NZIER
NEW ZEALAND INSTITUTE OF ECONOMIC RESEARCH

The potential impact of the Emissions Trading Scheme on covered crops

NZIER report to the Covered Crops industry

March 2020

About NZIER

NZIER is a specialist consulting firm that uses applied economic research and analysis to provide a wide range of strategic advice.

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We pride ourselves on our reputation for independence and delivering quality analysis in the right form and at the right time. We ensure quality through teamwork on individual projects, critical review at internal seminars, and by peer review.

NZIER was established in 1958.

Authorship

This paper was prepared at NZIER by Chris Nixon.

It was quality approved by Mike Hensen.

Registered office: Level 13, Willeston House, 22–28 Willeston St | PO Box 3479, Wellington 6140
Auckland office: Ground Floor, 70 Shortland St, Auckland
Tel 0800 220 090 or +64 4 472 1880 | econ@nzier.org.nz | www.nzier.org.nz

Key points

Objectives

After valuing the covered crops industry in 2018, the NZIER has been asked by the covered crops industry to make a high-level qualitative assessment of the impact of an increasing ETS carbon price on the covered crops industry.

What we found

The main findings from the industry interviews[1] are:

- The industry is struggling to deal with increased fuel and labour costs as a direct result of current policy settings (and prior to MfE 2019 Consultation Document suggestions)
- Using a blunt instrument such as an increasing carbon price with little time to react is likely to dramatically downsize the industry shedding jobs and reducing employment opportunities in the regions and South Auckland. Local production will be replaced with imports
- New potential industries such as cannabis are likely to be difficult to move out of the black economy because of ETS charges
- To maintain a viable covered crops industry will require a transition strategy with government and industry working together to:
  - To develop a detailed understanding of how the industry can move away from fossil fuels
  - Examine how biomass production can assist the industry at the regional level
  - Assist businesses with grants to move from coal/gas boilers to biomass boilers.
- Industry participants have been caught in a cost squeeze between government regulation (ETS charges and increases in the minimum wage) and declining real covered crop prices. The hardest hit are small producers in the South Island because of their limited access to alternative forms of fuel
- To reduce carbon emissions further will require major capital investments in biomass boilers – between $250,000 and $2,000,000 depending on the size of the boiler
- Alternative sources of energy are unproven. Therefore, any transition period will take time before those energy sources are bedded into existing businesses
- Wood pellets are a potential source of alternative energy. However:
  - The sudden conversion to wood pellets by covered crops and other industries would create supply constraints regionally. It would also drive the pellet price up to the point where covered crop products are likely to be unprofitable

[1] The industry structure consists of a number of large players, a small number of medium sized growers, and a dwindling number of small growers. Some of the large companies have overseas parent companies that are attempting to assist their local subsidiary company develop new energy sources. Still others are able to import product relatively easily.

- The experience of those who have converted to wood pellet boilers suggests it is very difficult to secure clean, plentiful, and consistent supply of quality dry wood pellets

- At a carbon price of $50 per tonne (given current technologies) the covered crops industry will be significantly downsized. Growers will not be able to provide the volume or range they currently do. Most product will be imported.

The industry would like government to consider:

- Better linkages between its regional development objectives and its carbon zero objectives
- Industry and government working together to develop a pathway that allows the industry to adapt over time, in a way that:
  - Maintained competitiveness in the covered crops industry
  - Developed a consistent approach across all covered crops so that the covered crops industries recovered a 90% rebate on carbon (up from 60% now for selected crops).

Impact of the proposed policy approaches

The ETS is already having a dramatic effect on the covered crops industry. Many growers believe they are caught in a bind between rising energy costs and an inability to raise prices in a competitive market.

Claims by MfE (2019) that growers can pass on costs to consumers are not reflected in grower experiences. Below we set out the likely impacts at varying ETS carbon prices.

Table 1 Summary of impacts at differing carbon prices per tonne

Given current carbon infrastructure

	$25 per tonne	$35 per tonne	$50 per tonne
Industry structure	Small sized growers about to exit	Small, medium, and some large growers either change what they grow or exit	Unlikely to be many growers left
Behaviour	All growers investigating other energy sources	Reduce energy consumption, start importing	Switch to imports
Performance	Static output	Declining industry	Drastically reduced industry
Profitability	Profitability falling. Some products have not had price increases in 10/15 years (capsicums)	Those still in business earn reduce profits and run-down business	At or below breakeven for most growers
Employment	Small players shedding labour	All players reduce labour	Sharply downsized
Product variety	A wide variety of product on sale	Restriction in product offerings	Restriction in product offerings

Source: Grower interviews

Caveats

We must stress that this assessment of impacts is based on comments from interviewees cross-checked where possible against our previous work on valuing the industry. The robustness of the analysis is influenced by the potential bias in the information provided.

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1 Purpose and scope

1.1 Introduction

The covered crops industry[2] has been a small vibrant industry that has made a solid contribution to the New Zealand economy and provided choice for New Zealand consumers. In March 2018 the NZIER found that the industry contributed $120 million per annum to GDP on a turnover of $295 million per annum. The industry also paid $56 million in wages per annum.

Also, many covered crops businesses had made great strides in reducing their chemical sprays, were highly efficient at using water and are important employers in the communities they are a part of in regional New Zealand and South Auckland.

Covered crops are heavily dependent on heating, particularly over the winter period. Its reliance on fossil fuels means that the New Zealand Emissions Trading Scheme (ETS) has a major impact on the covered crops industry.

The aim of this report is to:

- Outline the likely impact of the proposed changes to the Emissions Trading Scheme (ETS) on the industry
- Investigate how the issue around transitioning from energy sources that intensively emit greenhouse gases (coal, gas, diesel etc.) to energy sources that have much lower greenhouse emission (wood pellets, food waste etc.)

This report draws on industry data and demonstrates the impact of proposed ETS charges to:

- Ensure that government fully understands the impact of the proposed ETS changes on the covered crops sector
- Illustrate the need for a transition pathway to develop a viable domestic industry.

1.2 Research process

In our first report for the industry (March 2018) we established the covered crops sector's economic impact using verifiable production and value figures and an understanding of the inter-linkages between other activities (packing, grading, etc.) and the rest of the economy (energy, fertiliser suppliers, transport providers, business services, etc).

With the cooperation of the industry and the ability to triangulate industry information with official statistics, we have sufficient confidence that this information approximates the size and scope of the industry.

We have now gone back to growers to further understand the impact of the ETS on their business. Overtime these impacts are likely to be felt all along the supply chain and 'ripple' outwards to affect the rest of the economy.

[2] Covered crops includes: capsicums, cucumbers, eggplant, herbs, microgreens, sprouts, lettuce, tomatoes, and other crops grown under cover.

1.3 Supply chain

The supply chain impacts are divided into demand and supply side impacts (see NZIER 2018 and Figure 1 below).

Since our initial report was released demand has softened with:

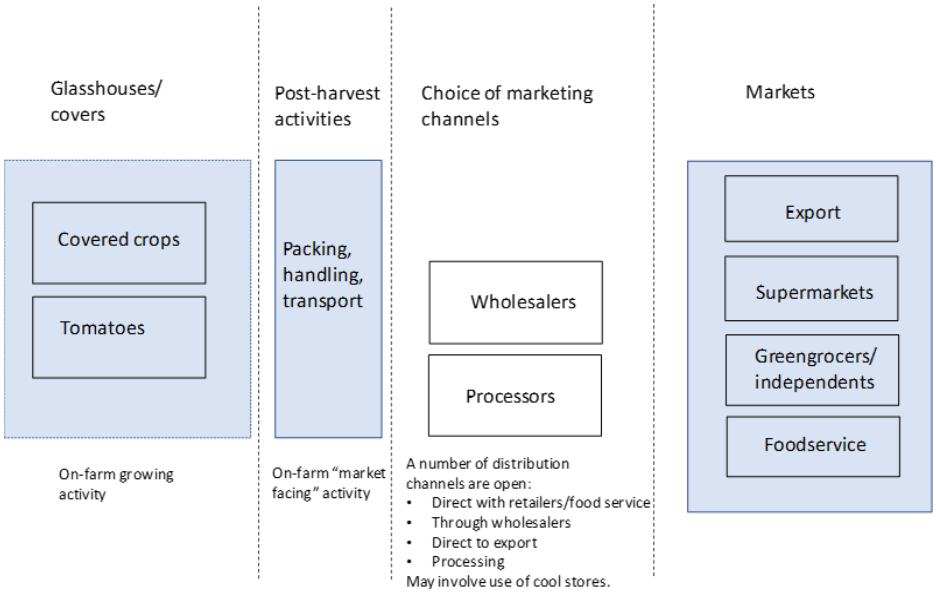
- Domestic consumption being relatively stable
- Tourism numbers while still growing are not growing as fast as they have over the past 5 years. Therefore, those producing high end products for the food services trade have noticed a levelling off in demand in the food service business (hotels and restaurants).

There have been significant changes on the supply side. After years of inconsistent and confusing policy signals from government the latest proposals by government have completely changed the outlook for the industry (through the introduction of a much higher carbon price and increases in the minimum wage).

In an industry which has high capital costs where investments are made over 20 to 30 years the sudden imposition of these charges on their business is likely to be negative. While they can make changes at the margin it is more difficult to make substantial capital changes (i.e. such as replacing a coal boiler with a wood pellet boiler) without time to adjust and assistance.[3]

The industry is consolidating as larger growers can realise economies of scale in growing, post-harvest activities, transport (particularly chilled transport costs). However, the impact of ETS charges is accelerating the exit of smaller growers and encouraging larger growers to replace domestic production with imports much faster.

Figure 1 Covered crops value chain



Source: NZIER (March 2018)

[3] MfE calculate that the marginal abatement cost is approximately $60 (Figure 18 p34, Potential Greenhouse Gas Mitigation Options and their costs, 2020)

ETS charges are particularly impacting on smaller growers who are paying 100% of the ETS costs (although all participants are reconsidering their position in the industry). These growers are either reducing their labour or closing their doors. Those exiting the industry cannot sell their businesses as a going concern since there are no buyers.

This indicates that the industry will shrink in many areas where the alternative employment is limited.

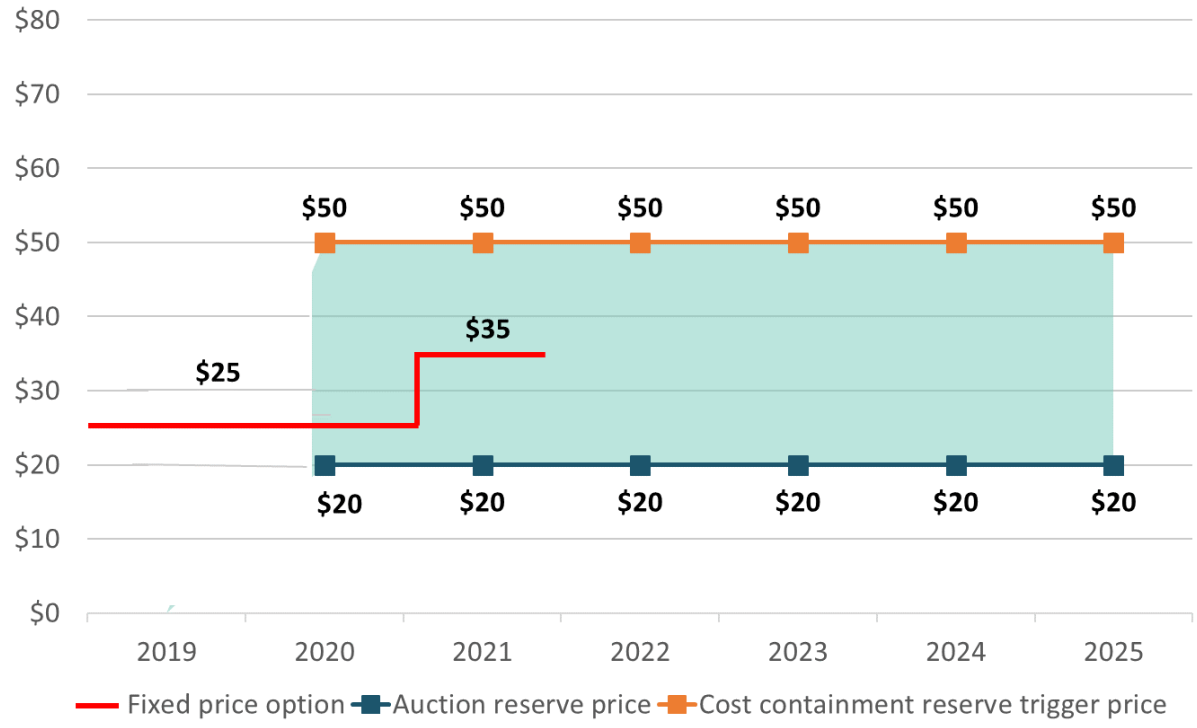
1.4 Reform of the ETS

Under the Paris Agreement of 2015 New Zealand has agreed to contribute average global temperatures well below 2°C above pre-industrial levels. New Zealand aims to reduce its domestic greenhouse gas emissions across all sectors. Forestry is also being used as a carbon sink removing carbon dioxide from the atmosphere and thus reducing our carbon target.

The ETS is the main tool that the government has to drive emissions reduction in New Zealand. As part of the structural change occurring to the ETS the government is proposing provisional settings for the ETS price controls between 2020 – 25.

The following Figure sets out the proposed carbon price controls and how they relate to the potential price path. The fixed price floor price is set at $20 per tonne of carbon (t CO_2) and the ceiling at $50 per t CO_2. The fixed surrender option price will be increased from $25 per t CO_2 currently and is proposed to rise to $35 in 2021 (see Figure 2) for those who immediately want to surrender at a fixed rate.

Figure 2 Proposed NZ ETS price controls (carbon price per tonne)



Source: MfE 2019

The impact on households is predicted to be moderate (MfE, 2019). For a middle income household with carbon prices between $25 to $50 per tonne the impact is forecast to be $3.40 per week. The analysis makes no comment on whether product choice would be limited in the face of increasing carbon prices.

The impact on firms is also expected by MfE (2019) to be moderate. Some of those facing imports have been given an Industrial Allocation of 60% that is set out the Climate Change Regulations 2010.[4] In covered crops these are producers of tomatoes, capsicums, and cucumbers. The phase down period for these allocations is also under review as part of the proposed ETS reforms.

Other covered crop growers have to pay the full ETS charge. MfE (2019) assert that these producers that do not face import competition are "*generally*" able to pass on their costs to consumers. No evidence is produced to support these assertions. This also suggests that New Zealand covered crop producers are price makers.

[4] The eligibility criteria for industrial allocations are set in the following document: : https://www.epa.govt.nz/industry-areas/emissions-trading-scheme/industrial-allocations/eligibility/

2 The impact of the ETS

2.1 Current impacts (between $25 and $30 per t CO_2)

2.1.1 The cover crops industry is stagnating

The change in industry sentiment over the past 2 years has been dramatic.

Two years ago, tourism numbers were increasing and the industry while small and vibrant contributed to regional communities through stable jobs. The industry was growing.

As policy directed ETS charges have increased and other government regulation have impinged upon their business (such as increases in the minimum wage) the squeeze on profits has been significant.

Those hit hardest are the small producers (particularly those using coal in the South Island). Many are just hanging on by shedding labour and reducing the use of boilers. Some have already gone out of business as a direct result of the ETS.

A symptom of the difficult situation many in the business face in the covered crops business is that they have not been able to sell their business as going concerns. The only value they have been able to extract is for the next best land use.[5]

This suggests that the MfE (2019) assertion that the industry can pass on the costs to consumers can be robustly challenged. A number of points can be made here:

- In the many years working for growers in agricultural and horticultural industries the NZIER has only encountered a few instances where growers are price makers and then only for short periods. Typically, in most cases other growers quickly mimic the growing decisions of the 'price-makers' and compete away the premiums. In general, the extent to which agricultural and horticultural producers are able to extract premiums on an ongoing basis is very limited[6]
- Auction systems are a major feature of agricultural and particularly horticultural markets in New Zealand. Typically, auction systems ensure that growers are price takers. As one covered crop grower remarked "*I don't know the price until our product is sold*"
- The New Zealand Treasury has always maintained that New Zealand agricultural producers are price takers on international markets. Given the structure and behaviour of horticultural markets in New Zealand it is very likely that price taking is also the norm in domestic markets.

As a result, many in the covered crops industry are taking a hard look at their businesses as they face heavy increases in energy prices and an increasing wage bill. This is occurring in a situation where real prices of their products have been reducing – for years.

[5] This figure varies depending on whether the land is sub-dividable or not.

[6] In trade modelling this phenomenon is recognised through so called Arimington elasticities. These elasticities can show the degree to which producers – producing highly valued products – can push prices up before substitution occurs.

2.1.2 The low hanging "energy" fruit has been picked

The two biggest costs are labour and energy in covered crops. The pressure on energy bills means that many covered crops businesses have spent significant amounts of money conducting energy audits, hiring specialists to optimise boilers, and introducing new processes and practices to reduce their carbon footprint. They are about as efficient as they can be – given the current state of the heating technologies they are running.

To reduce their carbon profile further will require a major overhaul of their heating technologies. The capital cost could be anywhere between $250,000 to $2,000,000 (depending on the size of the boiler).

Increasing the nervousness among growers is that these alternative energy sources are unproven and are likely to take time – over the medium term – to be bedded into existing businesses.

2.1.3 It is not just a matter of switching technologies

Growers have been casting around so they can further understand how they might move to other sources of energy technologies. Below we look at some of the difficult issues that need to be overcome before they can be used effectively and efficiently.

Wood pellets are the first cab off the rank

Wood pellets are seen as a viable alternative to coal and gas particularly in the South Island. A number of points need to be made about wood pellets:

- Wood pellets need to be sourced within 100 kms for them to be economic
- Much larger storage space is required. The space required to store wood pellets is 4 times larger than what is required for coal
- The number of wood pellet suppliers needs to increase. Currently, there are very few suppliers of wood pellets
- Currently wood pellets are between $50 and $100 an equivalent tonne higher in price than coal
- A wholesale conversion to wood pellets by all those currently burning coal would as one grower suggests "*culminate in supply constraints on available local supply of both 'dry' and 'green' biomass*". Growers also recognise that as the price of biomass increases, they are likely to be uncompetitive since constraints on biomass supply and transport costs will outweigh what they can sell their product for in the market
- Another likely impact is that the price of wood pellets would come under pressure as timber mills react to the increase in demand (to the point that it reaches export price parity). This demand pressure is likely to be underpinned as other transitioning industries also demand wood pellets (e.g. hospitals, schools etc.)

Further, the experience of those that have converted to wood pellets has been mixed. One producer has been unable to secure a clean, plentiful, and consistent supply of quality dry wood pellets over the past 15 years. They have had to pay a premium to local timber mills to divert "greenchip" from export which are focused on other products.

Other biomass projects are very uncertain

Other covered crops businesses are investigating using food scraps (that creates bio-gas) and bio methane. Both projects are very complicated and whether they succeed or not is unclear.

Niche energy sources can work

One small grower has been able to convert their boiler over to re-refined oil (i.e. waste oil from garages and fish & chip shops etc.).

However, they do point out that the amount of re-refined oil available is very limited and they have been "lucky" to find a supplier who has guaranteed their supply of re-refined oil.

Geothermal energy can also be used and some producers are taking advantage of this. However, there are only specific locations where this can be accessed. With the risks to covered crops businesses increasing (heating and labour costs) many investors would prefer alternative investments.

2.1.4 Behaviour of retailers and unexpected consequences

Basic economic theory would suggest that dramatic increases in taxes will drive some producers into the black economy. They will reduce their operations to "hobby" status and supply retailers under the table.

One producer commented that the way this has started to develop is that some retailers have been "*silly enough to advertise for covered crops using social media*". Retailers have been offering to buy speciality crops such as kale in exchange for coffees, muffins etc.

While this is currently small time, we should expect this sort of behaviour to increase as carbon prices increase. This will increase the costs of surveillance by local and central government.

2.2 What happens to covered crops at $35 per tonne of carbon?

Most businesses will restrict their heating. The impact of this will be to reduce production (increasing imports) and reduce labour.

Smaller business, unless they can move to alternative sources of heating, are very unlikely to be able to bear the costs associated with the ETS. Others will reduce their heating and change their crop mix.

The likely impacts on the covered crops industry are:

- The covered crops industry will reduce in size quite dramatically. The estimated 2,400 FTEs in 2017 will more than halve as small/medium sized producers reduce staff and production, and large businesses struggle
- Some major firms will dramatically decrease what they grow (shedding labour) and import more crops such as capsicums, cucumbers and tomatoes
- For crops other than cucumbers, tomatoes, and capsicums (imported and some locally grown), what consumer choice will be restricted i.e. leafy vegetables such as fancy lettuce, kale etc.

2.3 At $50 per tonne of carbon

Unless alternative fuels can be found and made to work at a practical level the covered crops industry will significantly reduce in size. Some growers may survive but it is unlikely they will be in a position to provide the volume, range, or at prices that the average consumer can afford.

Most of product will be imported.

2.4 Summary of ETS impacts a varying ETS prices

The impact of ETS charges as they increase is likely to be dramatic. At an ETS charge of $25 per tonne the industry is finding it difficult to survive. Smaller players are exiting the industry while medium to large scale businesses are contemplating their future.

At $35 per tonne most players will reduce their heating to a minimum. All covered crops businesses will reduce labour.

At $50 per tonne of carbon, importing will be the main activity.

Table 2 Summary of impacts at differing carbon prices per tonne

Given current carbon infrastructure

	$25 per tonne	$35 per tonne	$50 per tonne
Industry structure	Small sized growers about to exit	Small, medium, and some large growers either change what they grow or exit	Unlikely to be many growers left
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Product variety	A wide variety of product on sale	Restriction in product offerings	Restriction in product offerings

Source: Grower interviews

3 To remain a viable industry a transition pathway is required

All industry players have reduced their heating bills over the past 5 years by making their businesses as energy efficient as possible under current technologies.

Effectively forcing the industry to pay more for their energy with little time to react is likely to have a dramatic impact on local production volumes and ability to sustain employment at current levels within covered crops.

The ability to change rapidly is highly restricted because of the huge amount of capital invested in current industry technologies and the uncertainty around technologies that reduce greenhouse gas emissions (i.e. will they work and at what price).

3.1 A transition pathway will be good for emission reductions

The industry requires a stepped transition pathway that reduces the reliance on traditional heating sources (coal and gas). This requires:

- The development of a coherent strategy that links regional development objectives to carbon zero objectives
- The establishment of an approach where government and industry work together to develop timelines that plot a realistic pathway that allows industry to adapt to a significantly reduced carbon use future. This approach needs to:
  - Maintain international competitiveness in the covered crops industry
  - Have a consistent approach to all covered crops not just those currently designated as facing import competition by allowing all covered crops industries to recover a 90% rebate on carbon (up from 60% now for selected crops)
  - Delay the stepwise increase in ETS fixed price charges to fit in with a government-industry strategy
- Developing an assessment of the ability of the regional biomass supply out to 2035 and 2050 that could better inform the industry of the prospects of products such as wood pellets. Of particular focus is:
  - The price paid for wood pellets by industry
  - The supply constraints and the quality of supply
  - Establishing a detailed understanding of how further competition can be generated in the wood pellet business
  - Further understanding what other sources of biomass can be utilised at a regional level and what encouragement is required.
- Assist the industry with grants to change its capital configuration (e.g. conversion of coal to biomass boilers).

Using a blunt instrument such as an increasing carbon prices through the ETS is unlikely to assist the industry adapt in the short run. This is because of the significant capital investment required to change. The response of the industry will be to, reduce employment in the regions and South Auckland and reduce production. Imports will also increase.

This may reduce carbon emission that New Zealand reports against its targets. However, it will not stop carbon leakages (through imports) and may increase or maintain levels of carbon use in the black economy.

4 References

MfE (2019) Reforming the New Zealand Emissions Trading Scheme: Proposed settings. Consultation Document

NZIER (2018) Valuing Covered Crops. Report to Tomatoes NZ and Vegetables New Zealand. March 2018.