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# Future Proofing the Red Meat Processing Industry: Sustainability at the end of the Chain

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## EXECUTIVE SUMMARY

In an evolving world, with consumers aging out of the market and new tastes and values emerging with generational change, comes the microscope over New Zealand export markets. Stemming from strong primary sectors, questions are being asked now not just of animal welfare, food safety, price and provenance but also sustainability practices. As the topic of climate emergency and consumer awareness comes to the fore, consumers now want to know not just where their food comes from, but how did it get there.

The aim of this project is to uncover positive contributions being made by meat processors operating in New Zealand's grass-fed red meat sector, and highlight any pressures that may arise in future to really shake up the paddock to plate story-telling, to include processor to plate messaging. Often, the important processing component of that story is not told well, if at all.

In this body of work I will aim to identify how meat processors in New Zealand are harnessing their sustainability potential and responsibility, why it is important and how their social licence to operate is affected during this process. To truly understand this, I have conducted interviews with red meat industry leaders to hear their experiences and learn about what action they are taking. I have also looked at literature relating to social licence to operate, sustainability and how our actions alter our supply chain within New Zealand's export significant, red meat sector.

The method used to complete this project was qualitative research. Structured interviews designed to get the interviewee thinking not just about the 'what' and 'how' of their changing practices but more so, why? Why does it matter and how can it be beneficial in each facet of the business.

During my interview research, the main message was resounding. Interviewees viewed their export product as:

- Clean and green
- Pasture fed
- Antibiotic free
- Hormone free

That is how New Zealand agriculture is viewed as a global product and has been for the past 50 years! All of the above reflect the fantastic industry many generations have enjoyed and worked hard to create and maintain, ever since the first shipment of frozen lamb left Port Chalmers on the 15<sup>th</sup> February 1882. But how are New Zealand's meat processors viewed at the end of that chain, and how do we get the words climate friendly, sustainable, sophisticated and forward thinking onto that list. There is a level of social, economic and environmental responsibility required of New Zealand red meat processors which will be covered in more detail throughout this report.

Final recommendations include:

- Coopetition models to combat labour shortages and enhance social wellbeing
- Equity partnerships around topics that matter such as the image depleting bobby calf industry
- Further research and investment into natural gas capture and reuse as fuel, water conservation and fertiliser alternatives from meat processor by products

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## INTRODUCTION

Some may perceive the red meat industry in New Zealand to be heard with a low hum of a “she’ll be right” attitude. Year in and year out, the grass will keep growing, the cattle will keep coming, the exports will continue to flow, and we will consequently, have somewhere to send them. But what if we didn’t? What if the collective conscience of our consumers, with their strong emphasis on food safety and animal welfare at current, expanded to encompass their moral compass too? Moral compass can be learnt, passed down or shaped through generations. We are seeing that there is overall, a 42% decrease in New Zealanders red meat consumption (Beef + Lamb New Zealand, 2019). Consumers want to know, not only where their meat came from, but also what that journey looked like to their plate and how that affects not only their health, but planetary health too.

We are living in changing times with sophisticated science showing us our industrialism is having both long and short term effects on our planet. With human interaction comes politics which affects our ability to trade. As New Zealand exporters, we need to be making an effort to stay on the right side of the political giants not only in relationships but also in our actions.

In this body of work I will aim to identify how meat processors in New Zealand are harnessing their sustainability potential and responsibility, why it is important and how their social licence to operate is affected during this process. To truly understand this, I have conducted interviews with industry leaders to hear their experiences and learn about what action they are taking. I have also analysed current literature relating to social licence to operate, sustainability and how our actions alter our supply chain.

With only 15 months of direct employment in the red meat industry, but a lifelong experience of feeding and growing animals, I feel this has stirred my passion to understand the industry more.

In my short time directly within the industry, I have seen an outstanding commitment by both companies and more importantly, employees, of effort, time and funds dedicated to capital investment, technology and increased capabilities at various sites. This is due to the increasing acknowledgement that as well as the increased central government legislation, consumers are making choices around sustainability practices, among other factors. Sustainability comes in many forms, from gate to plate and encompasses a large responsibility on farm and at processor level. Sustainability accreditation and recognition require monitoring practices that span water and energy use, recycling of energy and water, changes to product packaging, conversions to more sustainable fuel options and mindful waste discharge.

## METHODOLOGY

The main method I have chosen to form the contents of this report are semi structured interviews to gain qualitative data. I interviewed thirteen individuals who hold senior corporate roles ranging from marketing to operations management. Other individuals interviewed included those in compliance roles, auditing, sustainability leadership roles and directorship. During the course of writing there were numerous personal communications as well as general research which also added to the quantitative supporting figures and graphs shown throughout.

The approach I used to analyse my responses was the compare and contrast method which allowed me to highlight any common themes and gain momentum from the recurring nature or ideas they presented. This also allowed me to look deeper into any information presented that were obvious outliers, for example, a minority view amongst the group of interviewees.

The interviewing questions can be viewed in the appendices of this document and findings are discussed throughout this report.

Main themes which became prominent during the initial interviewing phase were:

Why?

- Social licence to operate
- Reputation
- Doing the right thing for the longevity of the industry, including its economic, environmental and social wellbeing
- Meeting regulatory obligations to continue operating

What?

- Water
- Power
- Recycling heat, water and biomass

How?

- Proven science based technologies
- Collective thinking with strong leadership designed to maintain forward momentum and clear messaging
- Strong marketing and sales teams to convey those messages to customers overseas



## SOCIAL LICENCE TO OPERATE

### What is social licence to operate (SLO)?

“The level of social acceptance for your organisation’s activities. It can be quantified and integrated into existing risk management systems”. (Boutilier, R. 2016)

Since 1997, SLO has been widely accepted as part of business relations in many sectors, including agribusiness and can range from tolerance through to co-ownership where levels of support are demonstrated through actions and this support is exhibited with vastly different types of engagement. I believe SLO should not be ignored due to the pride and engagement required to effectively run a large business such as a chain of processing plants. The acceptance of the activities from the people within the plant will directly impact their own engagement and aid in our labour crisis in the long term.

This concept is further explained by Penny Clark-Hall (How to earn your Social Licence to Operate, 2018) when she explains the varying types of social licence in play in our industries today. I will focus on a portion of these.

### Moral licence

The chance to “take ownership of issues threatening the traditional sector’s social licence and make its own market opportunities in the adopting of the consumers values not being met” (Clark-Hall, 2018). This could be done by pioneering certain technology or business plans. For example, growing bobby calves to 18 – 24 months in partnership with professional rearer’s and the dairy industry.

Moral licence refers to our values, for example our halal requirements aligning with both the Muslim and wider New Zealand communities’ acceptance of what meets theirs and the animal’s needs. Moral licence can also extend to environment and employee treatment including, but not limited to water quality and health and safety standards.

### Legal licence

Simply obtaining legal permissions in our red meat sector, abiding by existing regulations set out to protect air and water quality and appropriate land use. Usually arising from local or central government bodies, designed to protect the natural environment and neighbouring communities.

### Social licence

A social licence is something which is earned through positive and mindful actions. We should be able to identify improvements through our employee engagement and community feedback.

Lastly, social licence should be viewed in a growth mindset whereby collaboration is welcomed to increase scientific headway in an area where political, social and economic gains can be made.

## SUSTAINABILITY

### What is sustainability?

“The ability to be maintained at a certain rate or level” (Oxford Dictionary, 2021). This definition applies to processing plants as it suggests that the pressure we put on environmental systems, we should be able to recover to original levels to minimise our impact. Greenhouse gases must be offset and water and fuel used in a sustainable fashion.

### What is regenerative?

“Tending or characterised by regeneration” (Oxford Dictionary, 2021). Regenerative farming has been a topic in media, publications and practice for decades now but strangely it is not used in the red meat sector. This is a missed opportunity as oftentimes, meat processing plants are situated on large blocks of land owned by the company or organisation and in use under in house management or leased out. During interviews, plant land was referred to as a “nutrient sink”. Ultimately fertile land due to bio fertiliser, generated from processing by products and applying them to the land. We see this in industry, with the remnants from effluent washed off yards and paunch both acting as natural fertiliser. Giving back to the land without manufactured chemicals is regenerative in itself and should be included in the public perception.

### What does social sustainability include?

Social sustainability is about identifying and managing business impacts, both positive and negative, on people. As well as covering groups of rights holders, social sustainability encompasses issues that affect them, for example, education and health. (UN Global Compact, 2021)

### Why is it important?

Sustainability improves the quality of our lives, protects our ecosystems and preserves natural resources for future generations. Going green and sustainable is not only beneficial for the company, it also maximises the benefits from an environmental focus in the long-term. (Blu Glacier – The Ripple Effect, 2021)

### Why does it matter?

Over time, maintaining relationships, market entry and reputation is directly related to how businesses conduct themselves. During my interviewing process I noticed how the NZ Inc. message was pushed and how New Zealand’s image is very widely regarded as one of the best meat producers in the world, with limited feed lot environments and very little hormone and antibiotic use opposed to other producing nations. While biosecurity is also a driving factor in our primary sectors, our ability to adapt and thrive is also of interest.

KPMG’s Ian Proudfoot spoke in 2019 about “how the transition to a low carbon future is unstoppable”. Proudfoot also highlighted how new generations growing into the sector are non-tolerant of inequality or inaction around issues they have no problem voicing. Climate change and our footprint is a topic which is growing more intolerable as we succumb to generational change.

Climate change is known to be caused by human activity, but the effects of that unfortunately demonstrated in adverse changes to weather, affect our suppliers directly with the way, and where they farm. Susan Kilsby, ANZ Agriculture Economist urges our primary sectors to survive by adapting our practices, sustainability included, to meet our consumer’s demands. In our evolving market with

conscientious consumers coming to the forefront, we are seeing that “a quality product isn’t always enough to charge a high price. Instead, a growing number of educated consumers are just as interested in the product life cycle and expect ethical standards to be upheld throughout the production process.” (Kilsby, 2019). This is true too, we are seeing that word ‘expect’ come up time and time again where products that historically would have garnered a premium in more than just a niche market, for example, carbon neutral beef, are now evolving into simply being a market entry point (exhibiting sustainable practices).

## FINDINGS & DISCUSSION

Sustainability opportunities on plant includes, but is not limited to:

- Heat exchangers or boilers (equipment/technology advances)
- Water Use
- Recycling
- Packaging
- Effluent
- Rendering
- Using every part of the animal first and foremost
- Land use
- People

### Social

Part of my findings during my interview research conducted with a view on marketing and export sales relationships was an emphasis placed on employee welfare by importers of our product. The definition of employee welfare and the importance placed on various facets of welfare differs for various nations. Importers can expect and demand that our employees be free from modern slavery, free from child exploitation, have minimum health and safety requirements and have fair pay. These are a sample of ethical components considered by nations engaging in trade with New Zealand.

This notion expresses a moral compass being exhibited by conscientious consumers globally with consumers in varying countries opting for not only halal product, food hygiene standards and animal welfare auditing. But also for employees on our chains here in New Zealand to be in a quality working environment.

People in procurement roles organising contracts and stock flows have the opportunity and responsibility to provide continuity and reliability of stock flow and therefore continuity and reliability in process workers employment. Meat processing roles which are primarily labour focused have the risk of seasonality affecting their welfare as income wanes for parts of the year. MPI has been encouraging the cooptation of primary sectors to work together to increase employee wellbeing and relieve labour shortages by providing people the opportunity to engage in continuous employment across a range of roles varying in nature and skillset. This cooptation is a threat to meat processors in a job market where we are experiencing major labour shortages. This is an issue which must be addressed by government officials and has been put under pressure by COVID-19 travel restrictions for overseas employees working in New Zealand under a Visa.

The challenge with the cooptation model will be that after a period of employees working in horticulture, for example, ensuring those same employees feel compelled to return to the meat processing plants. This will be where our welfare and culture will become apparent alongside common factors like location, hours and pay scale.

## Environmental

Water use is a huge part of the red meat sector. From the gate to the plate, quite literally, there are thousands of litres consumed from the birth of the animal through to end product consumption. In the processing sense, water is vital as it provides known welfare to the animal while yarded as well as providing the very important hygiene aspect when preparing and processing the animal. Below is an outline of typical processing consumption per head of beef and lamb.

### Processing water per animal per day requirement

- Beef Yards 400 litres / head
- Beef Slaughter 1100 litres / head
- Beef Boning 100 litres / head

Total water cattle per head 1600 litres / head

- Lamb yards 100 litres / head
- Lamb Slaughter 250 litres / head
- Lamb Boning 35 litres / head

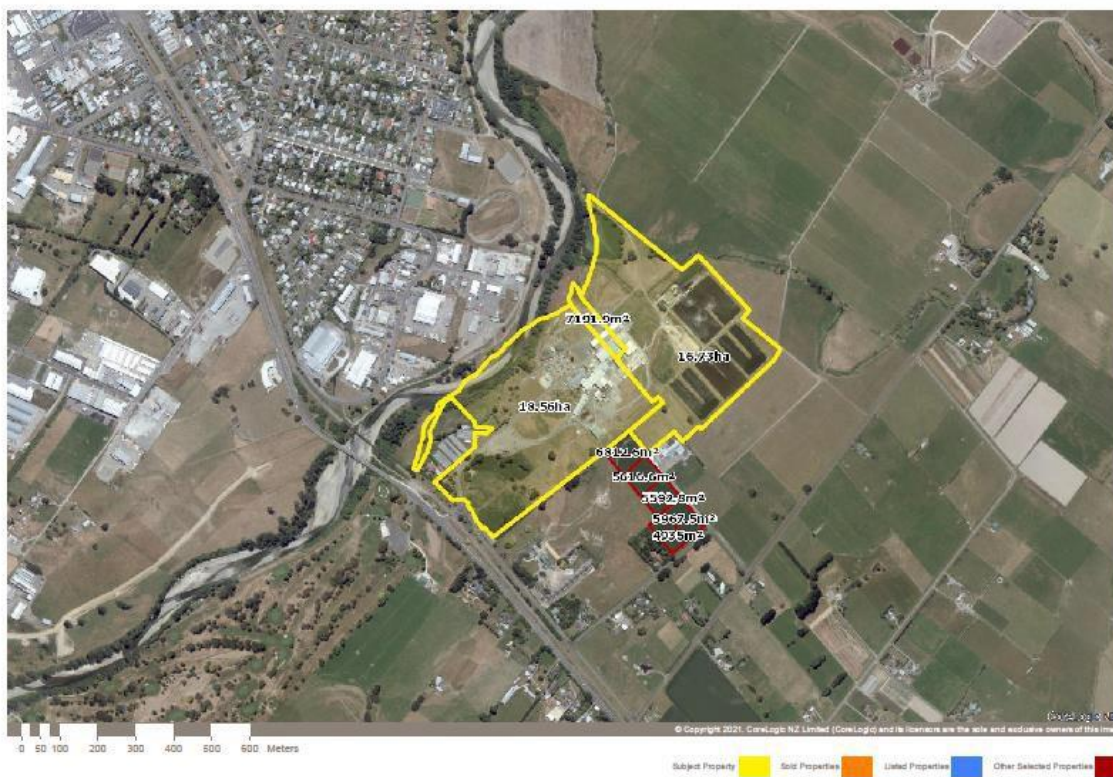
Total water Lamb per head 385 litres / head

*Tony Miles (2021)*

Water conservation occurs through treatment and at a large capital cost due to less water use impacting systems right from water take, through the plant and out to effluent systems. Keeping in mind that these technologies work in ratios, they experience complications when not run as they are designed. However, water conservation can occur in many ways, one example is by injecting capital into ovine washing and water recycling systems. Washes such as the Klenzion brand which combine water and detergent delivered via jets while ovine are carried on a belt can reduce up to 30 litres per head simply by adjusting the Psi of the jets. The detergent obviously adds another environmental aspect to consider but the water reduction is a huge bonus. Savings of 30 litres per head, in a yard that might see 3000 lambs a day, six days a week for three months of the year, with some of those litres being recycled is really exciting, positive and simple technology.

Industry and government requirements guide each choice made at plant level. Regulatory requirements at a local or central government level often are reflected in turn with market access requirements and will continue to do so as our conscientiousness towards the storytelling behind our food increases with generational change. For example, the emerging New Zealand Farm Assurance 'Plus' program includes the need for integrated farm plans which actively measure greenhouse gas emissions and any sequestration efforts. This green tick is highly sought after in UK markets among others who value food safety, animal welfare and environmentally sustainably produced meat. This push for stringent trading agreements among nations, including New Zealand was further highlighted from the likes of Brexit, sparking further negotiation requirements. Similar agreements continue to be negotiated and tweaked by capable teams daily.

Resource consents are required when commercial activity will be utilising or disturbing a water source or discharging waste into water, air or land (NRC, 2021). The latter is often the case as we see air pollution, nearby river or stream use and land application of by products from commercial activities in many New Zealand red meat plants. Often, the sites are historical and have required significant capital investment to stay updated, see below for an example.



*Figure 1: 38 hectares of land mass at AFFCO Manawatu, historically situated next to a dominant waterway. (Property Guru, 2021).*

From a portion of processors surveyed, we can see that all New Zealand plants are continually engaging in and completing energy efficiency initiatives and projects, often hitting targets before deadlines. This ranges from water conservation, heat recovery, energy monitoring, alternative technologies and further modernisation of plants. For example, EMSOL, a company dedicated to energy management, reductions and technology offer these insights.

## Lighting

- Habitually turning lights off at appropriate times
- Running sensors to turn off lights when a space is uninhabited or when sufficient natural light is available
- Replacing lights with LED technology

the site. When coal burning produces 18% of New Zealand's power source, these simple savings can make a big difference when large companies are taking action.

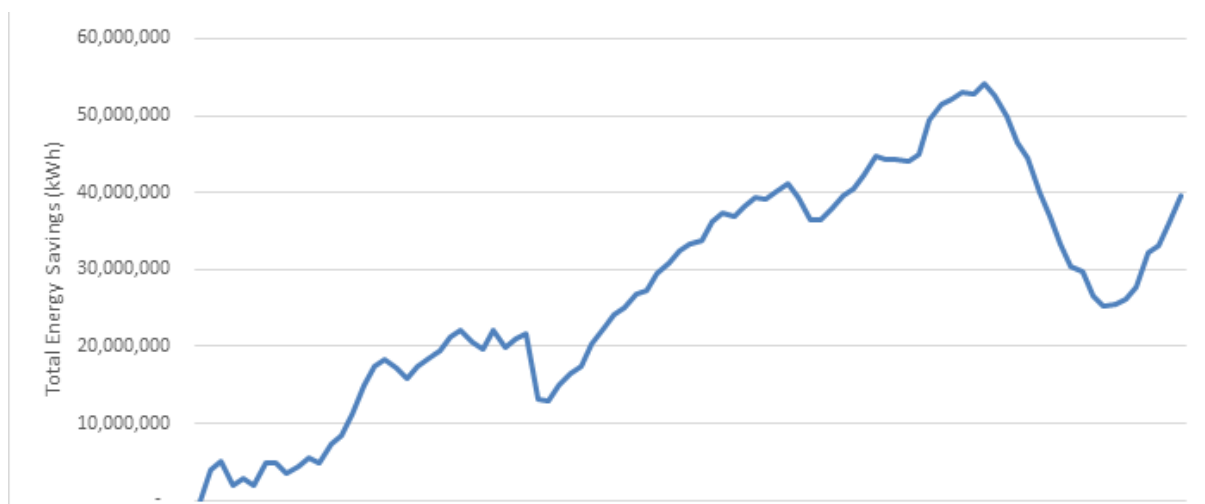
## Refrigeration

- Altering discharge and suction pressure
- Installation of rapid close doors
- Fixing leaks in a timely fashion

## Heat transfer

- Recycling natural (effluent) heat for water heating prior to going to boiler
- Insulating steam valves

There are a number of informed ways in which companies like EMSOL can assist. Please see below for examples of large fiscal gains as well as environmentally positive impacts.



*Figure 2: Increasing commercial energy savings since embarking on an EMSOL energy saving commitment in 2015. (EMSOL, 2021)*

## Why does it matter?

Because “nearly 41% of New Zealand’s greenhouse gas emissions come from the energy sector.” (EECA, 2021) See below.



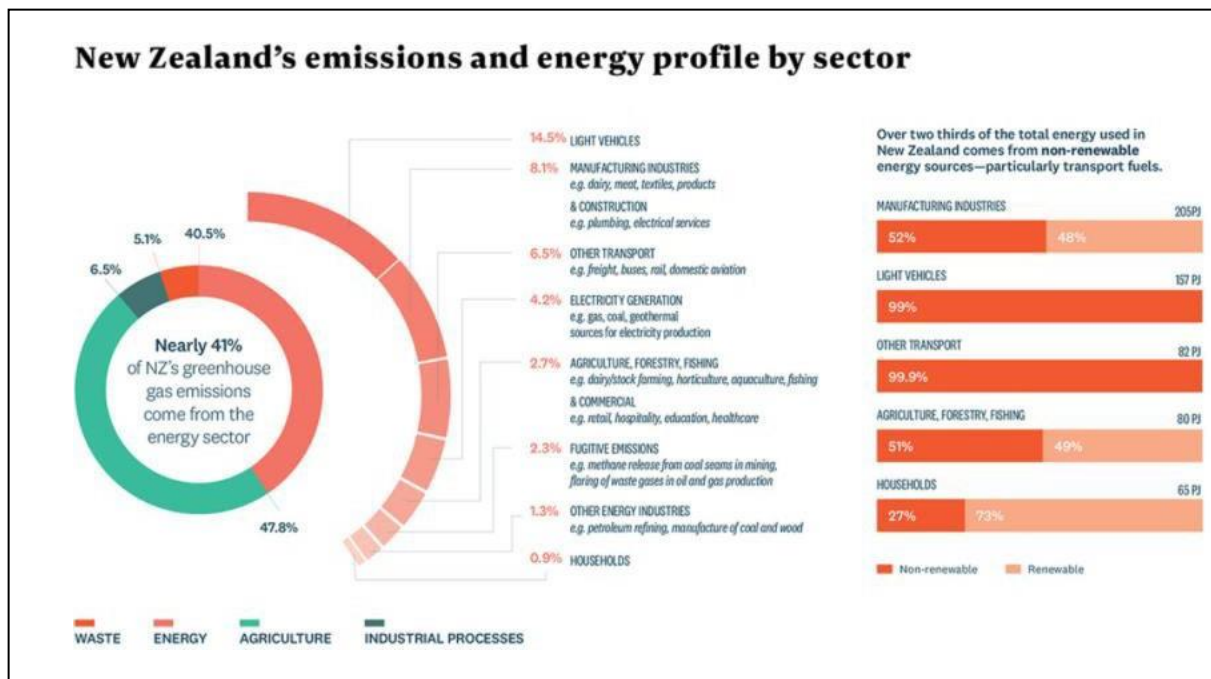


Figure 3: New Zealand's emissions and energy profile by sector. EECA (2021)

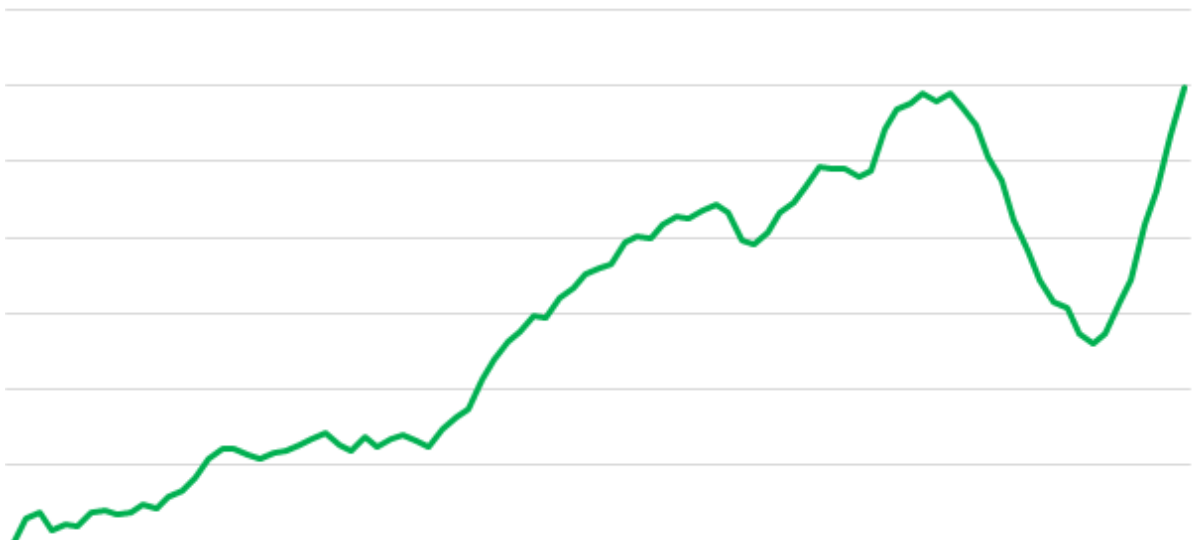


Figure 4: Commercial carbon dioxide emission reductions since moving boilers away from coal fuel. (EMSOL, 2021)

We do notice a dip in these EMSOL graphs caused by COVID disrupting usual business, e.g., holding fullreefers on site in a red meat exporting environment. These carbon dioxide equivalent savings cannot be revealed but the general upward trend of the graph shows a general reduction through technological improvements over time.



Carbon dioxide emissions reductions lead to:

- Electricity use
- Reducing fuel use
- Optimising fuel use
- Reduction of chemical use (production of these creates carbon dioxide in factories and during transport and application) (Beef + Lamb New Zealand, 2021)

Waste is also being captured, treated and re used as fuel. An example of this is the process of installing a biogas boiler to create hot water for the plant. This biogas is obtained from the waste stream of the plant and treated with agitation and recycled heat to increase the fermentation process, culturing bacteria and producing greenhouse gases such as methane and carbon dioxide which are then filtered out to a gas chamber, leaving behind water vapour and creating biogas which can then be heated to the optimal burning temperature for plant requirements.

Legislatively, this use of energy has been limited by electricity industry regulation.

### Economic

Shown in the latest Red Meat Report “Fit for a Better World”, three critical factors are listed as to why the Red Meat Sector needs to show cognitive and physical effort towards a sustainable movement through forward thinking, but also, why it is urgent.

1. Economically, New Zealand is a nation dependent on our exports and their value. “Food and fibres contributed 77% of New Zealand’s merchandise export earnings in the year ending June 2018, at nearly \$42 billion worth out of a total of \$55 billion.” (Fit for a Better World, 2021).
2. New Zealand produce high quality and consequently sought-after product on overseas shelves, but we are geographically distant from major markets. This increases our need to stand out from the masses through value-add initiatives.
  - Clean, green pasture raised livestock
  - Antibiotic free
  - Hormone Growth Promotant free
  - Respected waterways
  - Gold standard animal welfare operators
  - Gold standard employers in primary sector

We know that this comes back to our farming communities. The reason the topic of sustainability is growing in importance is because these extra grass roots efforts may only equal market access, not market premium.

3. Tourism, Agriculture and Trade all cross over and must cohabitate in the natural environment to ensure reputation, income and employment opportunities stay strong.

Below, we see how our domestic consumption of red meat is faring and how the rise of conscious foodies here in New Zealand should be acknowledged and potentially studied as our sector aims for continuing success in the export market.

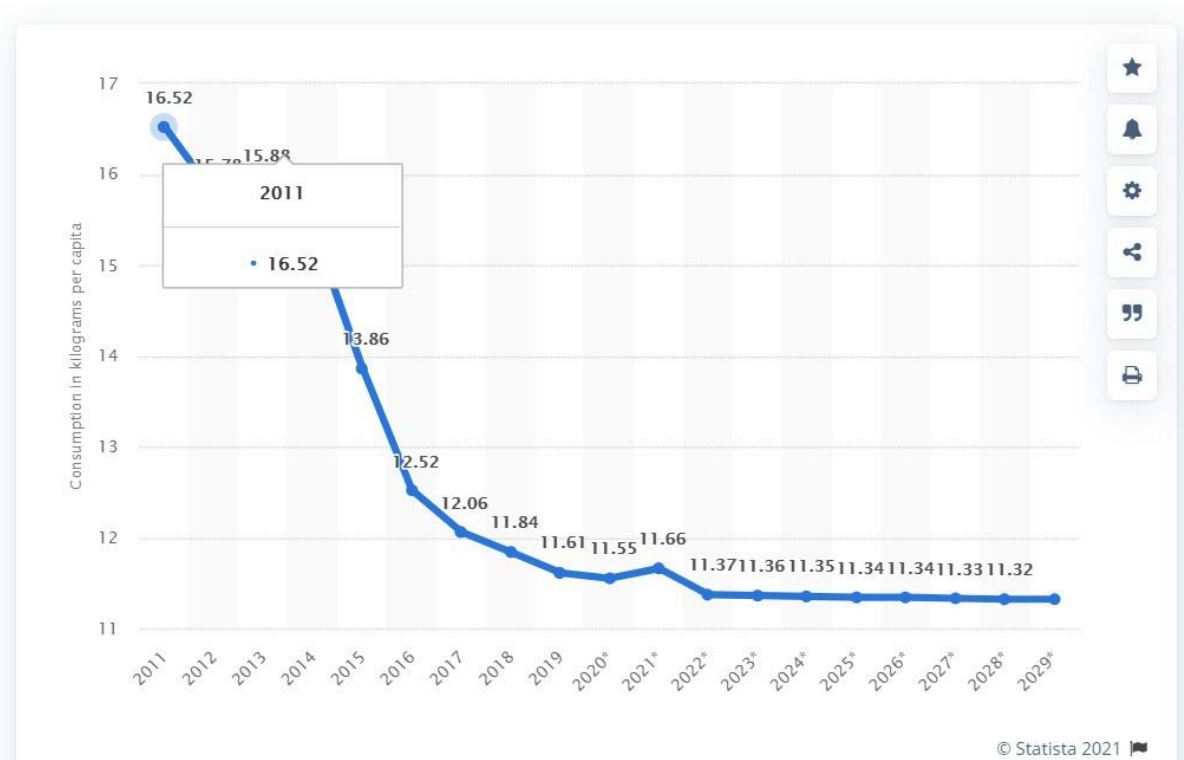


Figure 5: Per capita consumption of beef and veal in NZ from 2011 – 2029. (Statista 2021)

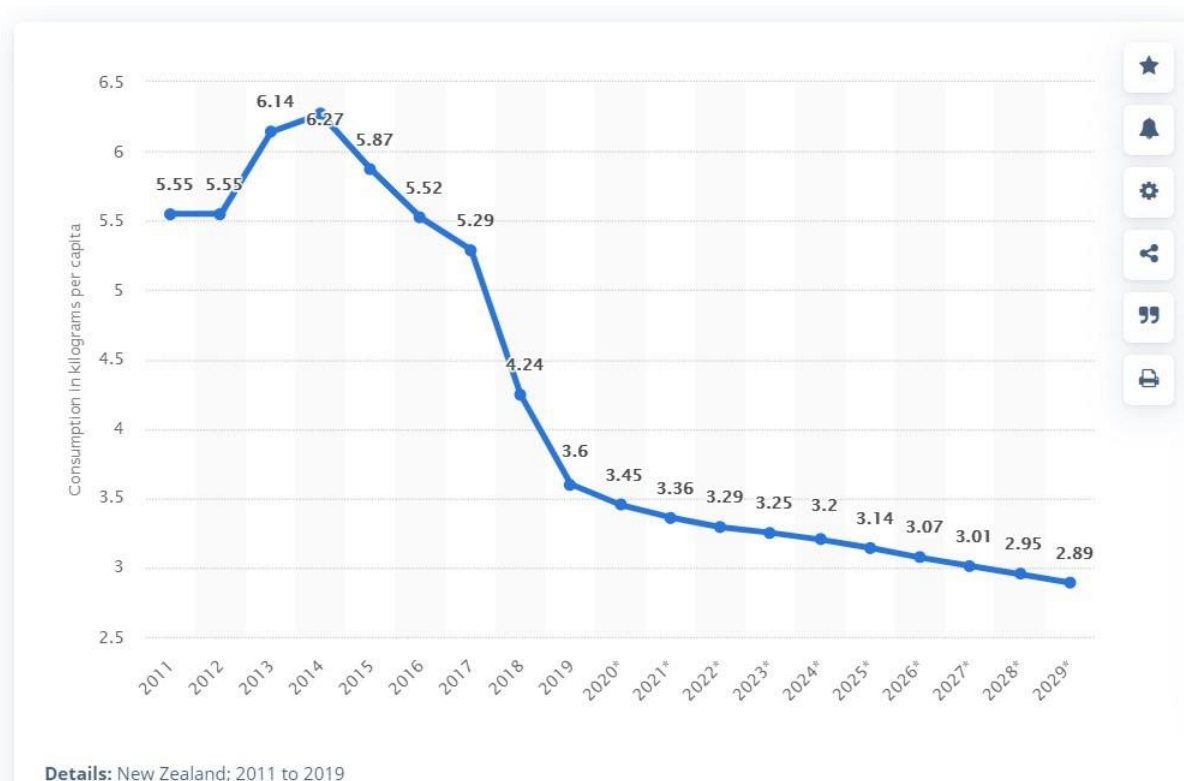


Figure 6: Per capita consumption of sheep meat in NZ from 2011 – 2029. (Statista 2021)

Conscientious consumers are described as “shoppers who are increasingly choosing to make conscious buying decisions, by purchasing local, ethical and environmentally friendly products” (TGM Creative, 2020). In the two graphs above we can see that the rise of the ‘conscious foodie’ has already made its mark with significant reductions in meat consumption per capita over the past 10 years. This illustration gives us insights into the need placed around sustainable practices to market our story successfully to the world, knowing that this trend will likely not see premiums in the pocket of our processors or suppliers, but that sustainably produced product will be more of a key to market entry over time.

### Why do these factors of environmental, social and economic aspects matter?

Because they matter to people involved in the sector every day. Stakeholders who have identified our market trends and understand the matters which deserve the most urgency. This is shown in the graph below.

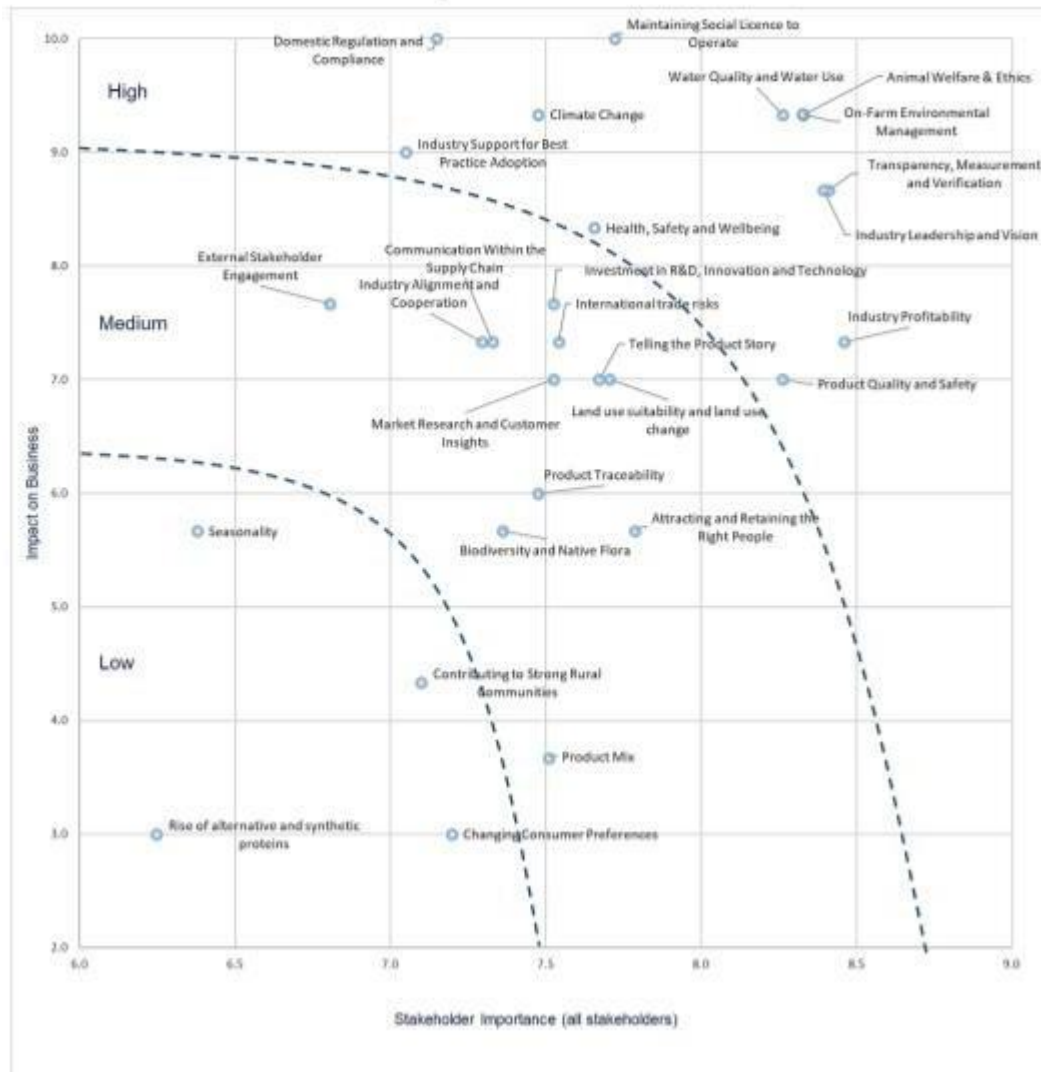


Figure 7: Materiality Matrix for the New Zealand Red Meat Sector. RMPP Materiality Report (RMPP, Thinkstep, 2021)

## Greenhouse Gases, Politics and Economies

As an aside, government preparedness is also highly important when referring to greenhouse gases. Recently in the UK, meat processors are finding their factories almost impossible to run due to a carbon dioxide shortage. In reducing our emissions, it is also sound advice to be mindful of when we may need certain emissions for our food industry.

Financial viability modelling needs to include the cost of **not** always reusing plant production by-products, but rather storing it. It is reported that the cost of carbon dioxide in the UK September 2021, has risen sharply with a 400% increase. Research & Development investment should reach out to and link with the likes of the Callaghan fund for assistance both financially and academically to avoid crises like the UK processors are seeing now.

## FRESHWATER

Emerging requirements such as enforcing farm plans with detailed recording of on farm activity and mitigation measures to protect natural environments and waterways are coming into effect. This affects meat processors too as majority have significant land ownership. Although, majority of discharge is onto land opposed to waterways in more recent times and is closely monitored by councils to prevent the risk of run off or unwanted nutrient leachate.

How will freshwater regulations affect plant treatment and discharge?

The concern here for meat processing plants is the plant location (sometimes) alongside major rivers, and the downstream impacts any environmental discharge may have. Due to the land areas that have to be considered in a farm plan in addition to the resource consent requirements of the plant, operation will be including but not restricted to;

- traffic movements
- noise
- air pollution - GHG's and odour nuisance
- Water supply, quantity and quality
- Waste management - packaging, fuels used in plant operation, wastewater, effluent

This increases the necessity for water to be used multiple times in plant production processes to reduce water take and more importantly reduce discharge to the environment.

## PROCESSOR ACTION

There are many energy and decarbonisation projects underway across the sector. These range from biogas and biomass boilers through to heat pump technology for hot water generation. Heat recovery technology is in use to recycle waste heat back into process heat systems. The specific technology varies between sites as capital investment and site suitability alters throughout the country and can be dependent on processor ownership.

“Biogas technologies based around anaerobic digestion are extracting value out of two problems - disposal of waste and climate change due to greenhouse gas emissions. This is a critical foundation of circular economies.” (Biogas, 2021) Having the ability to create a circular economy will be especially important in the event of a carbon dioxide shortage for the food industry. We may also see a shortage as regenerative farming increases, leaving behind a wake of unintended consequences such as reduced fertiliser inputs and therefore production.

Packaging must still meet market requirements for food safety but its life cycle is under the microscope with more climate friendly options at the forefront including plant based materials for labelling and recycled plastic for containment. It is however, important that food safety and hygiene is achieved.

To achieve Toitū enviromark diamond certification, an organisation:

- Controls all important documentation to ensure only the most up to date versions are being used;
- Has an internal EMS audit programme in operation, ensuring expected outcomes are occurring as planned;
- Periodically has top management review the performance of the EMS;
- Has formalised the roles and responsibilities for people working for and on behalf of the organisation;
- Communicates appropriately both internally and externally;
- Ensures appropriate training is given to people working with the EMS;
- Has documented all procedures relating to managing the system (both system and operational procedures);
- Has a good system for managing problems (non-conformities and opportunities for improvement);
- Has set objectives and targets for driving improvement and has programmes in place to meet those targets;
- Has developed, implemented and tested environmental emergency plans;
- Has identified and evaluated their significant environmental issues arising from activities, products and services;
- Is actively monitoring their ongoing compliance with New Zealand legislation and is ensuring they are aware of any changes to obligations;
- Has produced an environmental policy statement;
- Understands the scope of their EMS (i.e., are there any parts of the organisation that need to be excluded from the EMS and why);
- Exhibits no non-compliances with New Zealand's applicable health and safety and environmental legislation.

*Figure 8: Toitū enviromark diamond certification prerequisites (Enviro-Mark Solutions, 2021)*

While SFF has achieved the Toitū diamond accreditation for their efforts and planning, AFFCO is on track to becoming the only coal free meat processor in the North Island, with southern plants following soon after. All carbon emission abatement initiatives are front of mind for these processors and this is hugely promising for the sector and the export market.

“Some of our current projects include complete electrification of heat sources at processing sites, these will be a first for New Zealand and has attracted government funding to support the technology demonstration for the industry. AFFCO has a strong focus on reducing energy usage within our processes to reduce the carbon emissions at our processing plants. We have energy and process engineering consultants working to continually improve the way our plants process and to identify opportunities.” (Tony Miles, 2021)

“Over time, change continues to happen, and we have seen consumer desires change, particularly around climate change and the environment” (Sam McIvor, Beef + Lamb New Zealand, 2021). We know that 1 in 3 New Zealanders are consciously limiting their meat consumption as flexitarian diets increase with support from medical professionals (New Zealand Consumer Insights, 2019). The reasoning is

there to take action with the likes of advancing refrigeration techniques and burning biomass for the social licence boost. Processors are also seeing benefits to environmentally driven decisions such as burning biomass as fuel, such as;

- Financial savings over time using a cost – benefit analysis
- Reduction in carbon dioxide and nitrous oxide emissions
- Conservation of non-renewable resources such as coal (fossil fuel)

Flotation sludge from wastewater re used as a bio solid fuel is a good option. Not to discredit from the already beneficial second life of coal ash, albeit having different heating values. The non-renewable aspect is where the urgency for change comes in.

Methane captured off the oxidation ponds and use of bio digesters may also provide ways to create circular economies by way of re using waste for energy production internally within processors.

Lastly, biodiversity stands of natives are managed on processor owned land for purposes of regeneration and sequestration.

## SUSTAINABILITY GOALS

Details below are inspired by a survey run recently by the eRoad team, who are looking for trends in their client bases thinking towards sustainability on the road. I have included this edited version to show how interchangeable sustainability goals are at present and how this can inspire collaboration across sectors to get the best outcomes.

### **Sustainability Goal Areas (Sustainability Survey eRoad, Warwood, T.)**

- Decarbonisation of transport, fleet and assets
- Pollution control and prevention
- Resource conservation
- Waste minimisation/reduction
- Zero emissions/full carbon offset for all emissions
- Alternative/renewable energy
- Social programs, diversity, inclusion and indigenous recognition

We encourage suppliers to meet specific environmental criteria through participating in NZFAP Plus accreditation programmes and farm planning to measure their greenhouse gas production and mitigation. NZFAP Plus are emerging audits completed on farm to ensure not only animal welfare is being met but also environmental standards surrounding waterways and biodiversity.

### **Challenges to Red Meat Processors in front of sustainability goals could be:**

- Misalignment between goals and sustainability importance
- Lack of information on how sustainable actions can lead to tangible financial value
- Lack of engagement due to board beliefs
- Not enough information/data collection technology to measure sustainability action and it's ROI
- Hard to measure/keep track of our environmental impact
- Concern over moving away from conservative approaches for fear of losing engagement from front end of supply chain (farmer suppliers)
- Lack of requirements = no guidance

### **Why should sustainability drive forward?**

- Consumer demands
- Growing population meaning greater need for food to care for food impoverished globally, this possible increase in demand does not mean that climate goals should be ignored as different markets and price points will still remain in more developed nations who will, over time, demand more ethically sourced, grown and produced goods.
- The need to produce sustainably to maximise positive impacts therefore influencing our social licence to operate and our climate status.
- Climate change disasters e.g. natural disasters such as flooding affecting our suppliers directly or indirectly (e.g. supplementary feed source impacted.)
- Increased media coverage = responsibility to take action
- New regulatory standards = council placing finite lifetime on stream/river discharge.
- H&S – employee health and wellbeing



## **What is the real cost of food production?**

Multiple environmental impacts

- Climate change
- Fossil energy depletion (higher when housing animals indoors)
- Eutrophication (freshwater & marine) – Achilles heel of our trade image
- Water scarcity footprint

Living in an age of social media, we see low tolerance for values not aligning with consumers own values and poor experiences spreading widely.

During the pre-summit event “Harnessing the Contribution of International Trade for Sustainable Food Systems”, Dr. Jared Greenville made a point of mentioning how “sustainability should be rewarded and not diluted.” Although this would be ideal, we are still not seeing a strong enough point of difference in our clean, green image or sustainable efforts increasing the price point for our suppliers or industry. Our sustainable actions as a whole sector are now allowing market access opposed to premiums. The real gains will come if political ties allow for sustainably produced and processed red meat to enter overseas markets free from tariffs.

The EAT Lancet report talks about policy and sustainability regarding the feeding of a potential population growth of 10 million people without harming our planet. It also supports the notion that plant based diets need to increase by 50% and red meat diets decrease by 50% for our health but more applicably the environment. It could be wise to front foot this as a nation. So that if red meat consumption does dive, be it in 50 or 100 years, we still have a strong reason to have market presence if demand wanes. ie producing within planetary boundaries (which are measured through our farm plans), free of hormone, antibiotics etc. Hopefully gene editing becomes more acceptable as this could really help our cause with grass, tree, shrub and animal breeding for better environmental performance – low methane emitting beef and increased sequestration longevity of biodiversity stands.

Banks also play a part in our carbon footprint as they “can no longer separate finance from impact” in their portfolios, over time, all of their long term lending in the sector will have to factor in sustainability. (KPMG Agribusiness Agenda, 2021)

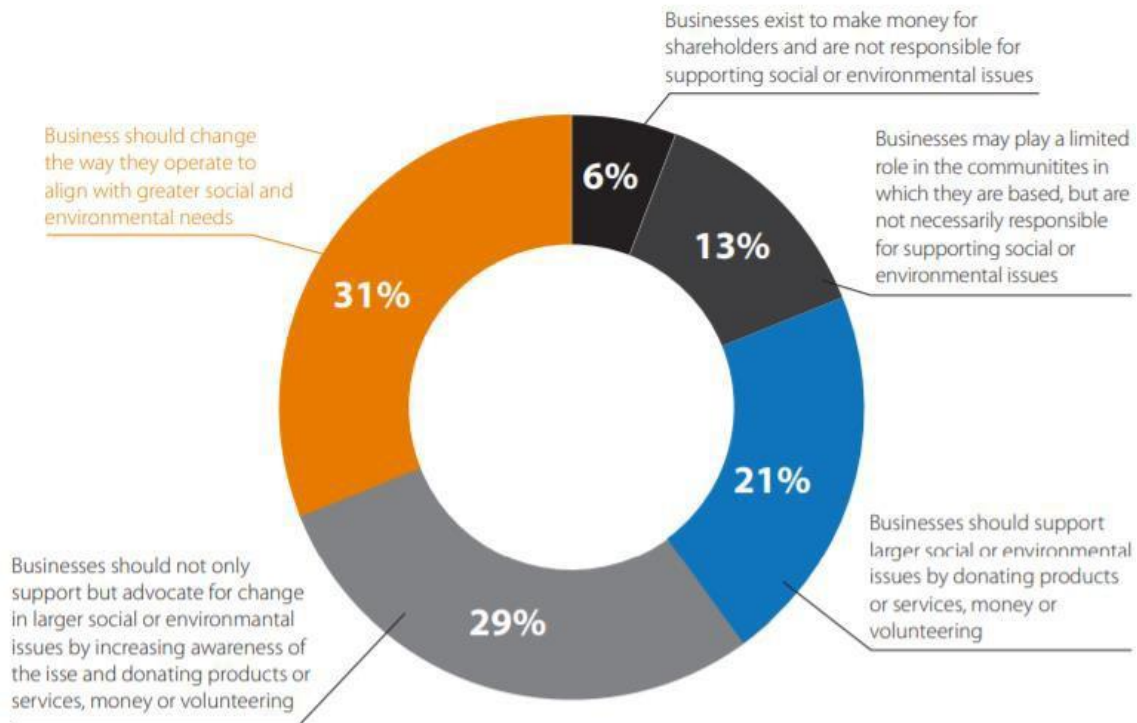
## FURTHER OPPORTUNITIES

Bobby calves fuel a large part of negative press relating to not only the dairy industry, but also to livestock transportation firms and red meat processors. Unfortunately, a lot of that criticism is met with a response of how it used to be much worse. That is not the attitude for our sector to carry when we are in a position to create positive change.

Maatua Hou, meaning new parents, is an equity partnership running in Canterbury which demonstrates the importance of marketing to the heart logic of our consumers. Maatua Hou rear calves with the upfront financial input from the supplying dairy farmers being returned to them upon the sale of those calves at weaning weight, plus 15% of any profits. This is a positive story for not only dairy but also the red meat sector as we understand that with livestock blocks going into forestry or housing, our adult beef production over time has the potential to decrease if not strategically maintained. Farmers who put their calves into this type of program do not have a guaranteed financial profit from the transaction but they will break even and it is clear that they do understand consumer perspectives as well as having “a genuine desire to give the calves a better outcome” (Dairy Exporter, 2021). These farmers are increasing intangible benefits through their actions, such as reputation and SLO. Vangelis Vitalis, MFAT negotiator understands this heart logic, which is why our actions as an industry are so important to maintain for the outcomes of our export potential and the export deals Vitalis closes.

Funding research and development on emission fed fuels and how processors can influence those emissions from farm to plant is another opportunity worth exploring and maintaining a strong foothold in.

## Beliefs about the role of business in society



**Figure 3** from: Environmental Leader article, May 23, 2013 "CSR a 'Business Requirement, Not Option'"<sup>4</sup>

*Figure 9: Beliefs about the role of business in society. Sustainable Business Council (2021)*

While we can recognise that there are many reasons businesses are in business! We can see from the survey above that there are various calls to action on important issues surrounding environmental and social aspects of markets. It is for the companies in each sector to decide if the economic aspect balances out with the morally right decision or what Vitalis (MFAT) would describe as the "heart logic" of our international markets.

## CONCLUSIONS

In a world where some schools of thought believe that we must reduce our meat consumption to combat climate change as part of ethical food consumption (Stoll-Kleemann & Schmidt, 2016), it is important that the work red meat processors are doing is recognised, along with voluntary assurance bodies such as NZFAP Plus, developed from the vision of the Red Meat Profit Partnership.

“This decade will see a great shift in the global market. Ensuring New Zealand has a seat at the global table will require us to tap into the innovation and disruption occurring across the food and fibres system around the world, align our products with the consumer values, and support each other through transformation efforts.” (Hon. Damien O'Connor Ministerial foreword, KPMG Agribusiness Agenda 2021).

I believe that we have a strong basis for success as my research into this topic uncovered an abundance of historic and existing work which is contributing to the reduction of New Zealand's environmental footprint. However, I feel there is a lack of public awareness and therefore uninfluenced public perceptions of the red meat sector being a potentially untapped space for positive press, outside of marketing efforts. I do believe that farmer engagement in sustainability issues could also be increased by making more widely known the efforts their processors are investing in and have been, for some time.

Capability and capital investment stemming from existing profitability will enable positive change in the red meat sector but the presence of strong business leadership, knowledge and experience will be required for continued, measured progress and performance.

## RECOMMENDATIONS

To combat sustainability challenges in the New Zealand Red Meat Sector, I would recommend:

- Engaging in cooptation to combat labour shortages. There is potential to create a niche job market with positive incentive to return to the red meat sector through improved social welfare.
- Enable bobby calf partnerships through funding rearing facilities and entering equity partnerships to future proof the shoulders of the season.

I would recommend a single New Zealand processor pioneering in this area by way of supplier engagement, both dairy and beef fattening blocks. Benefits would include increasing supply (potential to manipulate into the shoulders of the season) and riding the back of Masters Thesis practical work that has already been completed in the area by Samuel Pike, studying the growth of dairy beef to a lesser slaughter age for a new market. This venture would be well timed with the September, 2021 launch of New Zealand low emissions beef genetics programme, coupled with the already existing low birth weight beef breeding genetics to allow for more comfortable dairy heifer and cow calving.

- Expand further research into waste/effluent management from meat processing plants, including financial viability of utilising waste streams to reduce/reuse GHG emissions and solid waste.

For example, explore the benefits of utilising bio digesters to capture gas, in particular, carbon dioxide and methane for reuse in the plant e.g. food production (Controlled Atmospheric Storage) and power production onsite, plus high value compost/fertiliser produced by bio digester, with enhanced capture of phosphates and nitrates. Chosen Bio Digester type and capacity will be critical to success.

- Utilise Environmental DNA to trace, monitor and manage E. coli sources entering effluent ponds, and any downstream losses (need to establish or add to database for future reference.)
- Champion realistic sustainability goals published by one chosen leadership body for the sector and fairly measure them.
- Follow up on success and further opportunity for example, improved solar lifespan technology.
- Research into power company use as purchased electricity is provided to the client in whatever form it is stored on the grid, for example, solar, hydro, coal or gas. Making positive and informed decisions thereafter.
- Research into any water pressure or recycling systems, especially in a yard environment to conserve water.

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## APPENDICES

### Appendix 1: Interview Questions

1. How would you describe the existing sustainability framework in the New Zealand red meat sector? Is there formal framework in place?
2. How does AFFCO's specific environmental framework affect AFFCO's export potential?
3. What market signals do AFFCO's beef and lamb export markets respond to currently?
4. What are the main factors that these market signals extend from?
5. Do you find the topics of ethics, sustainability and environmentally friendly products arising more often in conversation within our industry or is the focus still mostly food safety based?
6. Could you describe which markets you most commonly see consumers guided by a factor other than price?
7. How would you describe the NZ meat industry's SLO?
8. To what extent do we need a social or cultural licence to operate as a meat processor and red meat exporter?
9. What are the main components of the SLO from the point of view of the producer?
10. How often do factors such as religion play a role in our SLO in various markets?
11. How do you perceive the integrity of AFFCO's SLO?
12. What are the major points of difference (food safety, animal welfare, value add etc) in the way you market to say China versus US or any other main markets?
13. What does sustainability mean to you when you think of New Zealand agriculture and the red meat sector?
14. How do conscientious consumers influence AFFCO's marketing strategies?
15. Have you noticed an increase in the values of the 'conscious foodie' in the past 5 years, 10 years?
16. What, in your opinion sparked momentum in the nutritional versus planetary health debate?
17. Do you think it is active here in New Zealand's domestic market?
18. How have our consumers' voices changed over the years?
19. Has there been a change in motive or direction with their consumption?
20. Have these noted changes involved generational influence?

21. What steps are we taking as a company to increase our SLO and therefore sales presence?
22. What potential future scenarios do you predict may arise where the market may be under pressure from ethical viewpoints?

#### Appendix 2: Secondary Interview Questions

- Are you driven by industry or council requirements when making changes? What requirements must you meet? E.g. air dispersion rates, odour nuisance levels etc.
- How much water is consumed per body ovine/beef?
- Hygiene allowing, how much water can be conserved and how?
- How does your water use affect the energy used toward your effluent systems?
- What practices are in place to recycle in your plant? Water, energy (solar?)?
- During your EMSOL commitment to energy conservation, how did your plant conserve energy?
- Do you capture any gas from waste and reuse it as fuel? If so, please explain.
- Any other major projects in line with saving \$\$, energy, water, future proofing your plant?
- Lastly, what practices do you employ to sustain people in your supply chain? Social/cultural aspect of sustainability opposed to economic/environmental focus thus far.

## Appendix 3: Woodfired Boiler conversion emission fact sheet



### Environmental Benefits of AFFCO's New Wood Fired Boiler

NZ Air Limited, an independent, qualified, and experienced air quality consultancy, assessed the change in ambient air quality effects associated with the replacement of AFFCO's current old 14 MW coal fired boiler with a new 6 MW wood pellet fired boiler.

The assessment concluded that the switch to a smaller wood pellet boiler would result in a substantial improvement in ambient air quality in the local community.



#### Key Benefits

- Air pollutant dispersion modelling showed a net decrease in peak off-site concentrations of fine particulate matter (PM<sub>10</sub>) and sulfur dioxide (SO<sub>2</sub>).
- The predicted peak concentrations of PM<sub>10</sub> and SO<sub>2</sub> at the nearest houses are less than 6% of the New Zealand health-based air quality criteria.
- SO<sub>2</sub> is a toxic gas that can cause severe irritation of the nose and throat. Symptoms of respiratory exposure include coughing, wheezing, chest tightness, and in extreme cases can cause death. Burning coal emits high levels of SO<sub>2</sub>. Burning wood chip emits a negligible amount of SO<sub>2</sub>. Switching to a wood chip boiler effectively eliminates the potential for off-site health effects from exposure to SO<sub>2</sub> gas.
- Moving from coal (a fossil fuel) to wood chip, is a more sustainable and environmentally friendly solution. The New Zealand government has recently declared a 'climate emergency' and released policies which include phasing out coal combustion. AFFCO's decision to move away from coal is consistent with these policies.
- The new air discharge consent condition for PM<sub>10</sub> emission rates from the wood chip boiler is 83% lower than what was previously consented for the coal boiler.
- Recent stack testing results on the new boiler show that the PM<sub>10</sub> emissions were 32% below the new consent limit.

Air Dispersion Modelling Results	Boiler	Predicted Peak Off-site Concentration (µg/m <sup>3</sup> )	NZ Health Based Criteria (µg/m <sup>3</sup> )
PM <sub>10</sub> - 24 hour average	Coal Boiler	22	50
	Woodchip boiler	20	
	Change in Concentration	-2	
SO <sub>2</sub> - 1 hour average	Coal Boiler	370	350
	Woodchip boiler	4.3	
	Change in Concentration	-365.7	
SO <sub>2</sub> - 24 hour average	Coal Boiler	107	120
	Woodchip boiler	1.3	
	Change in Concentration	-105.7	

AFFCO Moerewa/NZ Air changes to boiler. (Wilson, P. plant engineer. August 2021).