate?

We discuss in further detail below, that we consider food security and support to transition, are both criteria which we consider would be useful to add in.

It is also relevant to consider that few or no other countries charge carbon costs on fruit and vegetable production.

By providing IA by other crops that are below the current threshold, this would provide those users an opportunity to invest in transition, and provide a more equitable approach across the sector (compared to grants etc.).

Q. 10	Would a sliding scale threshold system better target eligibility and assistance? Why, or why not?

We support consideration of a 'sliding scale' approach – this would enable more targeted support (i.e more closely matched to need) and also negate the situation whereby a sector may be just below the threshold for moderate EITE – and therefore instead of being eligible for 60% industrial allocation receive 0%, where some allocation may be warranted and justified (even if a lesser amount e.g 30%).

Q. 11	Should the New Zealand EAF be used when determining eligibility? Why, or why not?

We have not done any impact on the analysis for growers – if this route is taken, this should be a consideration. Particularly in the future if conversion results in greater use of electricity (by greenhouse growers) to meet heating needs.

Q. 13	Should the trade exposure test be changed? Why, or why not?
Q. 14	What would be a more appropriate method to determine trade exposure?

We consider it would be useful to take into consideration not just 'current state' – but the risk of imports increasing, due to a rising price (attributable to increasing ETS costs) and/or if the NZ market was to shrink for that product whether this would result in import substitution. This is particularly relevant for fruit and vegetable production.

It should consider what carbon costs our direct international competitors face (i.e. few or no other countries charge carbon costs on food production), and other countries are also subsidising transition.

Other reforms to industrial allocation

Q. 15	Do you agree with the proposal to simplify the process to update allocative baselines, to reflect changes to emissions factors, EAF or other changes to methodology? Why, or why not?

The impact of this is unclear, without the detail it is hard to understand the practical implications.

New activities

Q. 17	Do you agree with the proposal to clarify the eligibility process for new activities? Why, or why not?

Yes, we support clarification of the process for new activities so that it is clearer. Use of the most recent activity data in the intensity test would seem a logical clarification (as opposed to being tied to historical baselines – whether or not this data exists).

The review could also consider a simplified system to access industrial allocations.

Q. 18	Should new activities be able to seek eligibility? Why, or why not?

Yes – we consider there should be the opportunity for new activities to seek eligibility for industrial allocation, within reason.

This is necessary to recognise:

- Situations may change – activities which may have not been eligible, may become eligible due to changing circumstances.
- New activities could bring benefits that align to other policy objectives (such as food security, freshwater management and climate adaptation).

Q. 19	Should there be any caveats on new activities seeking eligibility, such as proof of environmental benefits compared to existing activities?

Option 3 in the consultation document ('New activities can seek eligibility if they can prove environmental benefit') suggests that a new activity must demonstrate a positive environmental benefit compared to a competing activity – acknowledging that this could be complex and difficult (and costly) to determine.

This may be too narrow of a criteria in our view – depending on how widely the term environment was interpreted.

An additional consideration should also be alignment with other policy objectives and contribution to NZ's climate change goals and/or transition. We consider that there needs to be some flexibility, perhaps this could be achieved by having matters to consider with discretion left to the Minister, rather than prescriptive set criteria.

Reporting

Q. 20	Should firms that receive IA be required to report their emissions, revenue and production data annually? Why, or why not?
Q. 21	Would voluntary reporting be more appropriate, and still provide some oversight of leakage and over-allocation risk? Why, or why not?

We consider that an annual requirement for data collection creates an unnecessary administrative data burden, and may also compromise commercially sensitive information

(e.g. production data and revenue, which are highly confidential to individual companies) and go beyond what is required to monitor the risk of 'over-allocation' – particularly in light of the other changes proposed in this consultation which address these concerns.

This is particularly the case for our sector, where there is a number of growers (approx. 250), a number of which are small businesses.

The benefits of data collection need to carefully balanced against the administrative costs of gathering the data and how that data will be used/whether that level of data collection improved the system.

We recommend that any data collection be undertaken in consultation with industry bodies, to ensure accurate data for the sector.

Transition period

Q. 22	Should the five-year transition period for changes in eligibility status remain, or be changed? Why, or why not?

The Consultation Document signals that some of the proposals being consulted on (regarding updating allocation calculations and eligibility criteria) would likely result in some activity classes no longer being eligible for IA (or a lesser amount of IA). It is also suggested that it is unlikely that alternative approaches would be implemented in the first emissions budget (i.e until after 2026).

We consider this poses a risk to some businesses that could be managed through an adequate transition period. It is key that growers have certainty with suitable time steps.

Given the potential for quite significant change in eligibility criteria/baselines, five years is not sufficient and will leave the industry 'high and dry'.

We seek that the transition period be amended to a ten-year transition period, to enable businesses to plan, and be in a position (hopefully) to transition to lower carbon fuels, rather than being forced out of business.

Long-term direction of industrial allocation and future mechanisms

HortNZ welcomes a discussion on the longer-term direction of IA policy and the potential for fundamental changes to assist in meeting climate targets.

We see a continued role for free allocation for domestic food supply and carbon leakage as part of enabling transition.

Q. 23	Should we look at an alternative mechanism to address emissions leakage? Why, or why not?

Yes – we think there would be value at looking into other options to address emissions leakage.

Growers are concerned about the risk of imported products, not subject to climate change policies as robust as New Zealand's, displacing NZ grown products in the domestic market.

Commentary on alternative options in the consultation document

Carbon border adjustment mechanisms

There are pro's and con's to this approach, notably there are potential disadvantages in terms of potential trade barriers (and New Zealand's free trade policy approach) and administrative challenges.

We consider that it would be wise to hold off on implementing such as measure in New Zealand at this time and instead monitor and review the approach and success (or otherwise) of other countries that pursue this (for example, the EU's proposal for a Carbon Border Adjustment Mechanism). However it may be useful to consider whether such an approach would be suitable in New Zealand.

Credible assurance and carbon-footprint standards could also enable consumers to make choices that reduce the risk of carbon leakage. We seek policy support for the use of Industry Assurance Programmes use in regulation and markets.

For horticulture, the GAP (Good Agricultural Practice) are vehicles for growers to prove they meet regulatory and market requirements. These schemes could be used to provide certified carbon footprints. The Governments focus on farm planning presents an opportunity to support the use of credible Industry Assurance Programmes aligned to JAS-ANZ, such as GAP, to deliver product certification.

Direct payments to industry

HortNZ support further consideration of direct cash payments to EITE firms that would offset the cost impact of the ETS.

A benefit of this approach is that it would likely be more administratively efficient for greenhouse growers.

Partial exemptions from the NZ ETS

We do not support this option, as presented in the discussion document.

The way in which partial exemption from the NZ ETS is discussed appears on the face of it to be similar to how industrial allocation works (except not based on production, but actual NZ ETS costs). From our understanding of the discussion document, this would provide limited assistance to greenhouse growers, stating "this option would not help EITE firms that do not have surrender obligations but still incur indirect costs from higher fuel or electricity prices."

However, we consider that the following should be considered:

- An exemption from ETS costs (or allocation) which aligns to the 95% allocation provided for the rest of the agriculture sector under He Waka Eke Noa (this being provided on the basis that there is not the technology/mitigation available). This could be time-bound, until such time that as low carbon technology and fuels are available and economically viable. This may require an investment in international carbon credits to cover the emissions in this period.

An alternative option would be to invest directly in supporting the sector to transition to low carbon fuels (rather than purchasing international carbon credits). If we assume the government will have to buy international carbon credits to cover the costs of the free allocation, this could be worth in the order of $80 million dollars to support the glass house sector. However as outlined in this submission the design of free allocation is not assisting

the sector to transition, due to capital costs and the limited ability to increase the price of vegetables. If instead the government invested in of the future committed funding now (with a discount rate applied), it could assist the industry to transition sooner. For example, if the allocation air-marked for 2027 – 2030, was anticipated and spent in the next five years as capital cost, it could enable the sector to transition, and negate the need for the free allocation after 2030.

Our initial analysis suggests that both of these options have similar costs and theoretically globally have the same emissions – but the latter has the benefit of securing our food supply. Whereas, the status quo (as discussed in this submission) will likely lead to significant downsizing of the greenhouse growing sector, resulting in negative health outcomes and reduced food security. While this would reduce emissions locally it is unlikely to result in reduction in emissions globally because of carbon leakage.

Q. 24	What alternative mechanisms to IA would better address the risk of emissions leakage, and support domestic and international emissions reduction targets?

We strongly support MfE evaluating alternative mechanisms, to not only address the risk of climate leakage, but also alternative mechanisms of assisting New Zealand to meet it's climate targets for the greenhouse industry.

HortNZ considers that there should be consideration of exempting greenhouse growers from the NZ ETS, as an alternative mechanism (alongside complementary measures to ensure progress is continues towards carbon targets).

The Netherlands provides an example of this kind of approach:

- As outlined in the Netherlands Climate Agreement[28], there is a comprehensive range of initiative supporting the greenhouse horticulture sector to progress towards carbon reduction targets, including projects relating to geothermal energy, use of residual heat, sustainable electricity and carbon capture and supply. We understand that the EU-ETS has a participation threshold of 20MW (i.e only greenhouses exceeding this would be included)[29]. This Agreement signals 'a commitment to an opt-out provision from the EU-ETS for greenhouse horticulture businesses'.
- It is also noted that the Netherlands Carbon Tax (additional to the EU-ETS) excludes greenhouse horticulture.[30]

We consider there is justification to explore such as approach for the greenhouse sector in New Zealand, alongside transitional assistance.

Q. 25	Should IA policy or any alternative explicitly encourage firms to reduce emissions? Why, or why not?

[28] Netherlands Climate Agreement, 2019
[29] https://www.europarl.europa.eu/doceo/document/E-7-2012-007462_EN.html?redirect
[30] https://www.stibbe.com/en/news/2020/june/public-consultation-on-the-industry-carbon-tax-act-levy-and-trade-in-dispensation-rights

The discussion document notes the concern that – *'Expanding the policy to explicitly support emissions reductions could undermine the objective to protect New Zealand firms from emissions leakage'*

We recognise this concern however consider that in some situations, it could be a useful criteria that would support the assessment of industrial allocation decisions (i.e would industrial allocation support a firm to reduce their emissions), however not as a mandatory criteria/requirement across the Board, recognising the different opportunity to transition different sectors.

Q. 26	What method could be used to encourage emissions reductions?

To support transition to low carbon fuels (and emissions reductions), the sector needs investment and time to move past industrial allocation as a means of easing the social transition, to investment in a strategy to achieve the transition. There is also a need for:

- Centralised strategy and planning,
- Enabling regulation to support the development and supply of sustainable alternative fuel sources, such as regional biofuel and geothermal hubs,
- Ongoing surety of supply of low-emissions fuels (this is currently a significant limiting factor for biomass).

Wider considerations in industrial allocation policy

HortNZ is strongly of the view that decisions around industrial allocation, or an alternative, needs to include wider considerations.

This has been something that we have called for in several recent submissions, for example in our submissions on Reforming the New Zealand Emissions Trading Scheme: Proposed settings (Feb 2020):

> "There is a need to review the ETS system and free allocation criteria. Free allocation principles should be designed to account for global emissions and food security. There is a need to prepare for a more carbon constrained future, while maintaining domestic food security."

We consider that New Zealand's domestic food security, and whether support assists an industry to transition to a low emissions economy are both criteria that should be added to decision-making in regard to support for industry, for the reasons explained below.

HortNZ considers that the purpose of IA should shift towards maintaining food security and driving global emissions reductions.

We explain why we consider these two criteria to be necessary below.

Contribution to domestic food supply (food security)

Greenhouse growing is a resilient way of producing food that is part of our domestic food production network. Crops grown in greenhouses (e.g tomatoes, cucumber, capsicum) can only be grown for a short time of the year outside.

Producing food while adapting to climate change is vital – New Zealand needs to continue producing food to feed itself (for our domestic food security) and export food.

For the greenhouse growing sector, the technology and fuel sources are not yet available for economic transition. Faced with rising ETS prices, many greenhouse growers will go

out of business. If greenhouse growers go out of business, New Zealanders will face higher prices leading to reduced vegetable consumption and increased imports (this may also increase carbon leakage).

The Paris Agreement speaks to a 'fundamental priority of safeguarding food security' and action in a manner that does not threaten food production. A key theme of HortNZ's submissions on climate related policy is the need to provide for our ongoing domestic food security. Policy that forces covered crop growers out of business due to the required speed and/or costs of transition, would likely have negative impacts regarding food security.

Health

Winter growing provides for a variety of vegetables throughout the year. An Otago University study showed that when prices increase (as would be the case in New Zealand if crops grown indoor were replaced by imported and preserved products), consumption of vegetables is predicted to drop, with negative health consequences.

As discussed (in section 8), sales of these products is very price sensitive – as the price increases consumers purchase less volume.

Research indicates that families in New Zealand living in more deprived areas substitute fruit and vegetables with cheaper energy-dense nutrient-poor products when there are increases in fruit and vegetable prices[31].

Resilience of supply

Greenhouse crops are an integral part of New Zealand's food system, enabling New Zealanders to access freshly grown vegetables from a local supplier throughout the year; provides resilience within the domestic food system; and is important for risk management at a national level. The covered crop industry plays an important role in levelling out market supply in the shoulder and off-seasons. This is particularly important when there are adverse weather events that impact the country's few areas where there is winter production of certain vegetables.

Loss of growers in the greenhouse growing sectors would likely reduce New Zealand's food security, likely with no reduction in global GHG emissions, as the vegetables would likely be replaced with imports that are not subjected to carbon pricing.

Supporting transition to low emissions economy

As explained elsewhere in this submission – there are challenges for the greenhouse sector in transitioning to a low emissions economy.

We do not consider that the rapidly rising ETS costs are assisting in growers making this transition, and are in the contrary making it more challenging.

If industrial allocation was one of the tools which was used to support industries such as greenhouse growing to transition away from fossil fuels, this would have a 'win-win' outcome; by both accelerating progress towards uptake of renewable fuels (and corresponding emissions reduction), but safeguarding an industry which produces fresh and healthy food for New Zealanders.

There is the potential to link this to ensuring ongoing efforts to decarbonize.

[31] Rush, E., Savila, F., Jalili-Moghaddam, S., & Amoah, I. (2018). Vegetables: New Zealand Children Are Not Eating Enough. *Front. Nutr.* https://www.frontiersin.org/articles/10.3389/fnut.2018.00134/full

Other comments

Q. 29	Do you have any other comments, ideas or critical feedback that could help support the Government form final policy decisions?

Complementary supportive policy (need for a 'carrot' not 'stick' approach)

For the greenhouse growing sector – which is producing food for New Zealanders – there needs to be a holistic approach which supports the transition away from fossil fuels at a pace which is realistic and achievable for the industry.

> *"The cost of forcing businesses to change without practical help is likely to be a lot higher than the cost of government investing into changes. It literally could decimate our industry which is not the intention of the Paris Agreement."* – Greenhouse grower

As touched on earlier in the submission – need to consider the ability of businesses to remain viable throughout the transition to a low emissions economy (especially with regard to food production).

We consider there a need for long term co-investment by government with industry, and or access to low cost loans, and/or rebates on ETS expenditure, should be considered, for example:

- Supporting development of alternative fuels – for example, there may be opportunities for the government to investigate the feasibility, and then potentially facilitate the development, of geothermal for greenhouses in an area such as Canterbury or South Auckland.
- Recycling funds gathered by the ETS, so they are proportionally returned to those who participate in the scheme so they can be used to fund investment in low emissions transition.

Sector-specific considerations need to be considered

We consider it necessary to take into consideration specific features of the greenhouse industry, particularly:

- The greenhouse sector is producing health, fresh (perishable) food for New Zealanders and not necessarily able to pass on additional costs to consumers (this also has social implications) as explained in this submission.
- Range of business sizes; horticultural producers are mostly small to medium sized businesses with a few larger corporates in some sectors. Changes in costs can have a dramatic effect on the ability of these businesses to remain profitable and continue to offer job opportunities to New Zealanders.
- There remain challenges to transition, which the sector is making efforts to overcome, but it requires long-term thinking.

Certain policy environment

A certain policy environment is required to encourage the investment required to transition to a low emissions economy without businesses becoming uneconomic and closing.

There have been many changes to the ETS in recent times, and a very rapid rate of prices increases. Alongside this there is also policy proposals to regulate through the RMA the use of fossil fuels in process heat.

Regulation of fuel supply

The ETS has impacted on the market, increasing competition and costs of alternative fuels. In our view regulation is required to ensure the fuel market is operating efficiently and is designed to meet New Zealanders essential human health needs

In order to transition, growers need biomass. We consider regulation should be used to ensure a greater proportion of slash is recovered from forestry. Forestry is being encouraged through the ETS. Slash being left on the hillside has environmental risks, and its recovery and use as fuel has environmental benefits. There needs to be consideration of the current operation of the market, in terms of the environmental risk and the opportunities to support transition, and the role regulation might play in supporting these outcomes..

Growers who have transitioned to biomass are vulnerable to suppliers pricing. For example, growers who have abated their energy are essentially passing the lion's share of free allocation through to their woodchip supplier, so in effect wood chip when used for glasshouse heating, is priced by the supplier to align with the cost of alternative fuels such as coal and gas, rather the cost of woodchip for other uses.

Growers face competition for fuel form public sector organisations such as schools, and large export producers such as Fonterra. It is important that domestic food supply is not priced out of this market.

Appendix A

Examples of energy savings – grower case studies

SOUTH ISLAND GROWER
Indoor and outdoor vegetable crops

This grower operate 13ha of greenhouses growing tomatoes, capsicums, and eggplant in the South Island. They also have 250ha of outdoor crops and operate 365 days of the year.

They have taken a balanced approach to improving their energy efficiency and transition from coal as the primary heat source in their greenhouses. They have achieved a 20% carbon emission reduction since 2015, through a better understanding of their heating demand and needs, and by investing in energy efficiency improvements.

Their principles have been:

- Use less energy, by improving energy efficiency, and
- Emit less emissions, by switching to a lower carbon fuel.

The grower has utilised a heating specialist to develop an energy plan with their staff to meet their crop energy and site requirements. Their completed energy projects include:

- **Installed Heat Flow Meters** on Boilers
- **Thermal Screens**: Retrofitted 6ha (60% of site)
- **Underground pipe**: Linked all glasshouses with over 3km of pipe
- **Buffer tank:** Installation of a 2 million litre hot water buffer tank
- **Boiler reduction**: Reduced from 8 to 3 coal operational boilers

This grower was not previously using heat flow meters and these were installed to understand what boilers can and cannot do, in order to gain better efficiency and utilisation. They have also reduced their number of boilers from 8 down to 3 (and now use between 1 to 3 boilers depending on the environment). This has resulted in the operational boilers reducing from a total of 30MW capacity down to 9MW and the boilers running at higher loads and more efficiently.

When reviewing options for their operations, the grower investigated using electricity but it was not feasible for their location (research identifying a 4MW cable down the State Highway was needed!). They also looked at solar but their greenhouse heating use is at the wrong time of the year for solar heating to be feasible (i.e., their need is in winter).

Next steps for their site include:

- Retrofitting the remaining 4ha of glasshouses with thermal screens.
- Wood pellet conversion at leased properties.
- Biomass boilers – switching fuel from coal to biomass (supported by GIDI funding).

The grower's biomass usage will be 33,000T per year, peaking over 5 months during winter. The wood supply needs be within 100km of their site to be feasible, and they are building up credible suppliers over time.

Key learnings on their journey to improved efficiency to date have included looking at how they could reduce demand, developing an energy reduction road map and breaking it down to achievable parts over time.

NEW ZEALAND GOURMET
Greenhouse tomatoes and capsicum
Auckland and Waikato

Waiuku

New Zealand Gourmet (NZG) grow capsicums under 5ha of glass at Waiuku, South Auckland, for supply to the local domestic market, and also for export. The site employs approximately 40 staff (and 150 at the North Auckland site) during the peak of the season, growing capsicum plants for 11 ½ months. One square metre produces approximately 30kgs of fruit during this time. The site uses natural gas to feed their boiler to produce CO2 to optimise fruit quality and run their glasshouses at an average 19-20ºC during winter. This is done to maintain production over the cooler months.

At this site, NZG are utilising the following energy saving measures:

- Energy screens – thermal screens are used to control humidity, keeping moisture in the glasshouses during summer. During winter the screens keep heat in with growers closing the screens at night to keep the sun's radiation in and save energy. This site closes the glasshouse screens daily at 4pm and NZG report they have achieved at energy savings of 30- 40% (reduction in gas use) in their greenhouse by using the screens effectively.
- Hot water storage is used to heat the crop at night through the use of an insulated hot water buffer to store heat produced during the daytime operation to generate CO2 for use in the glasshouse and heat to be used at night when the heat demand is the greatest.
- Wind – this site utilises a nearby windmill (decommissioned from the Netherlands) to provide power to the site.

NZG use CO2 from the natural gas supply to maintain the quality and shelf life of the capsicum crop, with the plants absorbing CO2 during daytime. Without CO2, they would not be able to produce export quality capsicums as the quality is reduced. This would mean for export they would be limited to sending fruit by air only, rather than by sea, resulting in a much higher carbon footprint. NZG advise that natural gas have given them a 20% increase in production which is needed to pay for higher costs.

Low carbon energy options investigated by NZG include:

- **Biomass** - to heat this area of glasshouse requires 10 to 13 truck and trailer loads of woodchip per day plus suitable dry storage area on site to store and handle the woodchip. A large chipper could be used to chip forestry slash plus two truck and trailers would be needed for transport. The problem with transitioning to biomass is growers will be competing for supply from the same forestry in the Auckland region as both the public sector and other process heat users, which would likely result in the forestry available being cleaned up after a few years and a supply problem. In the South Auckland area there is only approximately 25,000 tonnes of

waste wood available per annum. A 5ha glasshouse would use 10,000 tonnes per year.

- **Biodigesters** – an initial cost calculation indicates a $30 million capital investment is needed to heat a 7.5 ha greenhouse. This is not feasible in the current market.

- **Geothermal** – this requires a study on availability of underground heat. It looks to be the most cost-effective options however drilling a hole to explore for geothermal costs at minimum $1 million just to get started. Also greenhouses would have no access to CO2 so would need to buy this in separately.

- **Solar** – based on the size of this site NZG would need around 20ha of north facing land for solar panels to deliver the energy they need. They envisage they may be able to transition to 70% energy supply with solar and 30% natural gas for CO2 consumption in the future however need certainty of market settings to enable an investment of this scale.

Mokai

NZG also grow tomatoes and capsicums in glasshouses at Mokai in the central North Island. This site uses adjacent geothermal supply for their energy requirements.

At this site NZG have been working with technology innovator Hot Lime Labs to generate CO2 supply from wood chip to supplement the greenhouses.

They also have LED lighting installed to maximise growing conditions. They grow a tomato variety called 'Campari' and can grow up to 50kg of tomatoes per plant vs normal cocktail tomatoes would yield under 30kg without the use of grow lights. However, running LED lighting is very expensive and requires access to power thus this site's access to geothermal generation allows the use of the additional lighting to be feasible.

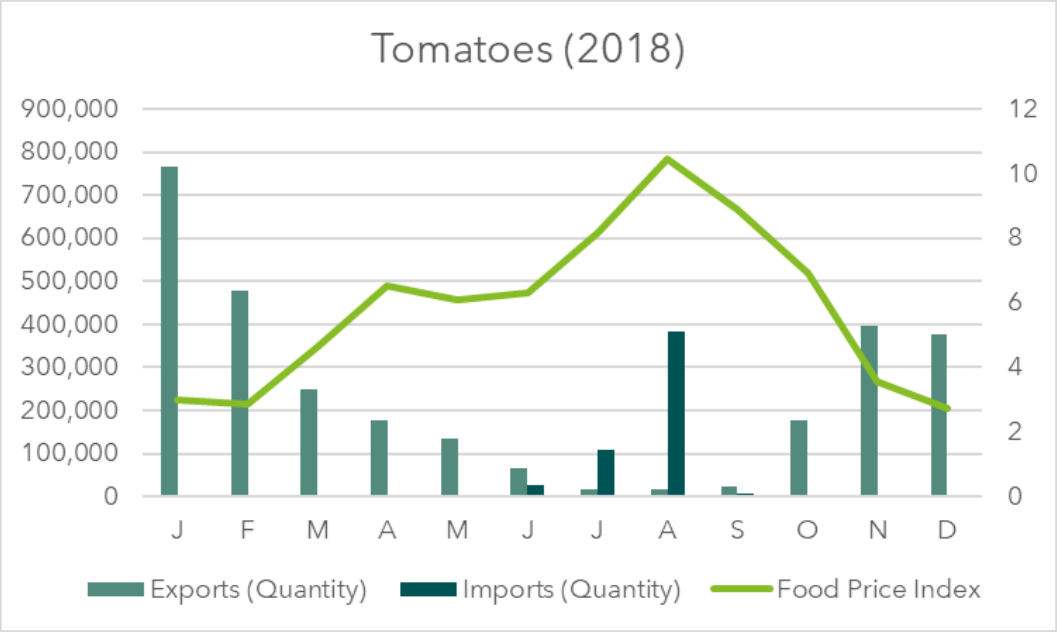
CO2 uptake

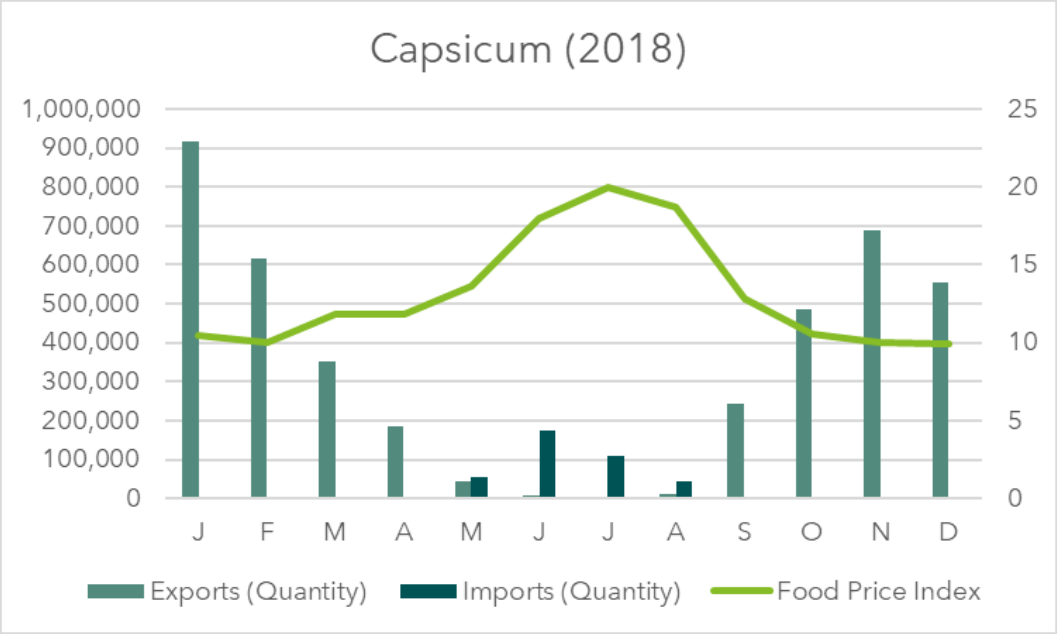
NZG have also done some work to quantify the CO2 uptake in a tomato, capsicum or cucumber crop.

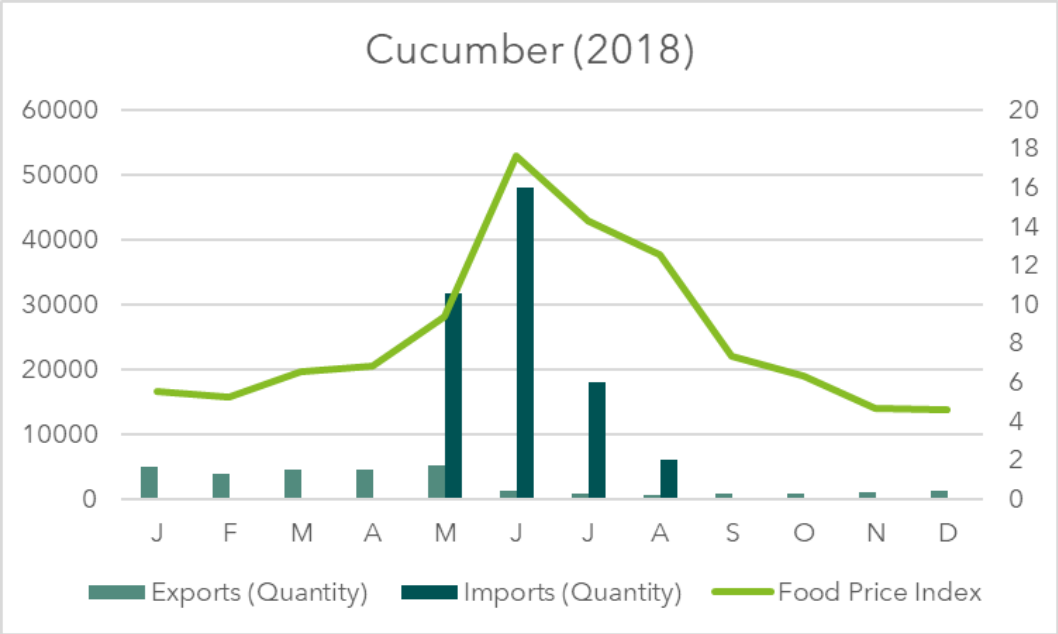
- A crop takes up about 70 tonnes CO2 out of the atmosphere per ha on an annual basis. Normally NZG apply 120 tonnes CO2 per ha per annum that they produce from natural gas.
- This 120 tonnes keeps the CO2 level just above ambient (450 – 500 ppm, where ambient is 400ppm). In this way there is hardly any leakage as it is mainly dosed when vents are closed. When the vents are more than 20% open, they shut down the CO2 unless there is heat demand for the buffer.
- It is possible to dose more and the uptake will be higher (you can go up to 1000ppm without a problem), but this starts to lead to high losses as well. This is how they operate in Holland where they have CO2 coming from nearby industries on top of CO2 from their gas burners.

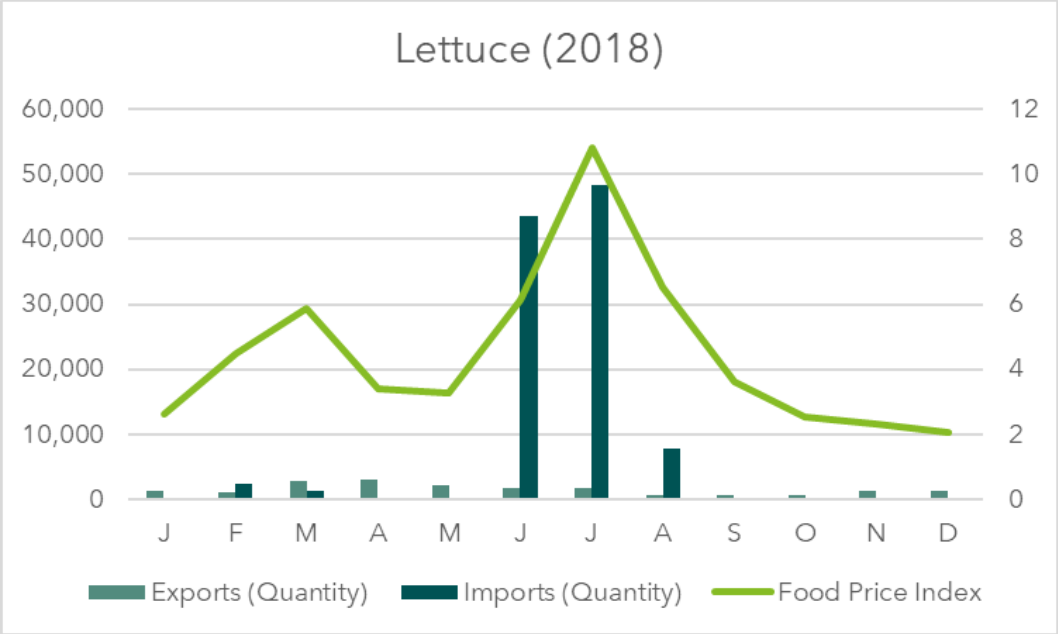
Appendix B

2018 Export, Import and Price Index data









Data accessed from Statistics NZ Infoshare tool (August 2021).

Harmonised Trade - Exports (Monthly) and Harmonised Trade - Imports (Monthly) – Total for all countries:

- 0702000000 Vegetables; tomatoes, fresh or chilled
- 0709600000 Vegetables; fruits of the genus capsicum or of the genus pimenta, fresh or chilled
- 0707000000 Vegetables; cucumbers and gherkins, fresh or chilled
- 0705190000 Vegetables; lettuce (lactuca sativa), (other than cabbage lettuce), fresh or chilled

Food Price Index Selected Monthly Weighted Average Prices for New Zealand (Monthly):

- Tomatoes, 1kg
- Capsicums, green, else red, 1kg
- Cucumber, 1kg
- Lettuce, 1kg