



100% MADE OF NEW ZEALAND

Good by nature 



Climate Change Related Disclosure
December 2022

Prepared in accordance with the
recommendations of the Taskforce on
Climate-related Financial Disclosures (TCFD).



Contents

01

Welcome

02

Governance

03

Risk Management

04

Strategy

05

Metrics & Target



01

Our first climate change related risk and opportunity disclosure under the TCFD framework is a key milestone within our transformative sustainability programme and an important tool in understanding as well as giving visibility to the climate impacts that will shape, change, and challenge our business in the coming years.

Welcome



At Silver Fern Farms, we embed sustainability into all we do.

Our commitment, and follow-through, on sustainability issues is a key way we're making sure we do the right thing by our customers who increasingly want to know that their red meat is sustainably produced. This demands not merely doing less harm, but doing greater good by ultimately enhancing the eco-systems we operate in.

We are optimistic and have a high degree of commitment to the positive role our company, our farmers and our customers can play in keeping warming below 1.5 degrees as we transition to a low carbon global economy.

We are reducing our own emissions as fast as we can, adopting science-based targets and extending this right across our value chain, including on farm, and Climate Innovation is a key pillar of our Sustainability Action Plan. Under that plan we have made strong progress and have committed to a range of bold initiatives to reduce emissions and position Silver Fern Farms as a leader in nature positive food production.

A message from our Chief Executive:
Simon Limmer

A handwritten signature in black ink, appearing to read 'S.L.', corresponding to Simon Limmer.



To do this we must continue to build our understanding of climate risks and opportunities across our full value chain and mainstream these across our decision-making at all levels to ensure we are actively working to address these challenges.

This baseline report is a key milestone within our transformative sustainability programme.

As our first disclosure, this is a report focused on identifying where climate-related risks and opportunities sit within our value chain. The next steps will be further in-depth analysis and modeling to fully inform our risk and opportunity landscape and potential financial implications.

This report not only demonstrates the scale of the challenge ahead of us and the fact that climate change will more than likely impact all aspects of our business in the coming years – but it also speaks to size and scale of the opportunity for Aotearoa/New Zealand to build a world-leading low emissions, nature positive and climate resilient food system. That's an opportunity that Silver Fern Farms intends to grab with both hands.



02

Governance

Under TCFD, we are required to:

- Describe the board’s oversight of climate-related risks and opportunities.
- Describe management’s role in assessing and managing climate-related risks and opportunities.



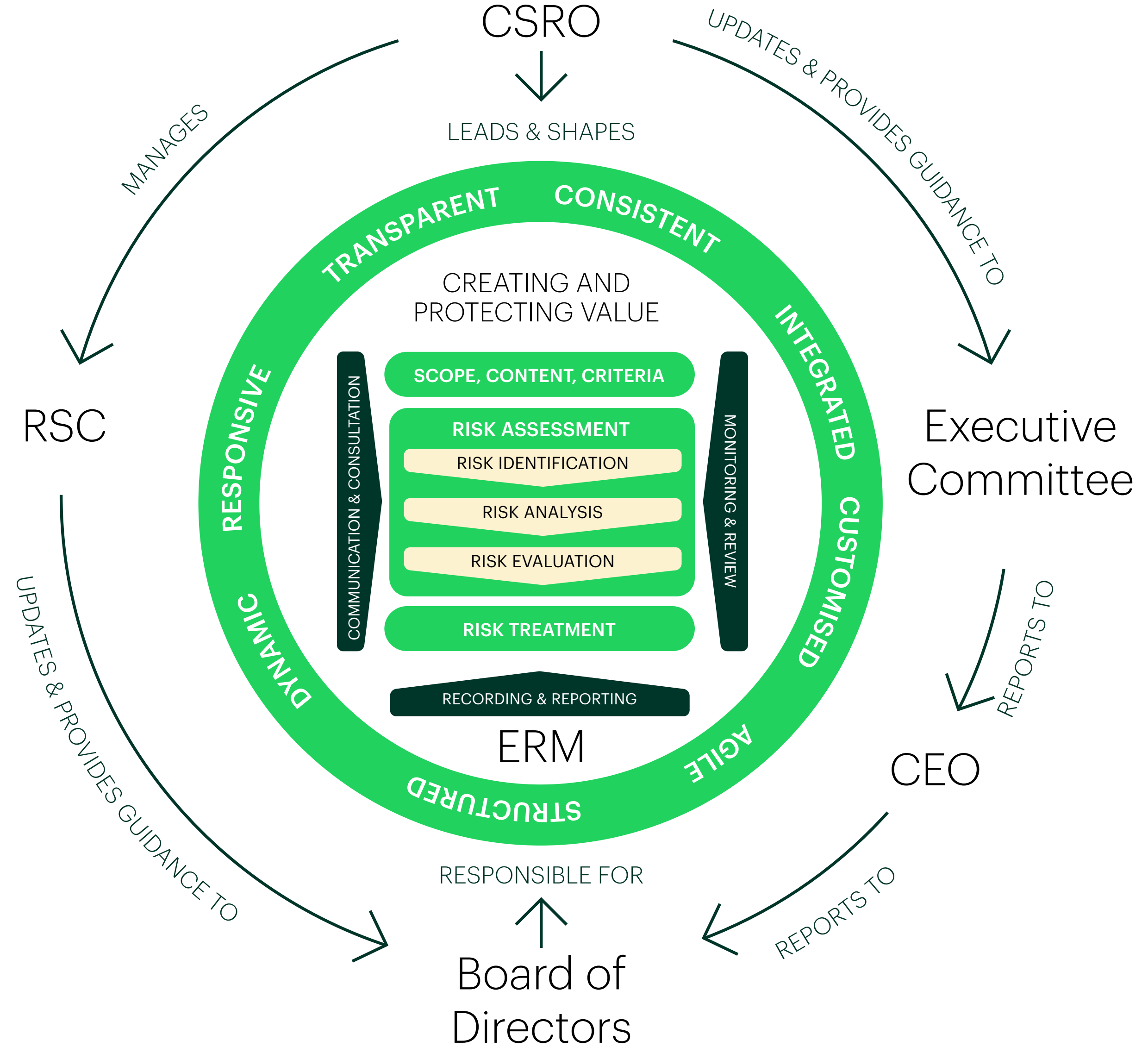
Silver Fern Farm’s risk management capability and processes have matured significantly in the past year with the first Risk Management Policy approved by the Board in July 2021.

Under this policy, our Board of Directors are responsible for ensuring an effective risk management framework is in place to protect the interests of stakeholders and to promote the creation of long-term sustainable value.

A Board Risk and Sustainability Committee (“RSC”) has been established to provide strategic guidance and feedback to the Board and to our Executive Committee on the continuing maturity of our Enterprise Risk Management (“ERM”) programme. The RSC will also assist the Board in discharging its responsibility to exercise due care, diligence, and skill in relation to the oversight and effective management of material and emerging business risks, including climate risks.

At an operational level, Silver Fern Farm’s Chief Sustainability and Risk Office (CSRO) is responsible for leading and shaping our ERM programme.

Our Executive Committee are responsible for their specific business unit’s risk profile and reporting any material risks to the Board for review and attention. They are also responsible for promoting a proactive risk management culture within their teams, taking risk factors into account when making key decisions and ensuring appropriate risk mitigations are in place and are effective.





Our Risk Management Policy has allocated risk-related roles and responsibilities across the business and has established an ERM framework.

All employees have a responsibility to apply the ERM framework within their individual roles. This includes actively identifying, assessing, and managing risks in their business area and reporting any significant risks to the appropriate people.

Our ERM framework requires that the impacts of all identified risks, including those related to climate change, are assessed at a strategic level, business unit level and a project level, considering two variables: likelihood and consequence. The ratings reflect the impacts on a number of internal and external performance, external connection and value realisation measures and their occurrence over a period of five years.

We note that the time horizon over which climate change impacts are expected means a much broader set of risk management time frames are required to manage our climate risk. Through detailed scenario planning we are analysing how climate risk can be managed through to 2050, and beyond to 2100.

The ERM framework requires that the impacts of all identified risks, including those related to climate change, are assessed against the agreed consequence guidelines, at a strategic level, business unit level and a project level.

While climate-related risks are assessed across all consequence categories, climate-related impacts are explicitly called out for consideration under the following categories:

01 Physical climate change impacts and carbon impacts through our environment and community impact category.

02 Weather conditions and land use conversion through the business continuity impact category;

03 Social license to operate through the customer and reputation impact category; and

04 Transition to a low emissions economy and sustainability goals through the strategic impact category.

Our Risk Team has helped the business to develop business area-specific risk profiles and opportunity action plans. Climate-related risks have been identified as part of this process and these will be monitored and managed on an ongoing basis as part of the ERM framework.

A climate-related risk and opportunity profile has been established alongside our new Sustainability Action Plan and this will help us to further mitigate and adapt to climate-related risks and act on opportunities identified.

In building out these risks and opportunities the Risk and Sustainability Team continues to look to the work of the Climate Change Commission (CCC), Government policy including He Waka Eke Noa, the Climate Leaders Coalition, The Aotearoa Circle, briefings and advice from climate change specialists, reports produced by government agencies and the United Nations, climate related consumer insights and market analysis insights.



04

Strategy

Under TCFD, we are required to:

- Describe the climate-related risks and opportunities Silver Fern Farms has identified over the short, medium, and long-term.
- Describe the impact of climate-related risk and opportunities on the Silver Fern Farms' businesses, strategy, and financial planning.
- Describe the resilience of Silver Fern Farms' strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.



Physical Impacts

Physical climate impacts arise from extreme weather events (e.g. storms, flood, drought) or from the longer-term shifts in climate patterns (e.g. increasing temperatures and changes to the grass curve). These changes may result in financial risks or opportunity due to the direct and indirect impacts they can have on the business operations, assets, markets, or supply chains.

Transition Impacts

Transitional climate impact refers to risks and opportunities resulting from policy, legal, technology and market changes occurring in the transition to a low carbon economy. Depending on the nature, speed, and focus of these changes, transition impacts may pose varying levels of financial and reputation risk or opportunity.



Impact Narrative

According to the IPCC’s 2022 report, climate change impacts in Aotearoa New Zealand are occurring now and future risks are high. The report finds that unless global emissions peak in 2022, the 1.5°C limit for global warming is likely to be significantly exceeded.



The IPCC states that while losses and damage to human systems and ecosystems will potentially be less if we can take immediate action and limit global warming to 1.5C, physical climate impacts are not completely avoidable as some as now “locked in”.

We have utilised two scenarios to assess the impact of climate change on Silver Fern Farms:

At current levels of 1.1°C above pre-industrial temperatures, climate change is already affecting New Zealand’s natural and managed land and water systems, coastal areas, glaciers, and oceans. Impacts include extreme weather, heat waves, heavy and more frequent rainfall, droughts, fire, changing seasons and sea-level rise. Many of these are predicted to be widespread, systematically pervasive, and potentially irreversible, if average global temperature rises by 1.5–2°C.

01 **RCP 8.5**
Emissions continue to rise throughout the 21st century.

02 **RCP 2.6**
Emissions begin to decline in 2022 and get to zero by 2100.

	RCP 8.5	RCP 2.6
Climate variable	Magnitude of change	Magnitude of change
Mean temperature	By 2040 +1C. By 2090 +3C.	Warming trend peaks and then declines. By 2040 +0.7C. By 2090 +0.7C.
Daily temperature extremes	By 2040, a 50% decrease in cold nights and a 100% increase in hot days. By 2090, a 90% decrease in cold nights and a 300% increase in hot days.	By 2040, a 30% decrease in cold nights and a 40% increase in hot days. By 2090, a 30% decrease in cold nights and a 40% increase in hot days.
Mean precipitation	Substantial variation around the country. Greater magnitude of change than under RCP 2.6.	Substantial variation around the country. Less substantial change than under RCP 8.5.
Daily precipitation extremes	By 2090 up to 10 or more dry days per year (a 5% increase). More than 20% increase in 99th percentile of daily rainfall by 2090 in South West of South Island. A few percentage decreases in north and east of North Island.	Less substantial increase in dry days per year than under RCP 8.5. Less substantial increase in daily rainfall extremes than under RCP 8.5.
Drought	By 2090, up to 50mm or more increase per year, on average, in July–June.	Change is not expected to be considerable, risk is low.
Relative humidity	Up to 5% or more by 2090, especially in the South Island.	Minimal change.



Physical Risks

Silver Fern Farms is 100% made of New Zealand. Physical climate impacts could have a significant impact on our business but may also present opportunities for innovation, growth, and new forms of value.

The physical impacts of climate change most material to Silver Fern Farms are described in the following pages, alongside our initial responses.





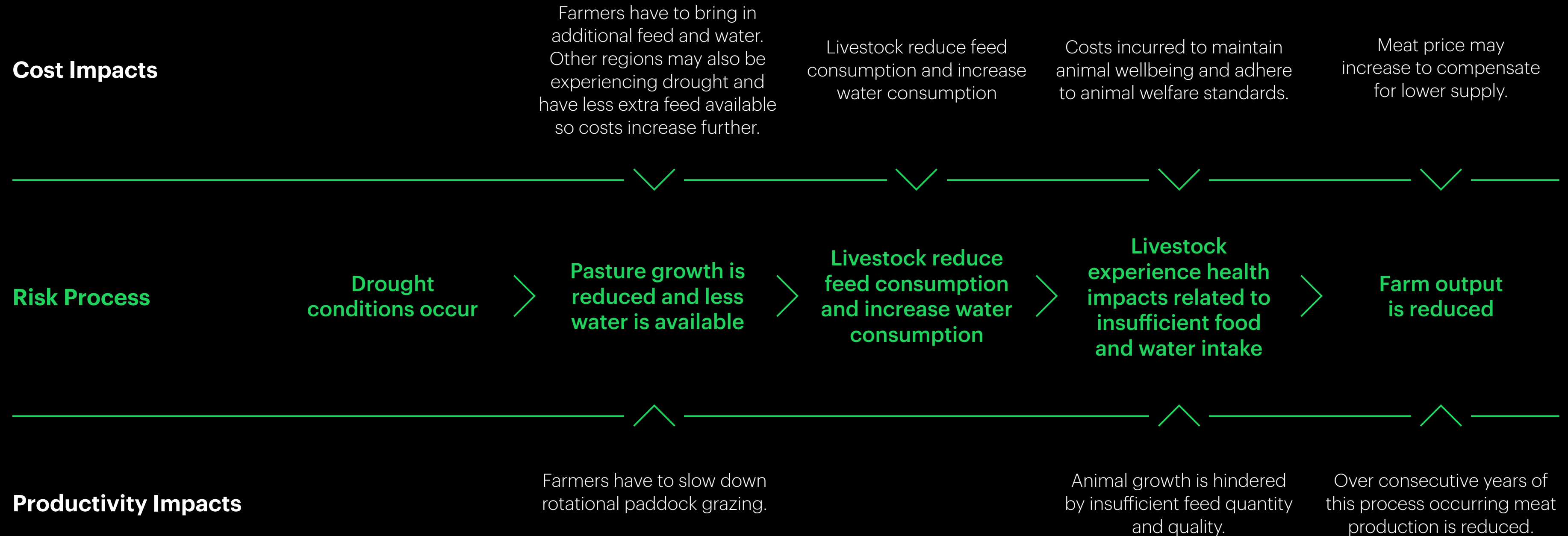
RISK

Impacts on the level and timing of livestock supply

Our existing business model relies on supply of livestock from New Zealand farmers.

The impacts of climate change, including heatwaves, floods, more prevalent extreme weather events, sea level rise, increased average temperatures and drought all threaten to impact the level, quality, and timing of supply.

This is through direct impacts on the health of livestock for example through heat stress, drought and flooding, indirect impacts on the health of the land and increasing levels of pests and changing patterns of supply as long-term weather changes impact on the ability to finish or supply prime stock.



RISK

Impacts on the level and timing of livestock supply

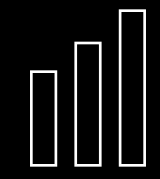
These impacts are likely to reduce productivity and could also reduce the attractiveness of sheep and beef farming resulting in the conversion of farming land to other uses, further reducing our supply.



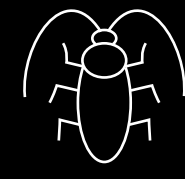
Risk of decrease in annual pasture production.



Increased risk of heat stress for animals.



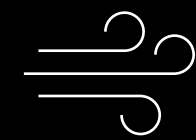
Increase in annual pasture production but a change to the pattern of growth.



Change in the pests and diseases



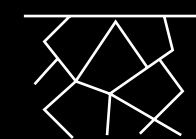
Wetter – increased winter and spring rainfall for the west of both islands. Increased intensity in rainfall events, increased flooding.



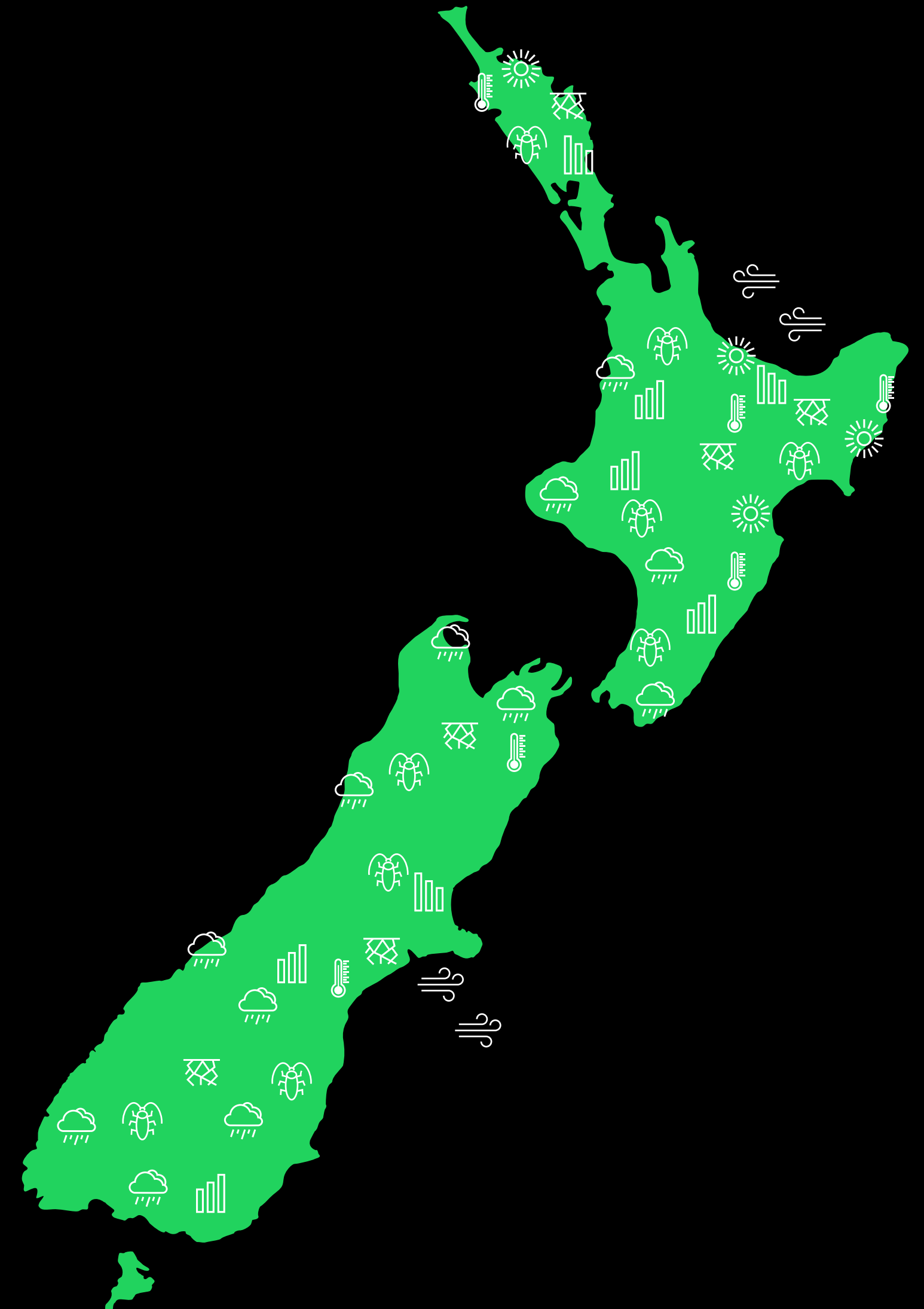
Wind – increased westerly winds in winter and spring in the south (particularly Canterbury and Marlborough), increased nor-easterlies in summer and autumn in the north.



Drier – more days over 25°, reduced rainfall, increased frequency and severity of drought.



Increased drought severity in most areas.





RISK

Impacts on the level and timing of livestock supply

Our supply and operational capacity mirrors the grass curve and thus through grass curve modeling, we are in the early stages of understanding this risk, especially:

- 01 Whether there will be greater seasonal variability in supply;
- 02 Whether the geographic location of our supply will change;
- 03 Whether volumes of supply will meet demand; and
- 04 The cost impact of supply changes in the future.

However, supply impacts have already been seen on the East Coast of the North Island where periods of increased flow of livestock have occurred during drought periods as it becomes increasingly difficult to feed and keep livestock at weight, followed by periods of reduced supply volumes as stock levels are built up again. In future this could impact our ability to plan and provide to market year-round.

These risks are likely to increase over time and they are greater under a high emissions scenario where the physical impacts are stronger.





RESPONSE

Impacts on the level and timing of livestock supply



01
We are developing programmes that concentrate on higher value products and new forms of value.

This should enable some price premiums to maintain overall profit margins given the likelihood that livestock suppliers will hold reduced numbers of livestock and allow premiums to be passed through to suppliers to incentivise land use to remain as is. Voluntary carbon offset contracts will create financial incentives for livestock suppliers to maintain and grow vegetation on farm. Nature based solutions such as this will reduce the physical impacts of climate events by creating shelter for livestock and

reducing waterlogging, wind, and water erosion problems.

02
We are supporting suppliers to help implement regenerative farming practices to build resilience and reduce the impact of climate change on land health. Premiums and contracts are also being realigned to reward supply in critical periods.



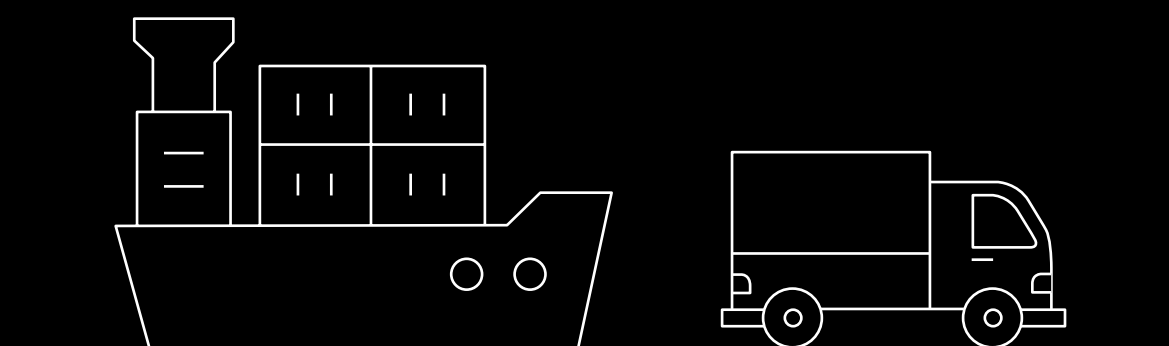
RISK

Disrupted transport network

A reliable transport network is critical to our business model as it is required to get livestock and staff to processing facilities, move waste from processing facilities and get product to our customers.

The impacts of climate change, including more frequent and extreme weather events, sea level rise and higher mean temperatures, threaten to disrupt and damage the transport network. Disruption to the roads and shipping ports will stop us receiving livestock from around the country and getting our products to our customers.

Extreme weather events such as storms combined with king tides are likely to increase temporary disruption to the transport network, especially coastal roads in New Zealand. This could potentially lead to:



01 Animal welfare issues if livestock cannot be removed or fed in periods of drought or flood;

02 Increased travel times for animals to processing sites and the animal welfare impacts;

03 Inability to access and operate the processing sites;

04 Spoilage of product if product cannot be removed from plant in a timely manner and cold storage availability is also impacted;

05 Reduced ability to meet demand of customers and fulfil orders on time;

06 Site contamination if waste cannot be treated or removed; and

07 Higher transport costs as transport is diverted to alternative routes.

In the second half of this century, sea level rise and increased temperatures are expected to lead to long term or permanent damage to assets such as ports or the Cook Strait ferry crossing and further amplify the impacts of extreme weather events. Previous disruptions include bridge collapses because of flooding near our processing site at Pareora.

Under RCP 8.5 where the physical climate impacts are more prevalent, this risk is higher. According to the NZ National Climate Change Risk Assessment, the exposure to physical climate hazards experienced by New Zealand roads, and ports varies. Ports are currently considered to have limited exposure to climate hazards; however, this increases to a moderate exposure in 2050 and major exposure by 2100. Roads, on the other hand, are already considered to have a major exposure to climate hazards through to 2050 and extreme exposure by 2100. Under a low emissions scenario, this risk is expected to be significantly lower.

Our participation in a global marketplace poses the additional risk of global supply chain disruption because of climatic events and the impact this has on getting our product to customers on-time. We are currently in the early stages of understanding this risk to our business but disruptions due to the COVID-19 pandemic have provided us with experience in managing significant disruption successfully.



RESPONSE

Disrupted transport network

01 Our shipping joint venture, Kotahi, enables us to have more control over shipping capacity and availability reducing the impact of global shipping shortages.



02 End to end vendor and supply chain due diligence also helps mitigate against this risk by identifying the best partners to reach customers and provide assurance as to the reliability of our supply chain.

03 'Livestock Transport' optimisation tool has integrations with live road closures allowing us to re-plan and optimise the best route, minimising transport disruptions on livestock flow.



RISK

Impaired Processing and Warehouse Infrastructure

A core part of our business is the processing of beef, lamb, and venison at 14 processing sites located throughout New Zealand.

Physical climate change impacts such as more prevalent extreme weather, increased flooding events and sea level rise threaten to damage and disrupt operations at our assets. This may limit our ability to process stock, raising potential animal welfare risks, and causing flow on effects down our supply chain to customers and consumers.

Due to the expansive nature of our supply network and disparate location of processing sites, there are likely to be varying physical climate impacts depending on location.

Of most concern are our processing sites at Pareora on the coast and Finegand on the Clutha River. The processing site at Pareora has recently been affected by a storm event where large waves overcame the sea wall, flooding significant areas of the site.



The physical risk posed to buildings is expected to be much greater under RCP 8.5 than under RCP 2.6. According to the National Climate Change Risk Assessment, the exposure of New Zealand's buildings to climate hazards is already considered major and is expected to grow to an extreme exposure by 2050.

Damage from continued flooding caused by sea level rise and storm events may eventually render our high-risk buildings unusable or uninsurable from mid-century. These kinds of disruptions could have a longer-term impact on our operations.



RESPONSE

Impaired Processing and Warehouse Infrastructure

Climate impacts are required to be identified and assessed for any project or capital expenditure. This was formally introduced in 2020 as part of our new ERM programme. This enables climate risks and opportunities to be considered when making decisions, for example, whether existing processing sites be upgraded and where to locate new processing facilities.





RISK

Disruption to energy and water access required for processing



Our processing operations require utility services (e.g. water and electricity) the supply of which could be disrupted by climatic events.

Increasing frequency of droughts impact both on the availability of water and hydroelectricity generation. The increasing frequency of extreme weather events is likely to also increase the frequency of power outages or lead to damage of electricity supply infrastructure that could impact several processing sites simultaneously.

This may limit our ability to process stock and keep our product at the required temperature causing flow on effects down our supply chain to customers and consumers.

Access to energy and water is likely to be more disrupted under RCP 8.5 than RCP 2.6. New Zealand's National Climate Change Risk Assessment considers risks to electricity infrastructure as moderate currently, rising to major in 2100 whilst it considers risks to water supplies as major currently, rising to extreme by 2050.



RESPONSE

Disruption to energy and water access required for processing



01

Through our carbon reduction ambition, actions have been taken to make our operations more energy efficient, reducing the overall requirement for energy and water and thus our vulnerability to any water or electricity restrictions that may be introduced.

02

12% ↓

Target reduction on 2021 water use intensity by 2024

We have operational plans to achieve this including through installation of sensors in washdown areas to reduce water use.

03

Developing a blast freezing resilience plan to reduce the risk of spoilage due to power outages.



04

Refreshed business continuity plans are also in development. This has involved identifying critical processes, real-time operating plans, and manual workarounds. Current back-up arrangements exist which include moving stock to other processing sites and toll processing back-up arrangements.





RISK

Damaged wastewater and stormwater infrastructure or inability to discharge waste

It is critical that we discharge wastewater and stormwater appropriately to avoid effluent and pollutants entering waterways and the regulatory and public response to such an event.



Wastewater and stormwater infrastructure are at risk from extreme weather events (including heavy rainfall), ongoing sea-level rise and floods, the impact of which could include wastewater and stormwater overflows resulting both in effluent and pollutants. Additionally, drought will impact our ability to discharge wastewater with restrictions at low flows. This could impact on the volume / strength of wastewater that is able to be discharged and could cause disruption to processing.

Of most concern are our processing sites in coastal areas or close to major waterways.

The physical risk to wastewater and stormwater systems in New Zealand due to extreme weather events and ongoing sea-level rise is already deemed major by the Ministry for the Environment, so under both RCP 2.6 and 8.5 the risk is high. By 2050 exposure is likely to be extreme.



RESPONSE

Damaged wastewater and stormwater infrastructure or inability to discharge waste



01

Upgrading wastewater systems, in particular there are wastewater improvement plans in place at Pareora and Dargaville. These upgrades will see wastewater discharged to land (not sea) where possible.



02

Climate impacts are required to be assessed under the new ERM framework for new infrastructure projects. This will enable us to make decisions that minimise climate risk when deciding whether to upgrade existing processing sites and where to locate new infrastructure.

03

Quantitative modeling of sites located near waterways to better understand the potential physical climate change impacts on plant infrastructure, including wastewater and stormwater systems.



RISK

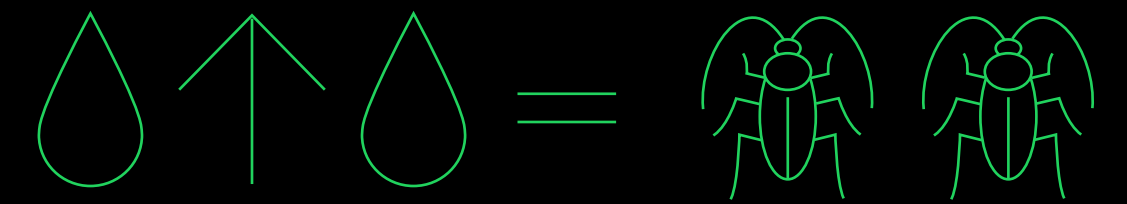
Food health and safety impacts as a result of increasing pest and disease spread

Food health and safety is of utmost importance to us and since 2016 we have had a 100% record for food safety with zero recalls.

Higher mean temperatures, humidity and other changes to the climate are likely to increase the number of insect pests in New Zealand and the microbial loads on livestock and lead to agents currently used to suppress pest numbers failing, making it more difficult for us to maintain our 100% record for food and safety.



An insect infestation or microbial outbreak would cause massive business disruption, with closures required for extermination and cleaning, product loss and wastage and the resulting impacts down the supply chain.



Reputational risks also exist if the food safety issue was not identified prior to the product going to customers. We note that this risk is likely higher under RCP 8.5 than RCP 2.6.



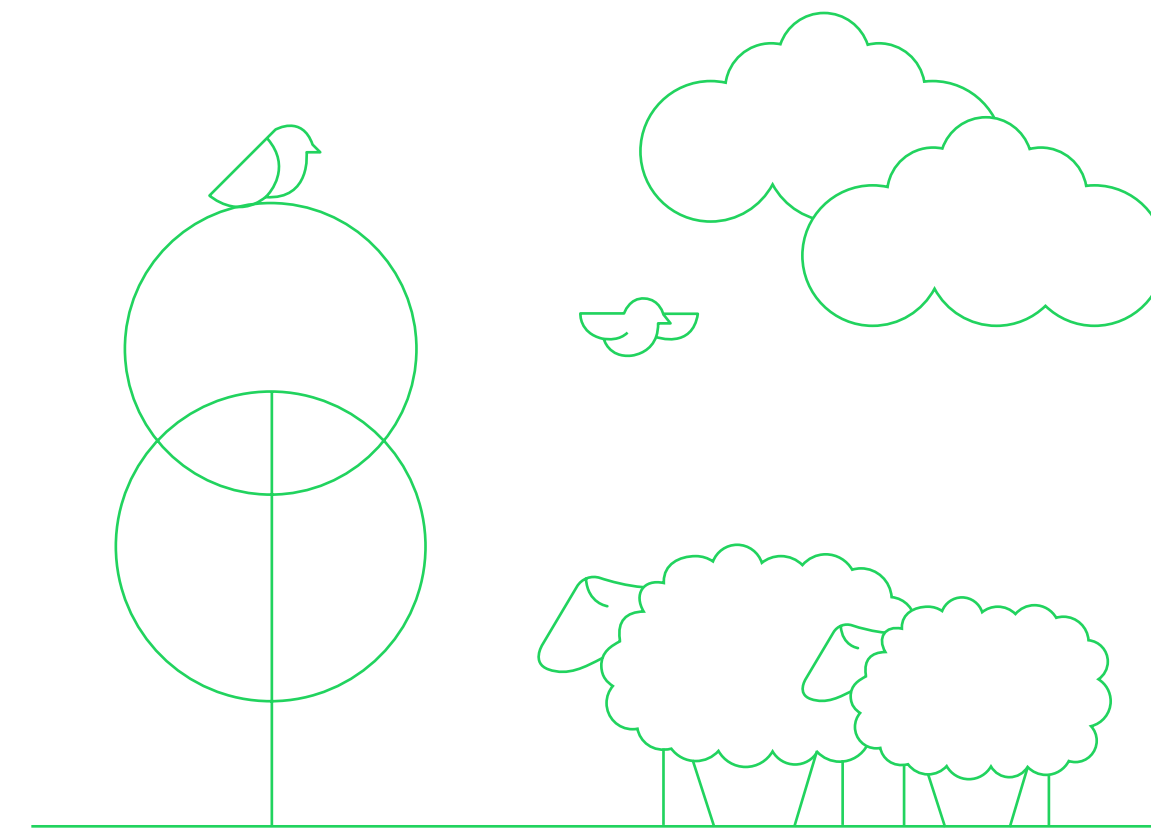
RESPONSE

Food health and safety impacts as a result of increasing pest and disease spread

01 All processing sites have a Risk Organism Response Programme detailing traceability systems, livestock controls, product controls, personnel controls, and cleaning / disinfection procedures. These are reviewed annually.



02 Our products are subject to NZ Food Safety System Standards. Routine sampling for pathogens is conducted by the National Microbiological Database programme to ensure standards are met.



03 We are certified under the National and Global Food Safety Initiative Standards ("GFSI"). GFSI accreditation is a global standard for the safe and ethical production of food.



04 Our Food Quality team complete due diligence of all third-party or co-processors of our branded products to ensure food safety programmes and controls are in place which are routinely verified. Third-party or co-processors are also expected to have GFSI certification or be working towards it.





RISK

Increased demand for cold chain storage capacity

Cold chain management is a key requirement of our manufacturing process. There are cold chain distribution constraints across New Zealand already and increasing temperatures because of climate change will likely compound this with more food types requiring cold chain distribution to maintain their quality and safety.



Increasing temperatures will also require more energy to keep our facilities at appropriate temperatures unless cool-store facilities are upgraded.

An inability to access sufficient cold chain storage capacity would result in reduced operational capacity and/or spoilage of product and an inability to meet the demand of our customers and fulfil orders on time and to specification. The requirement for more energy to keep our facilities at the necessary temperatures will make it more challenging for us to meet our carbon emission reduction targets if the increased requirement is not addressed through renewable energy sources and will increase operational costs.



RESPONSE

Increased demand for cold chain storage capacity



Development of a future fit cold storage network by leveraging existing assets and strategic relationships supported by automation and process improvement.



Transition Risks

The transition impacts of climate change (such as changing customer behaviour or rapid shifts in the climate policy space) present risk, as well as opportunity for our business. We are already seeing the rise of the conscious consumer, customers who want their red meat to be sustainably produced and processed, and expect a strong evidence base to in-market claims. Climate action both in New Zealand and internationally also has potential impacts including the increasing pace and scale of commitments, reforms and advice on climate action pathways including planetary-based diets. On the opportunity side, climate action can be a driver for innovation and is accelerating the creation of new forms of value in the primary sector in New Zealand, and internationally.

We rely on a wide range of sources to assess the potential impact of New Zealand's transition to a low-emissions economy on our business.





RISK

Impacts on the quantity and cost of livestock supply

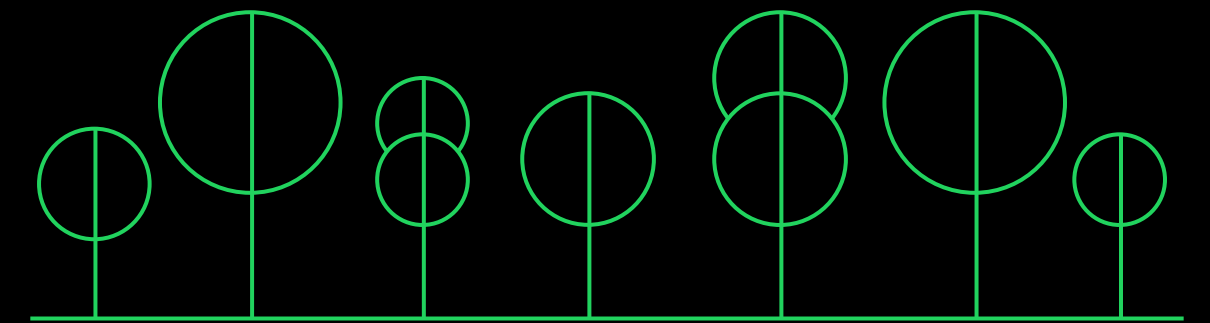
Livestock is the primary input into our supply chain. The impact of increasing levels of climate policy and the cost of implementation, regulation fatigue, the rising price of NZ units (NZUs) under the Emissions Trading Scheme (ETS), and potential for reduced access to capital for our livestock suppliers are likely to impact the level and cost of supply. This is through direct costs being passed through the supply chain and through land use change driven by these impacts. Additionally, there is risk to our supply of livestock if our suppliers are unwilling or unable to adapt to our transition measures, for example regenerative agriculture principles, or NZFAP+ certification.



He Waka Eke Noa will increase emissions reporting requirements which will increase operating costs. A price on agricultural emissions will increase costs either through paying for emissions, planting trees to sequester carbon and/or investing in new technology to reduce livestock emissions. New freshwater management and winter grazing regulation, put in place to protect the environment because of impacts already seen by climate change, will further increase regulatory obligations and farmer costs. For example, winter grazing requirements may impact the ability of suppliers to get stock up to weight and reduce the herd size carried over winter, having a negative flow on effect to our ability to supply consumers throughout 52 weeks of the year and increasing the price we pay for livestock in months where there may be reduced supply.

Capital providers are increasingly considering the impacts of climate change in their lending and investing decisions. Here in New Zealand, the Sustainable Agriculture Finance Initiative (SAFI) guidance has been created to guide the finance sector in decision-making for funding within the primary sector. Given the physical impact of sheep, beef, and deer on natural capital, this will impact accessibility and cost of debt for livestock suppliers not willing or able to shift to sustainable farming practices.

Conversely, the rising price of emissions increases the profitability of carbon farming. It incentivises the conversion of pastoral land into exotic forestry, primarily pinus radiata. From the beginning of 2017 to the end of 2021, the estimated area of land that has been or will be planted soon is 139,500ha.



Beef and Lamb NZ estimate that this accounts for the loss of around 700,000 stock units to the sector. The current price of emissions within the NZ ETS is \$75/tonne, with the CCC suggesting that prices could need to reach at:

\$140 per tonne
by 2030

\$250 per tonne
by 2050

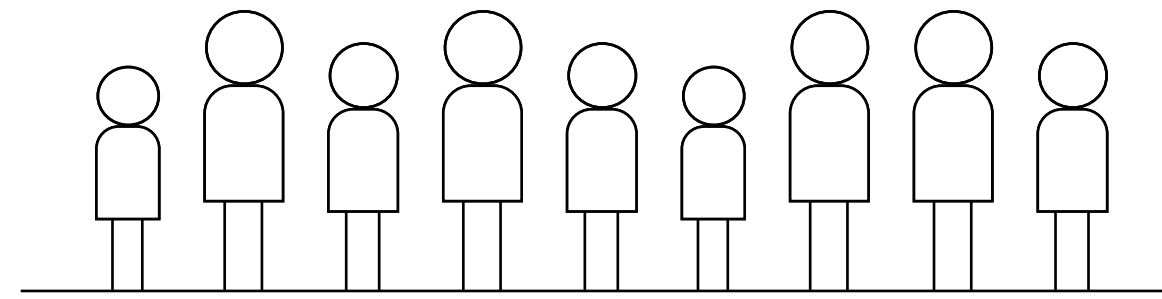
if the Government is to meet its domestic and international obligations.



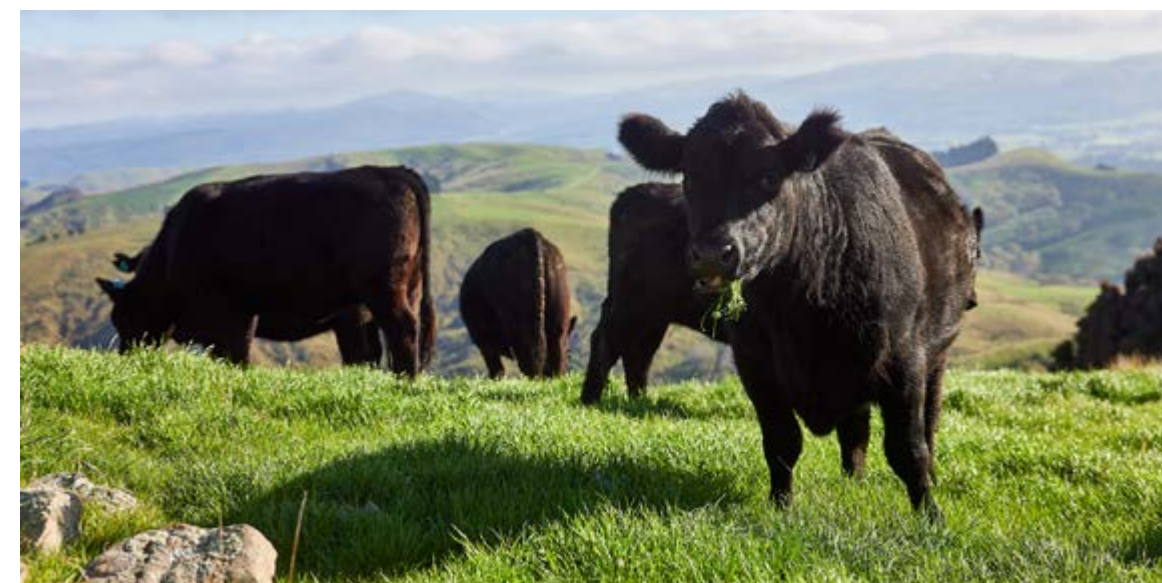
RESPONSE

Impacts on the quantity and cost of livestock supply

01 Growing the team which provides support and guidance around future compliance requirements to our suppliers.

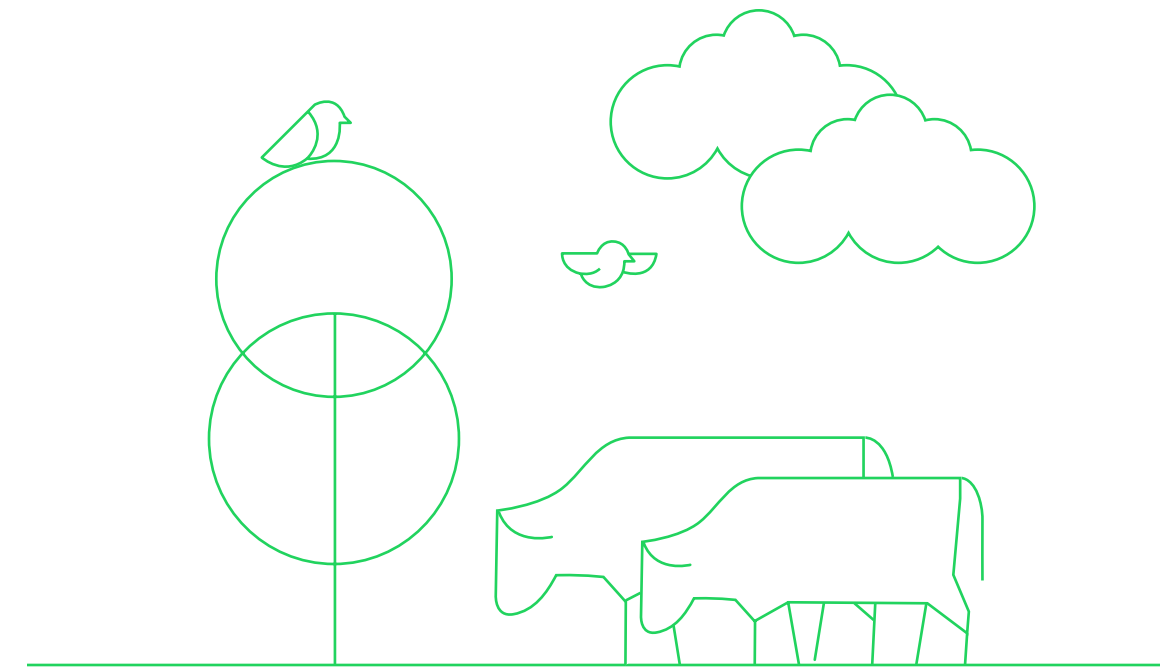


02 Involvement in the industry response to climate change commitments under He Waka Eke Noa through the working group co-managed by industry and Government.



03 Involvement in SAFI, an initiative to help livestock suppliers meet the required standards to enable access to finance into the future.

04 Partnership with AgResearch and universities to collaborate on research for low emission breeding of livestock is also an exciting opportunity to help New Zealand farmers reduce their emissions.



05 Leveraging our market-led strategy to provide value per kilo back to suppliers. This included the launch of Net Carbon Zero certified beef products into the US market in January 2022.



The key to this programme is voluntary carbon offset contracts that will create financial incentives for livestock suppliers to maintain and grow vegetation on farm to sequester carbon. The intention is to scale this programme up over the next three to five years. Through initiatives like this we aim to incentivise livestock suppliers to keep land in pasture by providing a legitimate value proposition.

06 Fifth quarter business is utilising previously wasted parts of the animals to create new and sometimes higher value premium opportunities in pet food, nutraceutical, and pharmaceutical applications.





RISK

Increased transportation costs as a result of increased carbon costs

Transport is required to get livestock to processing facilities, move waste off our processing facilities and get product to our customers.

We are already seeing the impact of international regulation on shipping, with the International Maritime Organisation (IMO) putting a limit on sulphur content in fuel oil to improve air quality in 2020. The price difference between low and high sulphur fuels and the cost of installing scrubbers is expected to drive the price of freight up. An increased carbon cost will increase our suppliers' fuel costs further and thus our logistics costs.

Of interest is whether increasing costs for supply chain partners as a result of carbon price increases will affect New Zealand's access to markets overseas.



An inability to access sufficient cold chain storage capacity would result in reduced operational capacity and/or spoilage of product and an inability to meet the demand of our customers and fulfil orders on time and to specification. The requirement for more energy to keep our facilities at the necessary temperatures will make it more challenging for us to meet our carbon emission reduction targets if the increased requirement is not addressed through renewable energy sources and will increase operational costs.



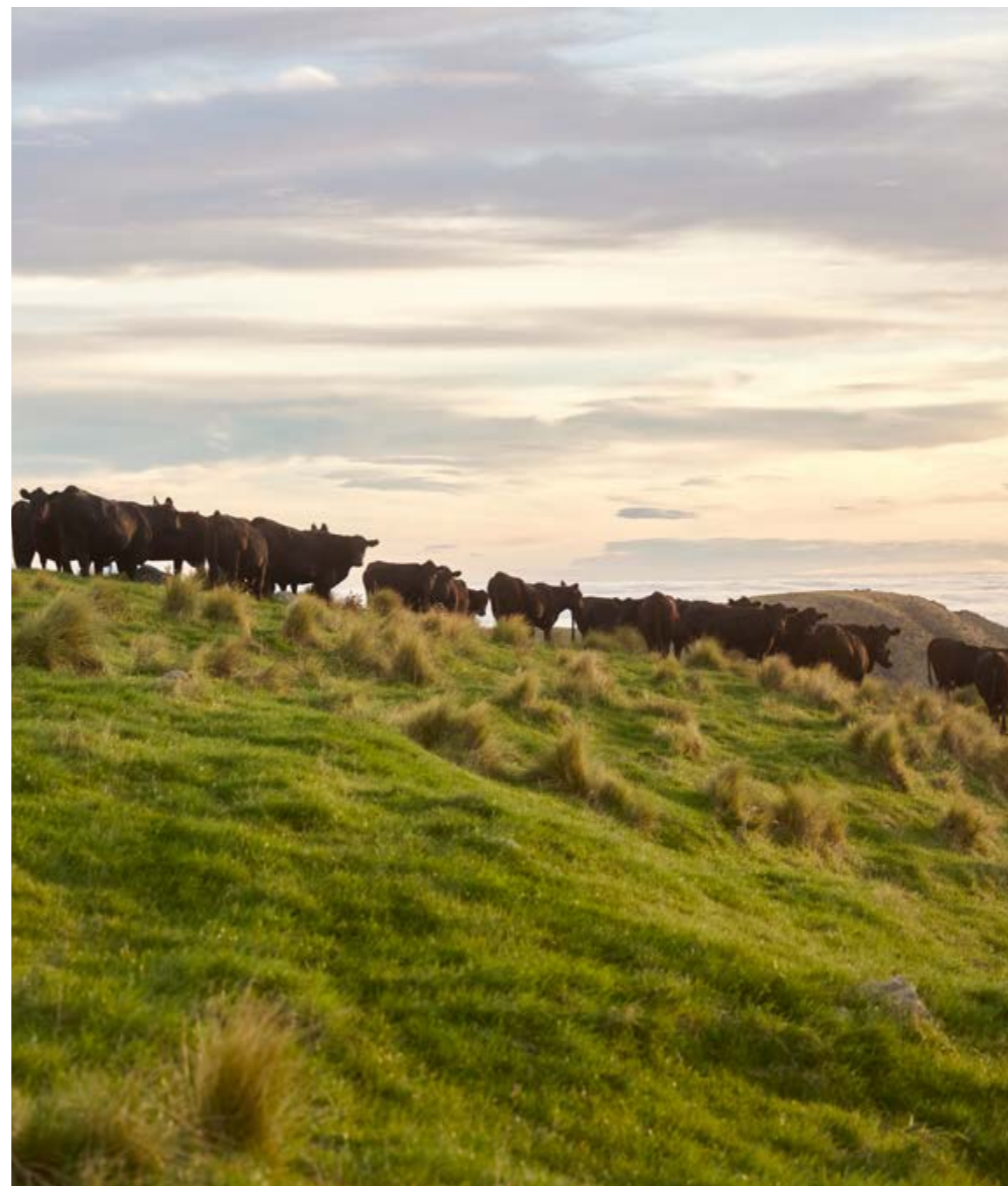


RESPONSE

Increased transportation costs as a result of increased carbon costs

01

Optimisation of livestock transportation to reduce the overall distance travelled, thereby reducing emissions and delivering improved animal welfare outcomes. To date this work has seen savings in the distance travelled of 370,000km, a reduction in carbon emissions of 7% and a reduction in the average distance an animal spends on a truck by 11% in the regions where this optimisation has occurred.

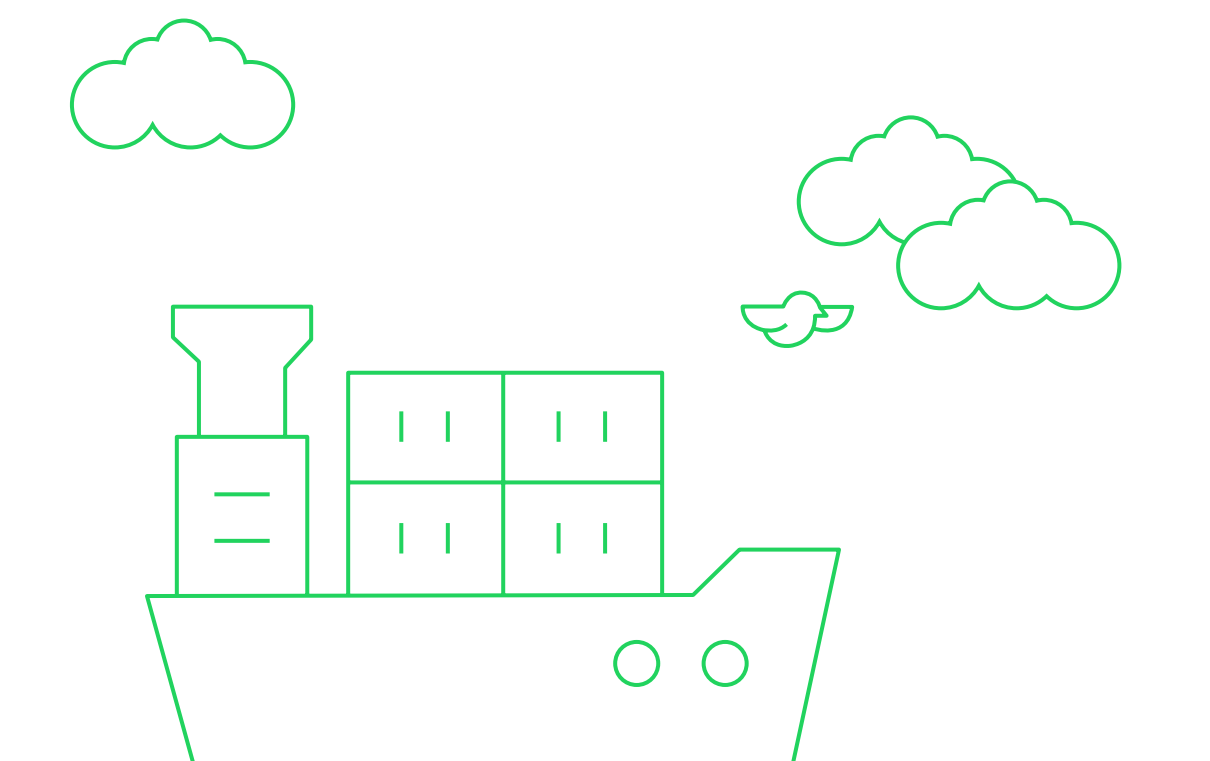


02

Shipping joint venture, Kotahi, also enables us to reduce emissions per container by pooling volumes and through our partnership with industry leader Maersk, who are aiming to have a carbon neutral fleet by 2050.

03

Kotahi also enables us to have more control and thus experience less disruption as a result of climate-related impacts on global supply chains.





RISK

Increased processing and warehouse costs as a result of climate change policy and carbon costs

Changing climate policy and regulation as we transition to a low-emissions economy will impact processing sites given increased compliance costs and upgrade requirements.

Landfill closures or increases in landfill rates will increase operational costs if waste reduction practices are not implemented successfully. The majority of our 14 processing sites still rely on some form of fossil fuel as an energy source. Where we are not able to reduce our GHG emissions within our processing sites, there will be a resulting operational cost given the projected rise in price of NZUs.

Additionally, maintenance and construction work are likely to increase in cost due to embedded carbon in cement and steel and the projected rise in price of NZUs.

Six of our 14 processing sites are coal powered and significant capital investment is needed to move these facilities away from fossil fuels, with transition costs projected at \$33.8m.





RESPONSE

Increased processing and warehouse costs as a result of climate change policy and carbon costs



Zero coal usage by **2030**

01 Committed to an energy transformation process to achieve a clean efficient energy strategy away from fossil fuels with zero coal usage by 2030 and have adopted a science-aligned target to decarbonise our energy use. This will require investment over the next 10 years for demand reduction, heat pump projects and boiler replacements.

02 New Zealand's largest multi-site business to partner with EECA.

03 Exploring alternate waste solutions, including composting, sales of raw material, developing new rendering technologies, collagen/lanolin/keratin extraction, waste to energy options and sending farm gate price signals to avoid waste production at source mitigating the risk of increased waste costs.



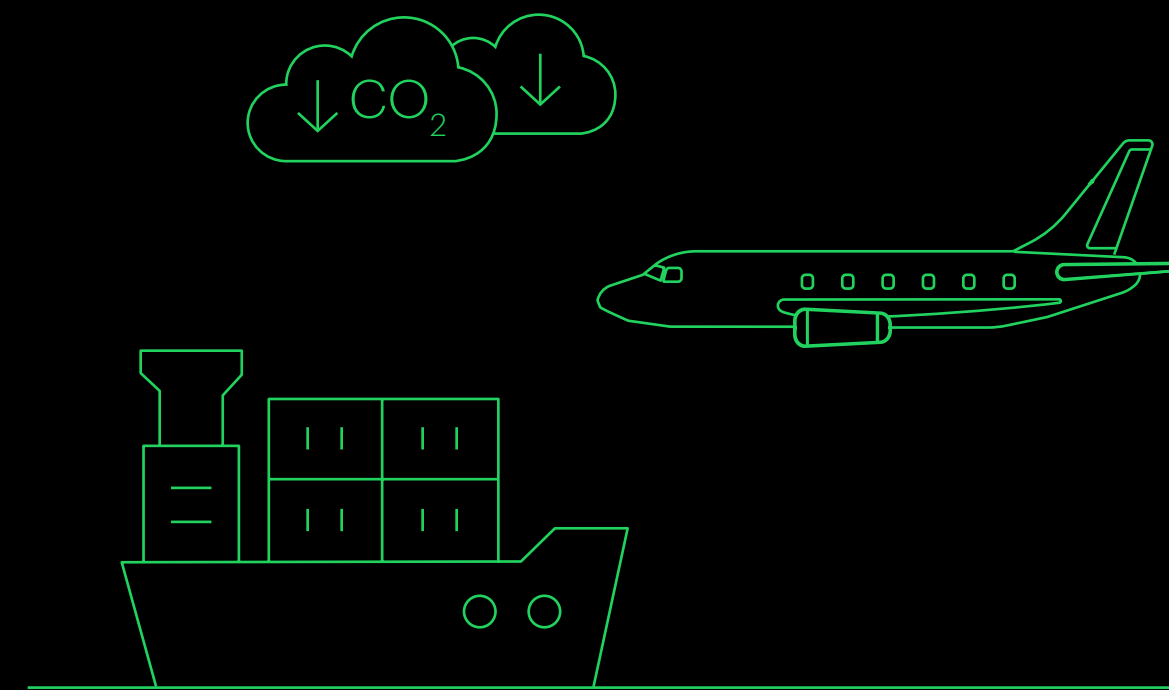
RISK

Impacts on access to global markets as a result of transitioning to a low-emissions economy

Global climate change policy and regulation will impact our ability to access markets.

This could be either through increased regulation cost associated for example with increased labelling requirements and carbon border adjustment mechanisms or through an inability of our supply chain partners to keep up with policy and regulation requirements.

Environmental labelling at product level of scope three emissions in overseas markets could create barriers to access of new and/or existing markets as it would require us to have measured scope three emissions and to have supply chain carbon traceability measures in place.



Carbon border taxes (such as the EU's Carbon Border Adjustment Mechanism - CBAM) may put us at a disadvantage in the market from a price-point perspective.

CBAM will put an import levy on goods coming into the European Union based on emissions content and carbon pricing schemes in the export country by as early as 2023. It currently excludes agriculture, but this boundary could be expanded in the future.

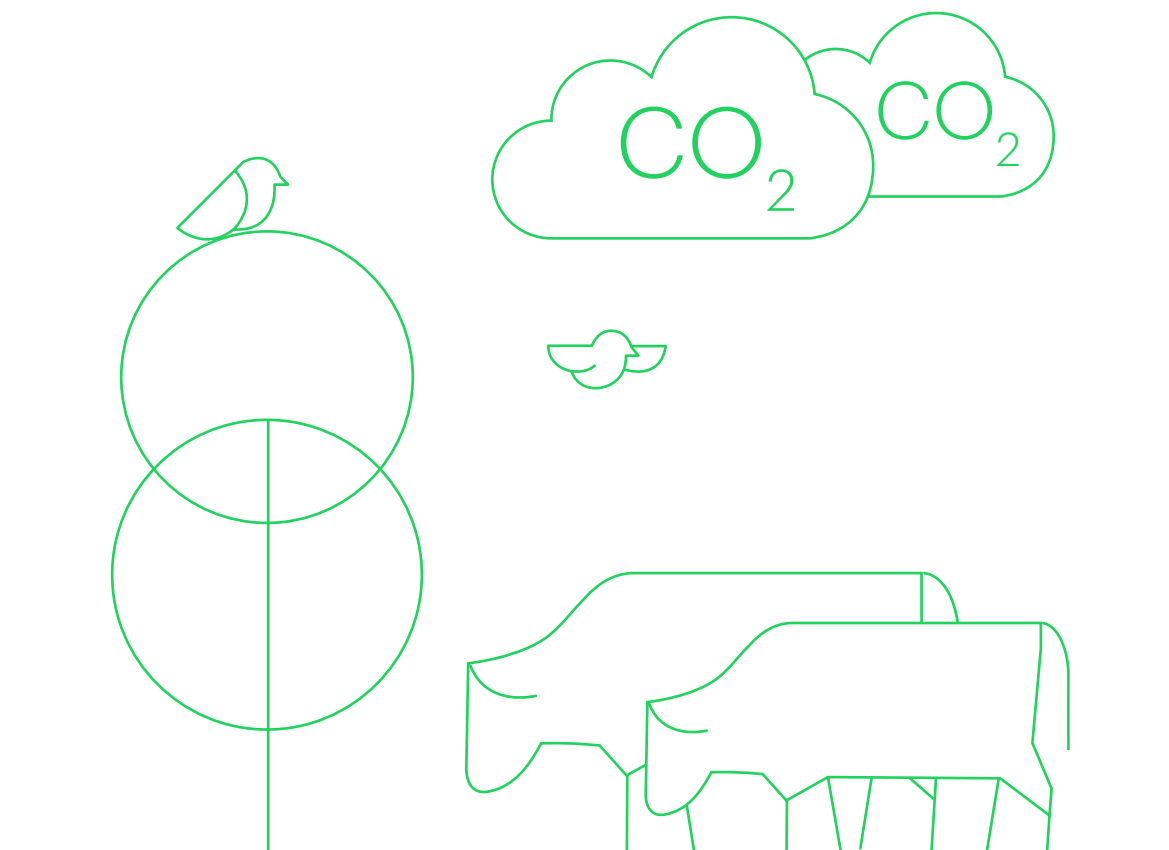
There is risk that third-party providers and supply chain partners will not be able to keep up with changing regulatory requirements in their operating markets impacting on our ability to access the market.



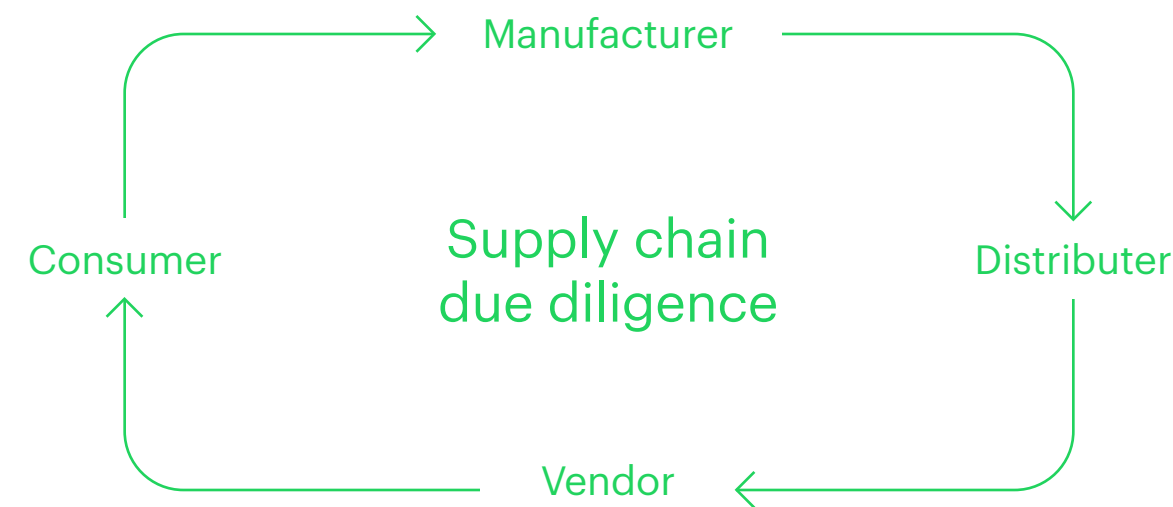
RESPONSE

Impacts on access to global markets as a result of transitioning to a low-emissions economy

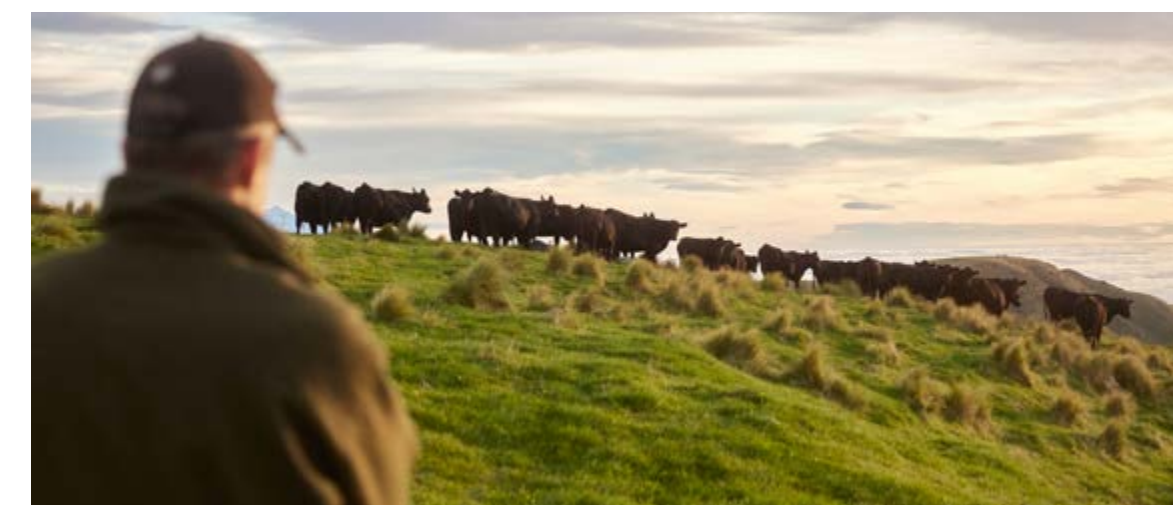
01 Emissions reduction pilot programme in 2019 with 17 farms across New Zealand, which has enabled us to increase understanding of baseline farm emissions, sequestration levels and opportunities for reduction of emissions on farm. From our learnings on this project, we hope to have a verified scope three emission profile and target in place in the next 12 months. The requirements for farmers to measure their GHG emissions under He Waka Eke Noa will make the measurement of scope three emissions much easier going forward and there is also the potential to expand our supply chain traceability programme to include GHG emissions.



02 End to end vendor and supply chain due diligence is in place to help us identify partners already adopting climate protection steps and thus those that will be most able to comply with climate regulation.



03 Climate awareness is part of our vendor selection and management process for non-procurement livestock and will be embedded through our Supplier Responsibility Standards which are currently being developed.



04 Focus on less commoditised, higher value products differentiates our products in the market.



05 Silver Fern Farms is a founding partner in the Government-Industry Joint Venture (JV) which will help accelerate methane reduction solutions into the hands of farmers through a commercial focus. The JV is a 50:50 long-term partnership with industry partners investing up to \$50 million a year, matched by the Government. It's important to acknowledge the research that has already occurred to date in New Zealand; the role of the JV will act as a catalyst for this, and being a founding partner in the JV will help keep our place at the cutting edge of any developments in this important field.



RISK

Impacts on demand as a result of consumer preference change towards low emissions products and increased availability of meat alternatives

Consumers are becoming more conscious of the impact their consumption has on the environment.

This leads to the likelihood of increasing rates of vegetarianism and veganism, and more demand for low emissions products and transparency in relation to emissions.



A 2020 Colmar Brunton poll found that climate change is a real concern for 52% of New Zealanders and found:

49% Of New Zealanders agree that diet change is required to save the environment.

This trend is present in other important international markets, including the US where a Pew Research poll found:

57% of American adults said they eat less meat every day to protect the environment.

Reflecting this change is the proliferation of alternative and synthetic proteins which threaten to disrupt traditional protein industries as they become cheaper over time.



This has the potential to reduce demand for our products based on the assumption that cultivated meat will increase in availability and reduce in cost.



RESPONSE

Impacts on demand as a result of consumer preference change towards low emissions products

and increased availability of meat alternatives

01

Our marketing strategy to drive premium brand positioning at the less elastic end of the market and to target premium customers and consumers, helps insulate us from this.



02

However, we are still taking this risk seriously and are in the process of creating low emissions products, for example the Net Carbon Zero beef product launched into the US in early 2022 and Net Carbon Zero Lamb will be launched later this year.



03

Longer-term, an R&D framework is being developed. This will enable more research activities like the work we are doing with scientists at Lincoln and Duke Universities to understand the positive links between red meat consumption and health.

04

Our regenerative agriculture initiative aims to shift consumer perspectives that red meat has negative environmental outcomes by tying ruminant animals to positive environmental outcomes.

05

We are also investigating packaging reduction initiatives and end of life options with our long-term packaging partner, Sealed Air.





RISK

Impact on demand as a result of perceived inaction on climate change

Increasing levels of public awareness about environmental and climate issues pose a risk to the reputation of companies who do not act to mitigate both their impact on the environment and the climate.

Our customer and consumer-led approach is the driving force behind the transition to our low-emissions future. We are seeing indications from customers that those not acting on climate change will lose preferred vendor status.





RESPONSE

Impact on demand as a result of perceived inaction on climate change

Through partnerships and accreditations, we are demonstrating to the public that we are acting on climate change, for example:

01 Toitū carbonreduce certification for us as an entity with a certified carbon footprint for 2018, 2019, and 2020. We have had a:

20% ↓ reduction in emissions since 2018.

02 Adoption of a science-aligned target with:

42% ↓ reduction in emissions by 2030

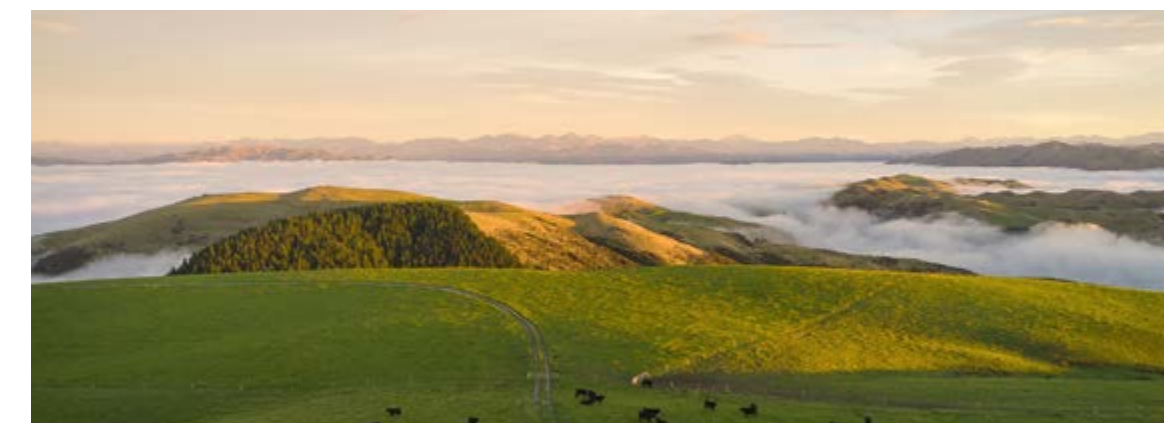
from a 2020 base year. Currently this only includes scope one and two emissions, but a science-based target will be developed for scope three emissions by the end of 2023.

03 Toitū Net Carbon Zero certification for Net Carbon Zero beef and lamb products.

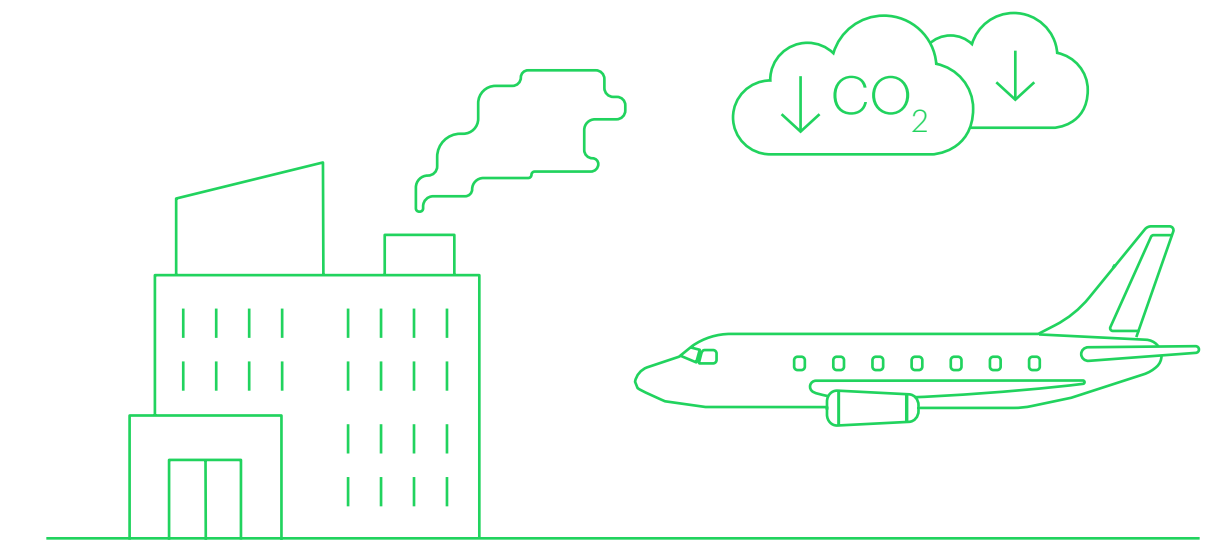
04 Our investment in the Government Industry Joint Venture to help accelerate methane reduction technology is an important initiative to pursue a lower footprint for our products.

05 Member of New Zealand’s Climate Leaders Coalition requiring public reporting and a commitment to reducing emissions.

06 Member of the Sustainable Business Council and of the Aotearoa Circle, both form groups of leading New Zealand companies working together for a sustainable New Zealand.



07 We have worked with EECA and Waikato University through the energy transition accelerator to develop a fossil fuel use reduction pathway and an energy use efficiency plan.



08 Working towards a partnership with Savory Institute to verify regenerative practices of our livestock suppliers.

09 Silver Fern Farms is a founding partner of the Kai Commitment. This commitment alongside a number of New Zealand’s largest food producers and retailers has a focus on food waste measuring and reporting within our control boundary and championing food waste reduction initiatives across our supply chain in New Zealand.



RISK

Impact on demand as a result of being perceived as 'green-washing'



There is risk of challenge by consumers, customers, livestock suppliers and/or the public that the environmental claims made on products do not match their environmental impacts.

If green-washing claims were made against us this could result in reduced demand for our products, losing preferred vendor status or even legal action for truth of labelling breaches.



RESPONSE

Impact on demand as a result of being perceived as 'green-washing'



01

Our partnerships and accreditations mitigate against the risk of greenwashing including with Toitū and Savory.

02

The Silver Fern Farms sceptics forum is an additional risk mitigant which provides exposure to market talking points to ensure authenticity in the market.

03

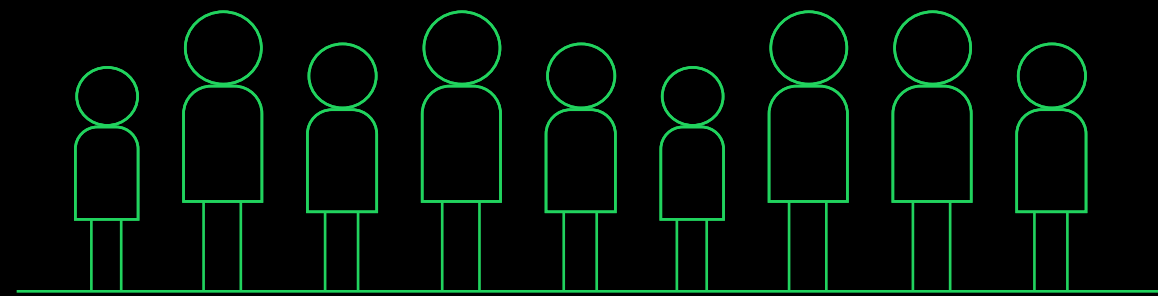
SEDEX and other customer assurance and verification schemes and due diligence requirements.



RISK

Greater levels of director liability in relation to climate change

Legal opinions in the UK, Australia, New Zealand, and Canada suggest that directors' duties of due care and diligence require them to factor climate change into their risk management and business decisions.



There is therefore a risk of legal action against companies that do not consider climate change when making business decisions. Further, quality Board members will be harder to attract in businesses where climate risk is perceived to be high and difficult to manage as they could become personally liable.





RESPONSE

Greater levels of director liability in relation to climate change

01 First Risk Management Policy was established in June 2021 and the RSC was established in December 2020. This has and will continue to give the Board greater visibility over climate related risks and issues to enable these to be considered in business, investment, and strategic decisions.



02 Through a number of initiatives we are showing action on climate change and reducing our climate risk profile.

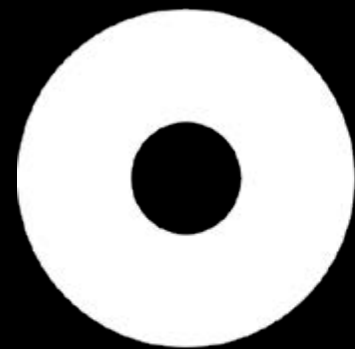


RISK

Reduced access to capital as a result of climate inaction

Capital providers are increasingly considering the impacts of climate change in their lending and investing decisions.

Here in New Zealand, the SAFI guidance has been created to guide the finance sector in decision-making for funding within the primary sector. SAFI is focused on aligning with emerging international frameworks, namely the EU Taxonomy and Climate Bonds Standards, to better support the flow of sustainable finance to the New Zealand agriculture sector.



Toitū Tahua
Centre for
Sustainable
Finance



Given our core business of procuring, processing, marketing, and exporting premium quality lamb, beef and venison is currently emissions-intensive, there is a risk of reduced access to, or increased cost of capital if we fail to show action on climate change and do not actively manage risks.

A further result of the economic transition may be that existing assets might stop earning a return earlier than expected at the time of investment – known as a risk of “stranded assets”.



RESPONSE

Reduced access to capital as a result of climate inaction



01

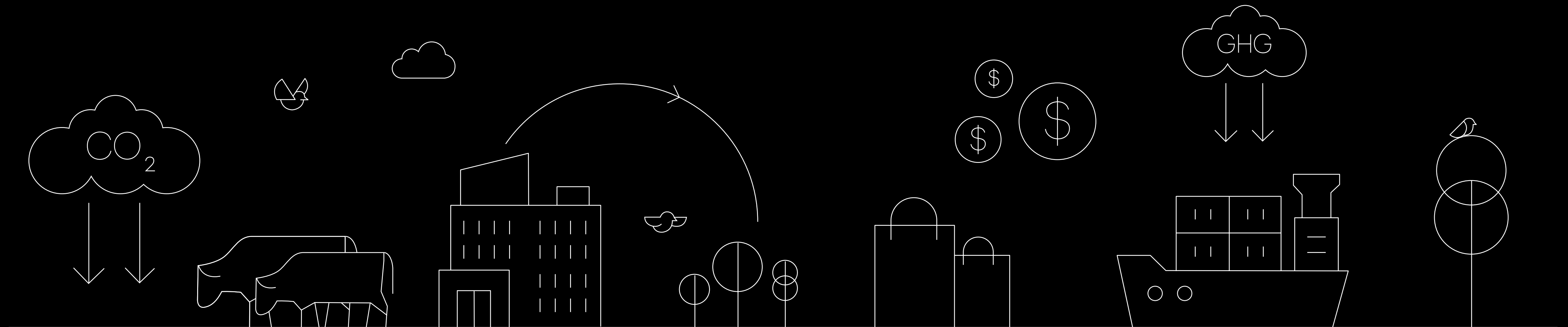
Our debt position provides us with a resilient balance sheet.

02

Partnered with ANZ, BNZ and Rabonank to establish a sustainability linked loan, which links our working capital facility to sustainability targets and climate ambition.



Opportunity





OPPORTUNITY

Low or Net Carbon Products

52% Of New Zealanders have a real concern about climate change.

49% Of New Zealanders agree that diet change is required to save the environment.

75% Of our livestock suppliers are concerned about climate change.

There is a willingness within our supplier group to convert non-productive areas of their farm to forestry and under He Waka Eke Noa they will be required to measure their on farm GHG emissions. Accordingly, there is an opportunity for us to develop products which reduce or sequester GHG emissions.

We launched a carbon pilot programme in 2019 with 17 farms across New Zealand, which has enabled us to increase our understanding of baseline farm emissions, sequestration levels

and opportunities for reduction of emissions on farm.



Following on from this, we developed a Net Carbon Zero beef product that was launched into the US in early 2022. These two initiatives work together by providing a Net Carbon Zero beef product using the carbon sequestered in the participating farms to offset emissions generated by production.

The aim is that this product will grow the market by changing perspectives that red meat is emissions intensive and thus has negative impacts on the environment. This product will enable us to maintain or grow our market share and improve margin both to incentivise beef and sheep farming in combination with other land use (rather than conversion) and improve our profit.

The current focus is on insetting.

That is using vegetation sequestration on farms to offset emissions of the product but there are also opportunities for us to help livestock suppliers reduce gross emissions and increase the efficiency of the red meat product system.

For example, by:

- Reducing the number of breeding beef cows through greater use of surplus calves from the national dairy herd;
- Accelerating the development and commercialisation of a methane vaccine;
- Accelerating the development and commercialisation of rumen modifying animal health remedies such as long-term drenches or boluses;
- Increasing pasture diversity and introducing low emissions feed into the grazing system;
- Improving efficiency of beef and lamb production and survivability of multiple lambs;
- Breeding low emission animals; and
- Moving away from 100% grass fed to enable low-emissions supplementary feeds to be introduced into livestock diets

Enhanced farm planning and developing a pathway to nature positive through enhanced biodiversity, improving soil carbon, excluding livestock from regenerating native vegetation and actively undertaking predator control will all enable sequestration to be optimized on farm without compromising livestock production.



OPPORTUNITY

Regenerative agricultural practices and products

Observed climate change is already affecting food security through increasing temperatures, changing precipitation patterns, and greater frequency of some extreme events. Impacts on protein availability as a result of climate change may take as many as 150 million people into protein deficiency by 2050.

A Kantar survey of 145 of our livestock suppliers found almost:

80% believe their farm systems and practices are regenerative.

There is therefore an opportunity to capitalise and improve upon the productivity and health of farmland and sustainability of farming practices in New Zealand relative to other jurisdictions to feed the world.

We are already supporting livestock suppliers to adopt or continue to implement regenerative agricultural practices to build farmer resilience, reduce the impact of climate change on farmland health and improve biodiversity.

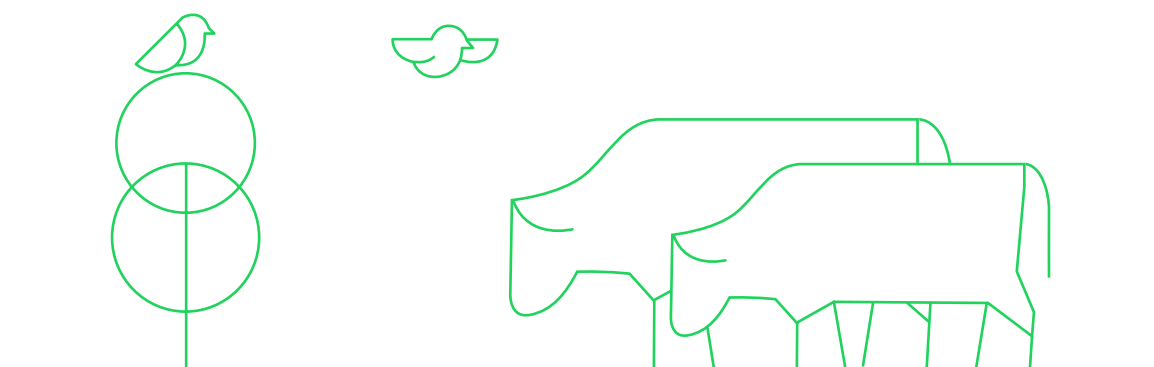
This includes through encouraging livestock suppliers to join NZFAP+, the purpose of which is to create better and more sustainable farming businesses. We are also working towards a regenerative agriculture certification in partnership with the Savory Institute, that will focus on demonstrating how our livestock suppliers incorporate our eight key principles for regenerative agriculture (see image) into their farming practice.

Eight Key Principles:



The current health of New Zealand farmland and the likely lesser (or in some cases positive) impact climate change will have on farmland productivity in certain areas of New Zealand relative to other parts of the world presents an opportunity to fill demand where supply has reduced. Shifting consumer perspectives that red meat must always have a negative environmental impact is also a key goal of the programme. An additional aim is to illustrate the difference between New Zealand's farming practices and the rest of the worlds in terms of both environmental outcomes and quality of the food produced. This should enable price premiums that can be passed on to our livestock suppliers to incentivise beef and sheep farming over conversion to dairy, horticulture, or forestry.

Biodiversity monitoring and enhancement will be a key component of any regenerative agriculture certifications or programmes reflecting this, Silver Fern Farms is supporting a nationwide project to enhance Farming with Native Biodiversity. This pilot programme will support 40 farms to develop Biodiversity Plans in 2022/23, we are also Investigating the role of Silver Fern Farms in using market led instruments to pay for Biodiversity credits and or the establishment of an enhancing nature fund.





OPPORTUNITY

Development of new revenue streams

Capitalising on the numerous different types of assets on farms, for example forests, healthy soil, and regenerative farming practices of our livestock suppliers, could enable different revenue streams.

Markets for ecosystem services and biodiversity offset schemes are developing, providing an opportunity for us to provide these services through existing relationships with livestock suppliers. Additionally, the cost of carbon is increasing and could need to be:

\$140 per tonne
by 2030

\$250 per tonne
by 2050

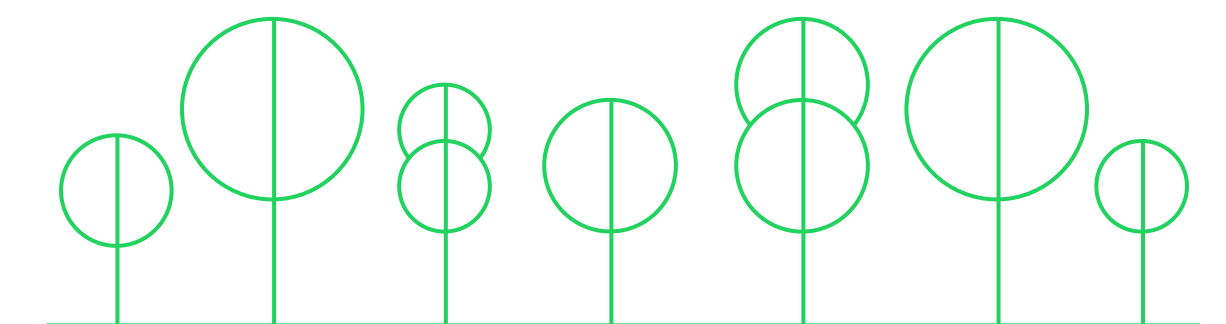
to enable the Government to meet international obligations. This will increase the demand for carbon offsets again providing us with an opportunity to partner with existing suppliers to provide these services.



Our carbon reduction pilot and regenerative agriculture programmes are our first steps towards exploring these opportunities which we expect will come to fruition in the next 5-10 years.

Demand for protein is set to double by 2050, and it is predicted that cultivated meat will make up to 60% of the protein market by 2040.

Given we already have connections to market, we may decide to consider what opportunities to participate in both the conventional and cultured meat markets.





OPPORTUNITY

Access to new forms of capital

As a way of supporting the transition to a low-emissions future and to enable positive long-term returns, New Zealand banks are increasingly seeking out certified green investments such as green bonds and sustainability linked loans (SLLs).

We do not have any core debt with our only debt being a working capital facility. In June 2022, we officially announced the signing of a SLL for this working capital facility with our banking syndicate that will enable us to embed our sustainability and climate ambition within our financing arrangements.

As well as giving us access to new forms of capital at discounted rates, our SLL will enhance our reputation as a climate conscious organisation.





OPPORTUNITY

Technology R&D to reduce GHG emissions and/or improve GHG traceability

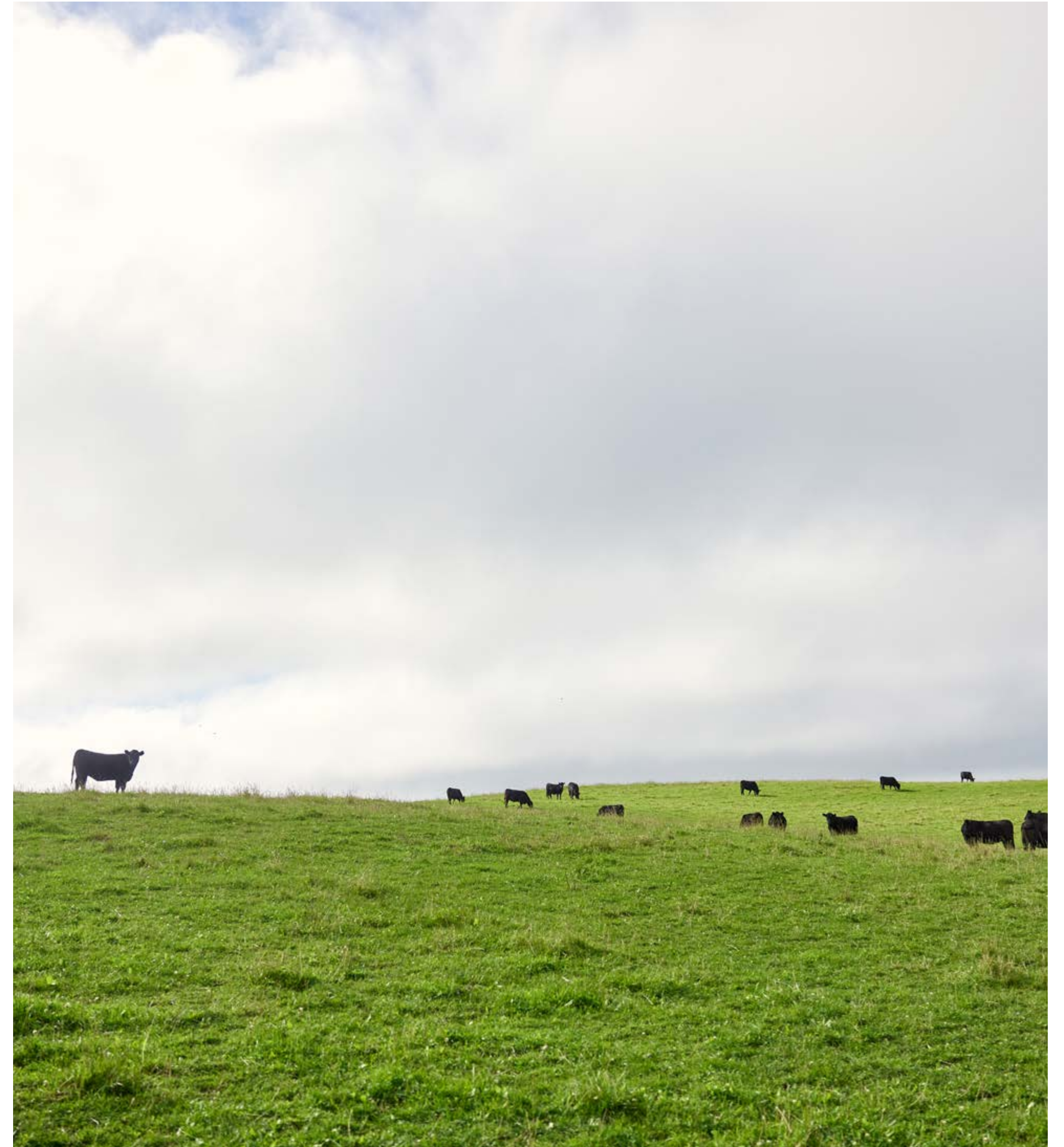
He Waka Eke Noa is likely to put a price on agricultural emissions and will increase farmer costs, incentivising land conversion which would likely impact on our supply of livestock.

Additionally, consumer demand for low emissions products is increasing while demand for high emissions products is decreasing. In the recently released Emissions Reduction Plan (ERP) discussion document, R&D in technology is identified as one of three key opportunities for the agricultural sector to reduce emissions addressing both the land conversion issue and reduced demand for red meat. There is an opportunity for us to invest or apply for government funding to carry out this R&D, in particular:

01 Emerging technologies such as methane and nitrification inhibitors and methane vaccines; and

02 Building on our supply chain traceability pilot to incorporate GHG, as agricultural carbon blockchain technology continues to develop;

These technologies will either help livestock suppliers to reduce emissions or provide consumers with GHG transparency. This will reduce the cost of carbon for both livestock suppliers and ourselves, enabling us to become the supplier/processor of choice and incentivise sheep and beef farming over land conversion.





05

Under TCFD, we are required to:

- Disclose the metrics used by the organisation to assess climate-related risks and opportunities in line with its strategy and risk management process.
- Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.
- Describe the targets used by the organisation to manage climate related risks and opportunities and performance against targets.

Metrics & Targets



Carbon Roadmap

Climate Innovation is a key pillar of our Sustainability Action Plan – we’ve made some great progress to date, but we are accelerating via range of bold initiatives to reduce emissions across our value chain, and position Silver Fern Farms as a global leader in nature positive food production.

2017–19

Become a founding member of New Zealand group of companies committed to fighting climate change – Climate Leaders Coalition – requires commitment to science aligned targets and public reporting of emissions.

Establish Scope 1 & 2 emissions baseline.

Undertake a carbon pilot with supplier farmers to understand how we could integrate low carbon or zero carbon supply into our product range, becomes the basis for our world leading Net Carbon Zero product range.

2020

Reduced processing emissions by 20% since 2018.

Coal-Out projects at Silver Fern Farm’s Belfast and Finegand sites receive co-investment via Govt Investment in Decarbonising Industry (GIDI) Fund.

2021

Commit to regenerative farming future, and adopt eight principles to underpin this on-farm including reducing carbon footprint and optimising biodiversity.

Achieved Toitū enviromark diamond certification, the highest New Zealand-based environmental certification.

Another major Coal-Out project at SFF Pareora site receives co-investment via GIDI.

Joined the International Science Based Targets initiative (SBTi).

Committed to a 1.5-degree science aligned target to reduce our combined Scope 1 and Scope 2 (Target: 42% by 2030 (from a 2020 base year).

2022

Know your Number workshops held to support 80% of our farmers record and manage on-farm emissions and sequestration.

40 farms participating in customised programme to support enhanced biodiversity.

Net Carbon Zero Beef launched in US.

SFF leads a consortium of NZ agribusiness to work alongside the Government on a game-changing GHG Reduction Centre of Excellence.

First climate related disclosure based upon international TCFD framework and baseline Climate Adaption Plan.

Adoption of Supplier Responsibility Standards.

2023–26

Emissions from coal have halved.

He Waka Eke Noa Agricultural Emissions Pricing comes into force.

SBTi scope 3 (On Farm emissions) target verified.

Launch Net Carbon Zero Lamb and Venison.

Carbon Budgets set as part of Operating Plan.

Climate/Nature positive premium for farmers developed.

2030

42% reduction in SFF operational emissions from 2020 baseline.

Zero Coal in operations.

10% reduction in On Farm emissions from 2023 baseline.

Full range of Climate & Nature positive products in multiple markets.

SFF Farmers farming systems. 100% aligned to Climate & Nature Positive/Regenerative practice.

Fully trading Silver Fern Farms Carbon Co-operative.



To understand and report transparently against our emissions reduction goals, we are committed to managing and reducing our carbon footprint.

We have been measuring scope one, two and limited scope three GHG emissions for the past three years, meeting the requirements of Toitū Carbonreduce certification.

Scope 1, 2, and limited scope 3 emissions

Our total measured emissions for FY20 were 99,334 tCO₂e, and were derived mainly from processing sites' fuel needs and processing sites' electricity needs.

Scope	tCO ₂ e
Scope 1	64,531
Scope 2	16,392
Scope 3 Mandatory	18,360
Scope 3 Additional	52
Scope 3 One time	0.00
Total gross emissions	99,334

An absolute reduction in Scope 1 and 2 emissions of:

23,789 tCO₂e

has been achieved against the 2018 base year.

However, we note this is likely to reflect only about 4% of our total emissions with 96% likely to come from on farm emissions.

Following on from our on-farm carbon pilot, we have developed a Net Carbon Zero beef product that was launched in the US during Q1 of 2022. AgResearch measured the carbon footprint of this product under ISO 14044:2006 and found that the total

GHG emissions = 33.14kg CO₂e
per kilogram of beef with on farm emissions accounting for 96% of total emissions.

Total by emissions source (tonnes CO₂e)



96%

of Silver Fern Farms GHG emissions for a kilogram of grass-fed Angus beef are on-farm, followed by 1.5% from processing.



Next Steps

01

We have joined the SBTi whereby the end of 2023 we will develop a full scope three target that extends to our livestock supply.

02

We have already adopted a science aligned target for our current scope one and two processing emissions of 42% reduction by 2030 on a 2020 base year which we expect will be accepted for validation by SBTi. These targets are science-based, aligning with what society needs to achieve globally to keep global warming to within 1.5°C.