

Submission

Climate Change Commission 2021 Draft Advice for Consultation

Introduction

Fonterra is a co-operative owned by 10,000 New Zealand farming families. With the support of the New Zealand Government, we have a modern and world-leading dairy industry where our products are desired in markets around the globe and where consumers are increasingly prepared to pay a premium for New Zealand products with strong sustainability credentials.

The ultimate strength of the NZ dairy sector is the ability of our farmers to innovate and adapt to change. Our farmers lead the world by producing the highest quality milk, quickly adopting technological advances, and increasingly enhancing and protecting the environment and land. We know that a healthy environment is the foundation for a strong economy and a sustainable dairy industry.

We are deeply cognisant that our business produces 20 per cent of New Zealand's greenhouse gas emissions. 90 per cent of those emissions come from our farmers' businesses; nine per cent from our manufacturing operations and one per cent from transporting our products from New Zealand to consumers around the world.

In our submission on the Climate Change Response (Zero Carbon) Amendment Bill, Fonterra supported the development of pathways and long-term robust plans that assist and guide the reduction of carbon emissions to meet New Zealand's climate change commitments.

New Zealand dairy farmers have a carbon footprint of about one third of the world average, as benchmarked by the International Dairy Federation 2015 Common Carbon Footprint Approach. Our Co-operative actively supports our farmers as they adapt and change to continue reducing these carbon emissions.

For farmers to meet their 2030 and 2050 methane reduction responsibilities, significant investment is required from both the Government and industry in research and development in order to create practical steps that farmers can take. This investment, combined with regular reviews based on robust scientific and economic analysis, will provide farmers with greater control and clarity about what is expected from them and the practical steps they can take to continue playing their part in meeting New Zealand's global climate commitments.

The possible financial impact of New Zealand being able to reduce methane emissions from livestock is significant yet challenging to quantify. We are seeing increased and changing expectations regarding the environmental impact of farming from both the communities in which we operate, and from local and global consumers.

In order to get our products to consumers, we are significant users of both the road and rail networks. Our Co-operative is heavily reliant on an efficient, reliable and cost-effective transport network that supports the competitiveness and sustainability of New Zealand's products in global markets.

Our fleet of milk tankers travel around 95 million kilometres every year collecting over 17 billion litres of milk from farms and delivering it to manufacturing sites. We invest and seek practical ways to reduce the carbon footprint of our fleet through driver training focused on fuel efficiency, optimising the routes the tankers travel, and moving our fleet to lower emissions-producing vehicles.

Rail also plays an important part in our transport strategy and is a vital asset in New Zealand's decarbonisation journey. Every year we move 2.3 million tonnes of product via rail to ports so it can be shipped to customers and consumers around the world. We use the rail network in Northland, Waikato, Auckland, Bay of Plenty, Taranaki, Canterbury, Otago and Southland regions. Transporting finished products via rail rather than road is not only better for the environment but it is also safer for other road users.

We are New Zealand's largest exporter with 27 manufacturing sites spread across New Zealand. Each factory is unique in terms of the volume of milk it processes, the products it makes, the energy sources available and the age of its assets. Nine of our sites rely on coal as a primary source of energy, including one which co-fires with wood biomass. Seven of these sites are in the South Island where there is no reticulated natural gas available.

For many years we have been working to lower our emissions and have made progress. Last year we achieved our target of a 20 per cent reduction in our energy intensity which is the energy used per tonne of product made, using 2003 as the baseline year. We have achieved this by moving some of our North Island sites off coal; transitioning to wood biomass and wood pellets at our Brightwater and Te Awamutu sites; and increasing the efficiency of our assets across all of our manufacturing sites. The energy we saved to get to this point is enough to power all the households in New Zealand for 1.5 years (approximately 63PJ). In July 2019 we committed to not installing any new coal boilers or increasing our capacity to burn coal in our manufacturing operations. We have also strongly advocated for a legislative ban on the installation of all new coal boilers.

While we have made significant progress, substantial challenges remain. Our commitments to reduce carbon emissions from our manufacturing operations by 30% by 2030 based on 2018 levels and net zero by 2050 align to the Commission's recommended pathway for decarbonisation of industrial process heat.

We accept the Commission's proposed pathway for decarbonisation of industrial process heat, including an end to coal use for industrial heat by 2037; and the subsequent retirement of natural gas for process heat from 2037 onwards.

The pathway to ending coal use by 2037 is ambitious and will be challenging to meet. While we are working to transition our manufacturing operations onto renewable energy sources and off coal by 2037, the current and forecast gas scarcity issues in the North Island pose a significant material risk to completing this transition within this timeframe.

Over the past 18 months there have been significant disruptions in the gas market. With a disruption with Kupe gas field; the decline in the Pohokura gas field; and no new significant gas fields planned, there is a significant risk of gas supply interruptions at our gas fuelled sites. If we do not have certainty of gas supply, we may need to start transitioning our 76 gas boilers and air heaters to renewable alternatives sooner than the Commission's pathway of 2037 onwards, which would almost certainly impact the speed at which we transition off coal.

From a business continuity risk perspective we must be able to process all of our farmers milk, so are unable to have too many manufacturing sites undergoing significant infrastructure changes at the same time. Due to the nature of the New Zealand dairy curve, there is only a very short period every year when we can undertake significant changes to our manufacturing sites. Maintenance at our sites is undertaken when the cows have dried off and must be completed before calving begins and the amount of milk to be collected significantly increases. Over a six to eight-week period, we go from collecting around four million litres of milk a day to around 82 million litres a day. All of our sites must be working close to full capacity to cope with this volume.

We carefully plan this maintenance to account for possible project delays and the impact natural disasters such as severe flooding can have on our operations. We strongly recommend that the Commission focuses on the interdependency of coal and gas and the impact that the scarcity of gas could have on the dependence on coal for security of supply. We strongly support the goal of reducing New Zealand's emissions and believe a New Zealand Inc. approach is key to addressing our collective decarbonisation challenge. While the challenge ahead may not be simple, we look forward to continuing to work with Government and others to ensure New Zealand meets its climate change commitments.

The global 1.5°C goal and Nationally Determined Contribution (NDC)

Fonterra takes a long-term view of our industry and country. We support the Commission's recommendation that the NDC be strengthened to ensure New Zealand's contribution is compatible to global efforts in limiting global average temperature increase to 1.5 degrees Celsius above pre-industrial levels.

Increasingly consumers want to know where their food comes from, how it is made and what impact it has on the environment, animals and communities. To meet customer needs we are continuously looking at how we can provide more sustainable solutions by improving our performance, transparency, and innovating our products.

Eventual reductions in biogenic methane

We support the split gas approach recognising the differences between the shorter-lived gas of biogenic methane and the longer-lived gases of carbon dioxide and nitrous oxide.

To ensure that farmers and the wider sector are given as much policy certainty as possible, we are seeking that the Commission provide advice to the Government prior to 2024 on the appropriateness of the 2050 target for methane reduction.

We note that the Commission's recommended pathway up to the end of Budget 3 aligns more reasonably with a 2050 target ultimately set at the 24% gross reduction end of the range. The combination of reductions to the end of Budget 3 along the proposed pathway and then a 2050 target at the 47% end of the range would require very steep reductions between 2035 and 2050. Clarity on the 2050 target and its practical alignment with the Commission's proposed pathway will be more useful for farmers than a 2100 target.

Transport

- We support the accelerated uptake of light electric vehicles where there are suitable replacement options and accompanying infrastructure available with longer-range and towing capability (vans and utes).
- We support the development of a charging infrastructure plan for the rapid uptake of EVs to ensure greater coverage, multiple points of access and rapid charging.
- We support the increased use of low carbon fuels across the supply chain; the development of an investment strategy; and clear targets to increase the share of rail and coastal shipping.

Actions undertaken to reduce our transport emissions

- Implementing a new policy that all Fonterra Co-op light vehicles that can be electric should be electric on replacement. This means that around a third of our light vehicle fleet will be electric in the next 3 years.
- Developing plans to install EV charging infrastructure in regional hubs to service our staff and the local communities in which we operate.
- Encouraging flexible working for our staff to support the balance between an employee's hours spent at work and at home, while helping to reduce their carbon footprint.
- Continuing to invest and develop ways to reduce the carbon footprint of our heavy fleet through driver training; a focus on fuel efficiency; optimising tanker routing; and moving to higher productivity vehicles (HPMV) and moving to Euro 6 emission standard vehicles.
- Working collaboratively with our sector partners like KiwiRail to help create efficiencies in the supply chain and facilitate infrastructure investment that benefits the productivity of New Zealand.

Road transport

Accelerate light electric vehicle (EV) uptake

Fonterra has a light vehicle fleet made up of:

- 820 Fonterra owned vehicles; and
- 150 leased vehicles

Of the Fonterra owned vehicles, 620 are part of the Co-op's fleet. 256 vehicles are personally assigned vehicles for staff who need to travel as part of their core responsibilities; 230 are pool cars and 140 are tools of trade vehicles (mostly utes) for staff who have operational duties.

The scale of our light vehicle fleet means transitioning a proportion to EVs can help meet the proposed emissions budgets, increase electric vehicle demand within the domestic market and support EV infrastructure.

To help achieve the accelerated uptake of EVs, we have recently implemented a new policy that all suitable Fonterra light vehicles that can be electric, should be electric on replacement. This means that around a third of our light vehicle fleet will be electric in the next 3 years.

For our Farm Source business, a fleet replacement programme is more difficult given there are currently no suitable EVs to replace a large majority of the fleet which are required to travel long distances over difficult rural terrain. We are currently in the process of evaluating the viability of integrating EVs into the staff fleet as an initial step and hope to have our initial findings by the end of March 2021.

The Fonterra Brands New Zealand (FBNZ) part of our business which services supermarkets and cafes has a light vehicle fleet that is currently leased. We are in the process of purchasing 86 vehicles out of the fleet of 150 by the end of March 2021. Moving forward we plan to continually purchase the remainder of the 64 leased vehicles by the end of 2022. FBNZ's light vehicle strategy will be reviewed in FY21/22 to understand the decarbonisation opportunities of the fleet.

Regional charging hubs

We have manufacturing sites spread across New Zealand meaning our staff travel both to work and between sites. We plan to install EV charging infrastructure in regional hubs to service our fleet, staff and visitors, focused on high-use and close distance sites first.

We have been working in partnership with ECCA to create four EV transport hubs in the South Island. This will see the installation of 26 EV slow chargers at four key manufacturing sites to assist more than 2,000 staff commuters, visitors and company vehicles to switch to EVs. Two will be funded by Fonterra and two will be co-funded with EECA.

It is estimated that this will reduce emissions associated with our site fleet cars by 52 tonnes of CO2-e per annum by switching from ICE/hybrids to EV's. The proposed EV infrastructure and implementation is set out below.

Regional hub	Number of sites	Number of chargers	Estimated timeframe for hub implementation
London street, Hamilton / Fanshawe street, Auckland	2	10	Mid 2021
Te Wai Pounamu – Our Clandeboye, Darfield, Edendale, Stirling manufacturing sites	4	26	Mid 2021

As we collectively work to address the barriers towards light electric vehicle uptake, we would like to work with the Government and industry partners on a rural EV demonstration project over the first budget period. This demonstration would help to identify the additional support needed to facilitate EV uptake in rural communities, where there is little uptake because of the lack of appropriate vehicles.

Electrify medium and heavy trucks

Our tanker fleet

- 481 tankers in our fleet, travelling approximately 95 million kilometres per annum.
- During peak milk season, our 481-strong fleet is on the road day and night, picking up a vat of milk every nine seconds around the country.
- Each tanker can hold 28,800 litres of milk - 11,300 litres in the truck and 17,500 litres in the trailer.
- We have a fleet of 32 additional contingency tankers to ensure we can always collect our farmers' milk.
- We also operate 4 higher productivity (HPMV) bulk units on dedicated routes.
- To support the movement of bulk liquid movements between our manufacturing sites, we manage around 150 contractor road movements across the country and a twice daily train transporting milk between Longburn and Whareroa.

Fonterra continues to invest and develop ways to reduce the carbon footprint of our tanker fleet. We are doing this through driver training, a focus on fuel efficiency, optimising tanker routing, moving to higher productivity vehicles (HPMV) and moving to Euro 6 emission standard vehicles.

We currently have 182 HPMV tankers in our current fleet, with 35 meeting Euro 6 emissions standards.

It is important to note the use of higher productivity vehicles is limited due to bridge loading limits on parts of the rural roading network, and on-farm tanker tracks with limited dimensions.

We are also completing the installation of monitoring systems in our farmers' milk vats this year. The aim of this technology is to support our farmers' production of high-quality milk and make the Co-operative's milk collection more efficient. These monitoring systems will help improve collection efficiency as it will provide more precise information about the volume available for collection. Due to this smart use of data, our tanker fleet was reduced by three vehicles this year, and our fleet will reduce by a further three to four tankers next dairy season.

We are always investigating alternatives to diesel power options to reduce carbon emissions from our milk collection fleet and are currently looking at options for hydrogen injection as a potential option. We would be happy to share our findings with the Commission as this work develops.

Reducing travel demand

Encouraging flexible working is a key part of our Diversity and Inclusion strategy and aims to support the balance between an employee's hours spent at work and at home. While there are some roles where flexibility is more difficult to manage, such as employees who work in our manufacturing sites, it is encouraged wherever possible.

By supporting our people to work from different locations, or at different times, we can attract and retain a wider pool of talent and help our people blend their responsibilities – both inside and outside work. We also acknowledge that flexible working is an effective way to help reduce an employee's carbon footprint through a reduction in commuting to the office.

Non-road transport

Rail

Rail plays a very important part in our transport strategy, as we transport 2.3 million tonnes of product via rail every year across Northland, Waikato, Auckland, Bay of Plenty, Taranaki, Canterbury, Otago and Southland.

We have invested in rail infrastructure and have built tracks into many of our manufacturing sites and distribution centres which allow our forklift drivers to load containers directly onto trains. At our busiest time of year, we fill a shipping container with our product every three minutes.

In our experience, rail is more reliable than other modes of transport as it is less susceptible to delays than the alternatives. Getting our products to our customers as quickly as possible is vital, and for long-haul transport the average transit time of rail can be comparable to that of road transport.

Moving product via rail rather than road brings significant environmental benefits. Increasingly shifting freight off roads and onto rail, where possible, is an important aspect of our strategy to reduce our environmental footprint.

Greater coordination and alignment between significant freight movers, such as primary producers and KiwiRail, is needed to implement the Government's agenda. This includes the desire that short term pricing decisions by KiwiRail do not lead to freight being moved off railway lines and back onto roads. Such a move would be contrary to meeting New Zealand's decarbonisation goals and would significantly impact road users.

Biofuel blending

In 2014 we partnered with Z Energy to help introduce biodiesel to New Zealand. As a foundation customer, we agreed to pay a premium for the biodiesel, which covered the cost of production. We ran 156 tankers in the Waikato and Bay of Plenty regions on biodiesel and this resulted in 4 per cent fewer emissions each year.

Since the initiative was discontinued by Z Energy in early 2020, we have had to move our 156 tankers back to standard diesel as there is currently no other source of biodiesel available at the volumes required for our fleet. The initiative was a positive interim step to reduce our carbon emissions and it proved that almost any diesel engine can run a level of biofuel without adaption. Fonterra believes this and similar initiatives should be centrally supported to help New Zealand achieve our emission reductions targets.

Due to the long distances covered by our tankers and variable road conditions, there are currently no technically feasible options for hydrogen tankers that would suit New Zealand conditions. Additionally, our manufacturing sites are largely based in rural locations, so building and maintaining infrastructure for hydrogen re-fuelling would be costly. These factors will influence the technical feasibility and economics of hydrogen compared to other low emission options, which makes it difficult to provide a useful assessment of the potential of hydrogen as a fuel for our tanker fleet.

Coastal shipping

The efficiency, reliability and cost-effectiveness of the supply chain is critical to New Zealand and its emission reduction budgets. We see an opportunity to work more collaboratively with others to help create efficiencies in the global supply chain and facilitate infrastructure investment that increase productivity.

We strongly support the Commission's recommendation that emissions from freight can be reduced by switching some freight movements from road to rail, and a greater use of coastal shipping. This includes the creation of efficient freight corridors into and out of key logistics centres, by forming transport hubs that better connect road, rail and coastal shipping.

The economic and sustainability benefits that coastal shipping provides businesses can be seen in the recent launch of the new coastal ocean freight service, Maersk Sirius Star. New Zealand's largest supply chain collaboration, Kotahi, has worked collaboratively with Maersk to launch this new service which will boost container availability and improve transit times for New Zealand exporters.

The new service brings additional benefits and enables an improved transit time to key markets in Europe, South East Asia, Middle East and West Central Asia with transit time improvements for New Zealand exporters of up to 10 days. It also provides another option to distribute containers throughout New Zealand, particularly from North to South Island, which is helpful given the level of supply chain disruptions New Zealand is currently facing.

Heat, Industry and Power

- We accept the Commission's proposed pathway for decarbonisation of industrial process heat, including an end to coal use for industrial heat by 2037; and the subsequent retirement of natural gas for process heat from 2037 onwards noting the current and forecast gas scarcity issues.
- We strongly support an immediate ban on the installation of all new coal boilers in New Zealand, regardless of the heat they produce.
- We support the development of a plan between Government and industry for the bioeconomy alongside the new national energy strategy to scale up the provision of low emissions energy sources.
- We support greater collaboration between Government and industry in implementing emissions reductions opportunities including energy efficiency, process optimisation and fuel switching.

Actions undertaken to reduce our manufacturing emissions

- In 2017 we set our climate change commitments to reduce carbon emissions from our manufacturing sites by 30 percent by 2030, and to be net zero by 2050.
- In June 2019 we committed to not installing any new coal boilers or increasing our capacity to burn coal.
- In November 2018 we co-fired the boiler at our Brightwater site with biomass, reducing carbon emissions by around 2,000 tonnes a year.
- In August 2020 we switched from burning coal to wood pellets at our Te Awamutu site, reducing our annual coal use by almost 10% and reducing carbon emissions by around 84,000 tonnes a year.
- In July 2020 we met our target of 20% reduction in energy intensity from 2003 to 2020.

Our journey to decarbonisation

We are committed to achieving a 30% reduction in our absolute emissions from our manufacturing sites by 2030 based on 2018 levels, and to being net zero by 2050.

We have achieved our first target of a 20 per cent reduction in energy intensity (GJ used per tonne of product manufactured) by 2020, using 2003 as the baseline year, by increasing the efficiency of our assets across all our manufacturing sites. The energy we saved to get to this point is enough to power all the households in New Zealand for 1.5 years (approximately 63PJ), and cumulatively reduced emissions by ~3.3 million tonnes – this is the same as taking ~1,286,000 cars off NZ roads.

We are approximately 20 per cent of the way to achieving our 2030 emission reduction target, with the energy efficiency measures and the two wood biomass projects at our Brightwater and Te Awamutu sites. We have a plan to undertake various activities over the next decade to meet this target including further energy efficiency activities, such as fuel switching from coal to low emission energy sources.

In July 2019 we committed to not installing any new coal boilers or increasing our capacity to burn coal. As we advocated for our submission on MBIE's Accelerating Renewable Energy and Energy Efficiency discussion document, we strongly support an immediate ban on the installation on all new coal boilers in New Zealand, regardless of the heat they produce. As a coal boiler installed today could still be in use in 50-60 years if it is well maintained, we need to ensure that assets we build today meet New Zealand's long-term goals.

Our ability to decarbonise our manufacturing sites is based on competing funding priorities including health and safety upgrades to protect our people, environmental initiatives such as wastewater treatment upgrades, plant maintenance and installing new, innovative product lines for our customers.

We support a managed transition period to bring alternative heat-sources online and into commercial reality. The timing of this transition must align with the availability of alternative energy sources; the ability to physically and financially implement these changes; and ensure that the benefits that co-firing coal boilers and heat recovery systems offer are accounted for as mechanisms for reducing emissions.

A key part of our emissions reduction strategy has been to reduce the amount of energy we use via energy efficiency improvements, and to seek alternatives to fossil fuels. The combination of increasing the energy efficiency of our manufacturing sites and the use of wood biomass and wood pellets at our Brightwater and

Te Awamutu sites, have reduced our absolute manufacturing emissions by approximately 109,000 tonnes per annum since FY18.

We support the Commission's recommendations that where available, biomass from forestry and wood processing residues are a relatively lower-cost fuel switching opportunity (not including capital costs) when compared to other renewable fuel sources such as electricity.

Our strategic assessment based on current information available is that the preferred lowest carbon abatement cost decarbonisation pathway for our coal fired sites is for the implementation of energy efficiency initiatives combined with fuel switching to wood biomass.

However, the solution for a specific site is dependent upon wood biomass volume availability, alongside appropriate phasing of infrastructure changes and the capital cost across multiple sites to manage the risk of change impacting our ability to process milk at sites. Due to the milk supply curve, our manufacturing sites often only undertake significant infrastructure changes during our short winter shut down period. This provides a constrained window for plant upgrades and means that there are limits placed on the practicable speed of capital works.

There are also a range of interdependencies within our sites that will influence the timing of activities, such as the spend profile of repairs and maintenance of boilers, boiler condition and upstream fuel supply opportunities or risks. However, our recent fuel switching projects at our Brightwater and Te Awamutu sites have shown that we can successfully and efficiently transition from coal to wood biomass at scale.

We are looking at what we need to do at our sites to enable them to switch to use wood biomass, either by converting our coal boilers or installing new boilers.

Key considerations when changing fuel source

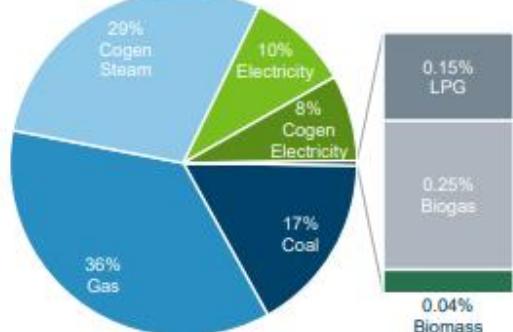
When considering transitioning a manufacturing operation we consider six key issues:

1. Will it impact our ability to process all of our farmer's milk;
2. How much capital investment is required; and what is the impact of the ongoing operational costs of using the alternative energy source;
3. Do equipment suppliers have manufacturing capacity to produce the necessary boiler, and the associated equipment and infrastructure;
4. Is there long-term security of supply of the alternative energy source(s);
5. Will it meet our sustainability goals; and
6. Will we remain economically viable in a globally competitive market?

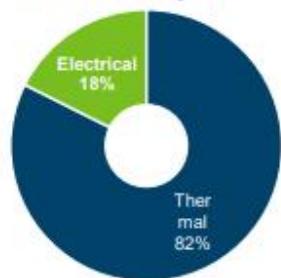
Large scale manufacturing decarbonisation projects also require a significant amount of change to existing equipment and infrastructure at the manufacturing site and developments in the upstream supply of the renewable energy source.

Our energy use

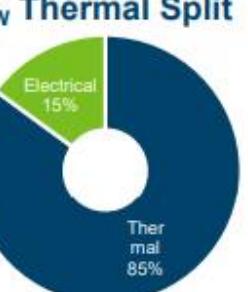
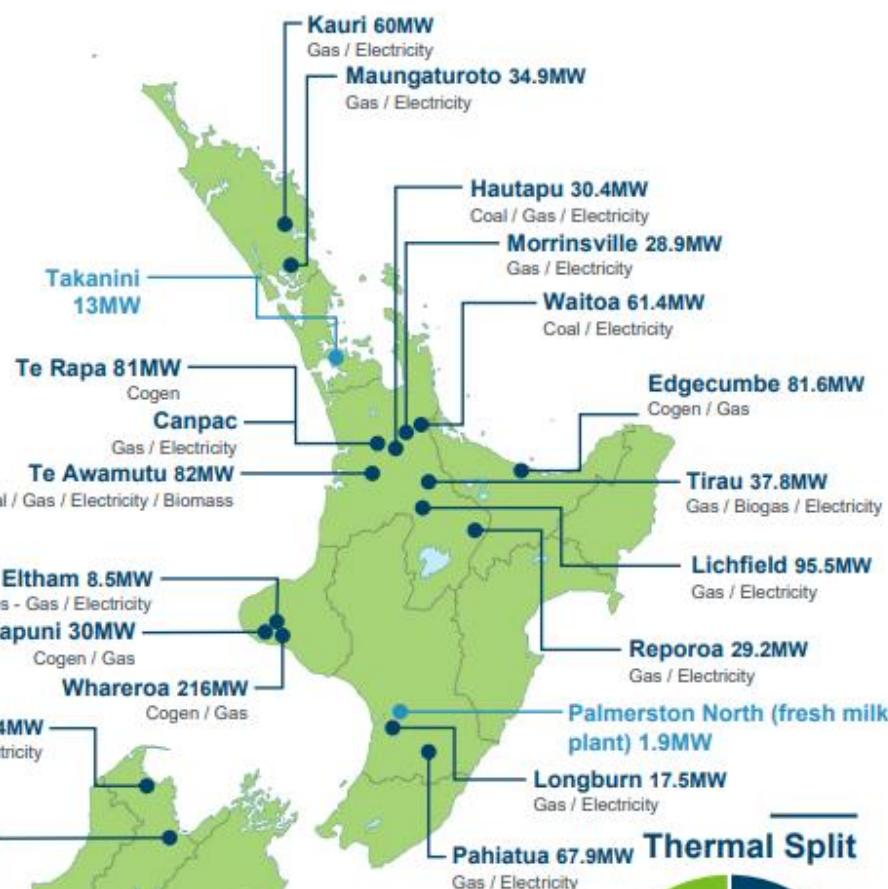
North Island



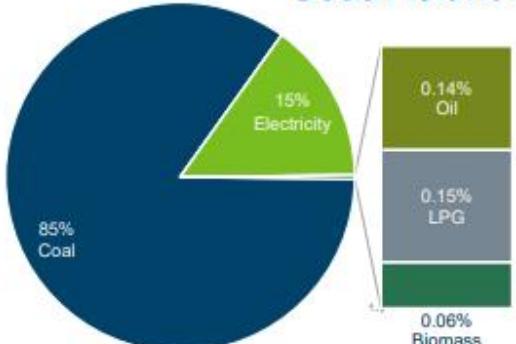
Thermal Split



█ NZ Manufacturing
█ Fonterra Brands NZ



South Island



Maximising the use of electricity

We have undertaken several studies across multiple manufacturing sites and have learnt a significant amount about what is required to transition a site to use a greater amount of electricity, instead of fossil fuels. In 2017 we undertook an electrification feasibility study in partnership with the Ministry for the Environment at our Edendale site in Southland. We then took these findings and applied them to our Stirling site in South Otago as the potential demonstration site for electrification. We have also applied this approach to several other sites.

During our studies into process heat electrification, we have assessed the integration of heat pumps in applications under 100 degrees; converting our thermal vapour recompression (TVR) evaporators to mechanical vapour recompression (MVR) evaporators; and fuel switching to use electrode boilers.

Following these studies, we do not have any plans to switch any of our boilers to electricity. This is because although the emissions associated with electrification are low, the operational and capital cost when compared to other fuel sources is very high.

Capital considerations aside, our ability to electrify these sites is also severely constrained by the Transpower electrical line supply upgrades that would be required to increase the capacity for electricity supply into the sites to enable electrification.

Key findings from our electrification feasibility studies:

- When we looked at the six key considerations that must be met when switching fuel source at a site, installing an electrode boiler at our Stirling manufacturing site did not meet all of these considerations, whereas a wood biomass boiler did.
- If we were to install an electrode boiler at our sites, it would take several years for additional electrical lines supply capacity to be available to most of our sites to meet the proposed increase in electricity demand at the site.
- An electrode boiler at any manufacturing site also requires a significant increase in operating cost because of the higher cost for electricity. This energy cost increase was estimated to be around a 225 per cent cost increase compared to coal.
- We have identified similar internal and external capital cost challenges, as well as the operational cost increase, when we have assessed fuel switching to electricity at a range of other sites.
- It is easier and more cost effective to incorporate electrification elements into new builds, than retrofitting existing systems if hot water system infrastructure is not present.

There will undoubtedly be opportunities in some locations and under some scenarios for electrification of some elements of our operations, however, the conversion of an entire manufacturing site to electricity for process heat generation is unlikely to be feasible. Greater electricity use within parts of our manufacturing site processes (see last bullet above) is more likely to be practicable.

Transmission and distribution grid upgrades

In New Zealand, Fonterra uses approximately 1,100 GWh per year of electricity, which includes the electricity from co-generation facilities.

As our sites are located across the country, we have relationships with 16 different electricity distribution businesses. Energy is a significant cost input into the manufacturing process and maintaining a cost-effective energy supply is essential for our Co-operative to compete in a globally competitive market.

The Transmission Pricing Methodology (TPM) is a material proportion of electricity costs and without regulatory certainty of TPM, greater use of electricity is disadvantaged relative to other energy sources. Certainty of future transmission and distribution costs are an important element for potential decarbonisation via electricity.

We are concerned that the new TPM allocates greater costs to additional electrical load. For example, if Fonterra installed a large electrode boiler the TPM costs would likely be materially greater under the new TPM relative to the status quo. As the new TPM costs are uncertain it is extremely difficult to calculate in advance what the new TPM costs will be. Fonterra believes that the new TPM penalizes renewable energy by allocating greater costs to decarbonisation projects than the status quo.

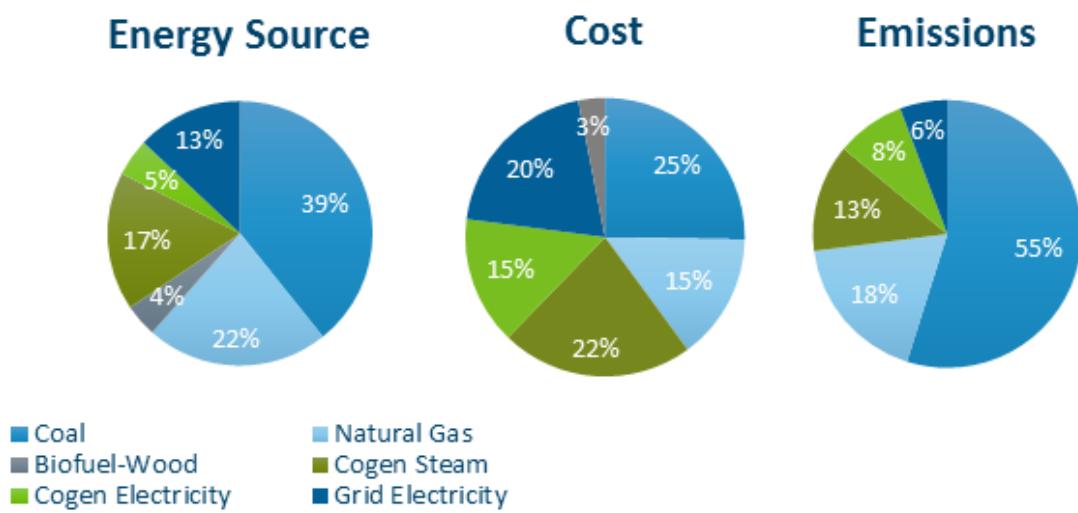
Expand renewable generation base and achieve 95% renewable generation

Fonterra is supportive of expanding the renewable electricity generation base which is why we have partnered with other Major Electricity User Group members including New Zealand Steel, Oji Fibre Solutions, Pan Pac Forest Products and Ballance Agri-nutrients to go to market with a project to stimulate the development of new renewable electricity generation in New Zealand.

The project aims to accelerate the development of renewable electricity projects in New Zealand through providing a long term, stable and therefore bankable commercial platform for projects to be launched off, backed by companies which have the balance sheets to do so.

Industrial process heat

Our 27 New Zealand manufacturing sites use ~24PJ annually, which is 3 per cent of New Zealand's total primary energy supply, to process 17-18 billion litres of milk (note this data is from FY20). This is predominantly thermal energy which is generated from burning coal, natural gas, biogas, or wood biomass at our sites.



On average, our sites currently use 17 per cent electrical energy and 83 per cent thermal energy. Nine of our 27 sites use coal – two in the North Island, and seven in the South Island.

Across our manufacturing sites, there is a lot of infrastructure investment that still has many decades of working asset life left. We have 21 coal boilers and air heaters, and 76 gas boilers and air heaters installed throughout NZ, with an average age of 28 years, ranging in size from 1MW to 56MW, with a total installed capacity of ~1,300MW.

The Commission's proposed pathway

Our commitments to reduce carbon emissions from our manufacturing sites by 30% by 2030 and net zero by 2050 are aligned to the Commission's recommended pathway for decarbonisation of industrial process heat.

The Commission's focus on replacing coal with biomass and electricity in Budget periods 1 and 2, including an end to coal use for industrial process heat by 2037, followed by the subsequent replacement of gas with biomass and electricity in Budget period 3 is consistent with the pathway required for us to meet our existing commitments.

We believe an appropriate fuel source for decarbonising our industrial process heat in line with the Commission's pathway is wood biomass, in combination with continuing to improve our energy efficiency. Fonterra has undertaken extensive analysis on the potential upstream wood biomass supply, including a commercial request for information on potential pricing, volume, and specification availability. We would be happy to share the studies we have undertaken with the Commission if this would be helpful.

We recognise there will be increased demand for biomass as many organisations transition to this product for their decarbonisation efforts. There is room for further upstream developments, such as expansion of plantation forestry and domestic sawmill operations, to ensure that there is sufficient long-term supply of forest residuals for low cost process heat transitions and domestic log supply for domestic sawmillers, as well as further development of the wood biomass industry in the South Island to enable coal boiler conversions.

In order to meet the Budget 1 and 2 pathways, we agree with the Commission's assertion that 1-2 large dairy boilers per year will require transitioning. This is a substantial undertaking. Each project to transition a coal boiler via either converting it (if technically possible) or replacing it with a new wood biomass boiler is complex in its own right and will have site specific requirements.

In general, each boiler transition relies on:

- Resources, both capital and people, both internal and external to each organisation
- Suppliers' manufacturing capacity to produce the necessary boiler, and the associated equipment and infrastructure
- Our ability to ensure that we can process all our farmers' milk without any material interruption
- Consenting and regulatory approvals
- Fuel procurement

As complex as each transition is, the Commission's pathway envisages multiple complex projects sequenced in a timeframe with little scope for slippage or unforeseen delays.

Our ability to decarbonise our manufacturing sites is based on competing funding priorities including health and safety upgrades to protect our people, environmental initiatives such as wastewater treatment upgrades, plant maintenance and installing new, innovative product lines for our customers.

As we have outlined above, we recognise that future customer demand is contingent not only on continuing to manufacture high quality dairy products, but also on our ability to ensure our impact on the climate is appropriately mitigated.

In addition to the significant capital investment required to convert or replace our boilers, renewable alternatives such as biomass and electricity will have different ongoing operational costs when compared to coal. The transition to renewable fuel sources will require substantial on-going investment which must balance with our need to produce products which are sold in a globally competitive market.

It is a difficult task to robustly estimate future operating costs for a transition with so many potential variables. For example, over the last 12 months the electricity spot market price has doubled, making direct use of electricity for thermal decarbonisation uneconomical. As other energy users decrease their demand for regulated infrastructure assets such as electricity transmission lines or gas transmission pipelines to transition away from coal, the costs of using these assets will be spread across remaining users, resulting in higher operational costs. When the Tiwai smelter load exits the market, Fonterra's electricity transmission charges are forecast to increase by \$12 million per year under the proposed new Transmission Pricing Methodology.

The uncertainty in NZ ETS pricing and its impact on cashflow may increase operational costs faster than we can counter through capital spend on decarbonising.

As an example of the external resource constraint to deliver a large boiler transition, there are currently only two New Zealand based boiler vendors that have the capability to design, build and commission biomass or electrode boilers in the 10MW to 50MW range. We understand that these boiler vendors only currently have a staffing capacity to be able to deliver one new boiler per year.

It typically takes 40 people a year to build a new boiler, ranging from civil, electrical, and mechanical engineers, electricians, welders, scaffolders to general labourers. We acknowledge that the significant increase in demand for boiler transitions will aid vendors to increase their capacity, but there is a limit to the speed at which the skilled engineers, welders, fabricators, and electricians required can be trained.

Unintended consequences of moving faster than the 2037 pathway

If there was a desire to move materially faster than the pathway proposed by the Commission, there are significant risks and real costs. We believe that the overall costs of decarbonising milk processing faster ahead of 2037 rise substantially for every year that the date for coal use to cease is bought forward. This is due to the significant contingencies and interdependencies inherent in the multiple conversion projects envisaged; the scarcity of capital; the scarcity of skills required; and the material risk to milk processing.

Our preliminary analysis based upon high level capital cost estimates provided for some projects and extrapolated out suggests that it costs \$1.4 million per MW for new wood biomass boilers. This suggests that an end to coal use for industrial process heat by 2030 would approximately double the capital cost of the 2037 pathway without accounting for the external resources required to deliver it. These externalities – noting additional constraints due to COVID-19 - include the suppliers manufacturing capacity to produce the necessary boilers, and the associated equipment and infrastructure; consenting and regulatory approvals; fuel procurement; and personnel both internal and external to each organisation to deliver the project.

As challenging as ending coal use by 2037 will be, a significant material risk to be able to complete this transition is the availability of gas in the North Island. Over the past 18 months there have been significant disruptions in the gas market. With the disruption with Kupe gas field; the decline in the Pohokura gas field; and no new significant gas fields planned, there is a significant risk of gas supply interruptions impacting our gas fuelled North Island sites. If we do not have certainty of gas supply, we may need to start transitioning our 76 gas boilers and air heaters to renewable alternatives sooner than the Commission's pathway of 2037 onwards.

We are unable to have too many boilers under transition at the same time. As we mentioned above, due to the seasonality of the New Zealand milk curve there is often only a limited window of about three months each year when we can undertake significant infrastructure projects at our manufacturing sites. If there are too many boilers being converted or new boilers being installed during one maintenance season, then the chance of a delay or an issue occurring which delays the boiler going back into service puts our ability to process our farmers' milk at serious risk.

Immediately after the maintenance period, we start the new milk season and milk volumes grow exponentially from processing 4 million litres a day in late July to processing 82 million litres a day eight weeks later. We need all our boilers to be operational during this time. If there was a significant failure, then we would potentially need to ask our farmers to dispose of it on their land. In summary, compromised gas supply could inhibit the complete transition off coal in the next 16 years.

Using biogas to reduce our emissions

We are currently undertaking a study with Beca, Firstgas Group, Lion, and EECA to assess the potential of raw biogas being treated so it becomes a possible substitute for natural gas. The final report is due at the end of March 2021 and we would be happy to share our findings with the Commission.

The Government may wish to look at how it could assist Local Government to develop local biogas systems, by utilising existing natural gas assets both in residential and industrial areas to create regional biogas plants. This could be achieved by using a bio-digester to capture bio-methane from waste food. This energy could then be recycled in the local energy system or reinjected into the national grid.

These plants would help to generate employment in regional New Zealand; help to reduce the volume of material that is going to landfill and will produce a valuable soil fertiliser; and would also allow local councils to meet the increasingly stringent wastewater processing requirements.

When we opened our cream cheese plant at Darfield in Canterbury in 2018, the increased production capacity resulted in increased wastewater volumes. In order to address that increase, we have built and are currently commissioning a biological digester at the site. A biological digester is a tank system containing special microbes able to metabolise specific nutrients like fats and proteins in the wastewater. The tanks maintain exactly the right conditions such as pH, temperature and oxygen levels for the maximum nutrient removal, meaning that the wastewater coming out of the biological digester is of very high quality.

The digester is also capable of producing gas which can be used to produce hot water reducing the need for either coal or electricity.

This solution provides the best environmental outcome with a high-quality wastewater and biogas as a by-product. This approach is being considered as a future upgrade option at our manufacturing sites around the country. We are currently flaring the gas for this season until we gain better knowledge around the volume of biogas produced.

We would be happy to share our findings with the Commission.

Land – Agriculture

- The scale of the on-farm behaviour and practice change required to achieve the biogenic methane pathway identified by the Commission is both challenging and ambitious, even in the context that the pathway has been modelled as being achievable utilising existing practices. We are concerned that some of the productivity assumptions underpinning the modelling, that show a maintenance of current milk production, are very ambitious and will be difficult to meet. We strongly support the development of a long-term plan for research and development by the Government and industry as the key to creating new innovations to help farmers meet the emissions budgets.
- We support the development of effective mechanisms by Government and industry to ensure the plans and, advisory and guidance topics developed by He Waka Eke Noa will endure beyond 2025 and can support achievement of the emissions budgets.
- We strongly support the prioritisation of the Rural Broadband Initiative to achieve its 2023 targets as increased connectivity would enable farmers to do business more efficiently while enabling the utilisation of smart technology.
- We support the review of current regulatory frameworks that enable the development of new emission reducing technologies, products and practices. Encouraging the development of robust regulation and legislation to facilitate introduction of new technologies and products must be balanced with consumer expectations.

Actions underway to reduce our on-farm emissions

The Commission's recommendations for on-farm actions needed to help reduce biogenic agricultural emissions over the three budget periods aligns very closely with the steps that Fonterra is already actively working towards, namely:

- In October 2020, every Fonterra farmer was given a farm-specific report on their biological greenhouse emissions.
- Every Fonterra farmer will have a comprehensive Farm Environment Plan (FEP) by 2025. By the end of the 20/21 season, over half our farmers will have a Fonterra Farm Environment Plan. We have also accelerated the roll-out in dairy dominated catchments such as Aparima, in Southland to ensure our farms there are rapidly adopting good practice.
- We have expanded our team of Sustainable Dairy Advisors to 40 staff to ensure we meet our 100% Farm Environment Plan target. This will assist our farmers in their commitments for freshwater and climate as well as allow us to consolidate our programmes into full integrated farm planning in the coming years.
- From 1 June 2021 Fonterra farmers meeting our on-farm sustainability and milk quality achievements will be eligible for a new Co-operative Difference Payment of up to 10 cents per kg of milk solids.

Adopt low emissions practices on-farm

New Zealand's dairy farmers are amongst the most carbon-efficient dairy producers in the world. The emissions intensity of our Co-operative's New Zealand dairy production is approximately one third of the global average. A litre of milk produced in New Zealand creates 0.91 kg of CO₂ emissions – compared to the global average of 2.5 kg of CO₂ emissions¹.

This efficiency has come through New Zealand's pastoral farming system, significant research and investment, and our farmers' willingness to continually adapt and improve their farming practices.

Over the last 25 years, New Zealand farmers have reduced the intensity of their on-farm biological emissions by about 20 per cent. These biological emissions include methane and nitrous oxide that are produced by ruminant animals, like cows, and to a lesser extent from on-farm use of fertilisers.

¹ FAO and GDP. 2018. Climate change and the global dairy cattle sector – The role of the dairy sector in a low-carbon future. <http://www.fao.org/3/CA2929EN/ca2929en.pdf>

Being a farmer owned New Zealand Co-operative, our role is to support our farmers, while acknowledging the autonomy of their farming businesses.

For many years our farmers have reduced the impact of their businesses on the environment and an example of this activity is that now 98 per cent of waterways on their farms are fenced. As part of our commitment to reducing the impact of farming on the environment, the Co-operative employs 40 full time Sustainable Dairy Advisors who create industry-leading Farm Environment Plans for Co-operative farmers.

All Fonterra farmers will have a Farm Environment Plan by 2025. Currently 43 per cent of our farmers have a plan, which is an increase from 23 per cent in 2019, and 12 per cent in 2018. These Farm Environment Plans are the primary advisory mechanism for supporting farmers to identify and achieve good farming practices. These will play a core role for providing farmers with advice on good farming practice actions that the Commission has anticipated as being required to meet the emissions reductions and subsequent carbon budgets.

In October 2020, every Co-operative farmer received a farm specific environmental report which combines a Greenhouse Gas Report and Nitrogen Risk Scorecard. Understanding the amount of emissions is the first step in building our farmers' awareness of their emissions profile, how they are performing relative to their peers and in identifying efficiency opportunities.

We have 68 Farm Source retail stores across New Zealand that supply farmers the products they need on farm. We partner with other organisations ensuring our farmers have access to smart technology such as soil moisture readers, on-farm energy assessments and vat monitoring while reducing the cost of these systems.

Examples of a Greenhouse Gas Emissions Report and a Nitrogen Risk Scorecard are attached as appendix A

He Waka Eke Noa

We are committed to the He Waka Eke Noa Joint Action on Climate Change Partnership. The milestones that are expected of the partnership are strongly aligned with the support Fonterra is currently providing our farmers, namely the provision of Greenhouse Gas Emissions Reports and Farm Environment Plans.

We believe that the He Waka Eke Noa partnership provides the agricultural sector with the right forum to consider how best emissions reductions can be achieved and supported by all farmers and growers across all land uses.

Fonterra is an active participant within the emissions reporting, farm planning and extension work-streams.

We support the actions identified in Chapter 4c (page 8 to 14) of the Primary Sector Agreement as being a suitable suite of tools that a farmer could implement through the adoption of a Farm Environment Plan. It should be noted that as farms are complex biophysical systems, each of these potential actions should be viewed as part of the toolbox for farmers to select and implement within a Farm Environment Plan that is specific for their farming situation.

Fonterra supports the mandatory use of Farm Environment Plans across all farm systems as they are a critical tool to enable on-farm change.

We have long been proactive in establishing systems and developing the support capability and capacity for the rollout of Farm Environment Plans with our farmers. We are committed to working collaboratively to find a solution to Farm Environment Plan data collection, integration and distribution.

We have committed to working with the Local Government New Zealand Regional Sector and others to find an integrated solution for our plans which would allow local and central Government to get access to the information they require.

We are also seeking to work with the Government to ensure that the mandatory use of plans includes appropriate minimum standards; that plans are regularly updated and audited; and that they are delivered by appropriately qualified people.

Resource Management Act reform

Fonterra supports improving the quality of New Zealand's freshwater and recognises that some land use activities have contributed to the degraded state of some waterbodies.

We look forward to continuing to work constructively with the Government on the National Policy Statement and National Environmental Standard concerning freshwater to ensure that New Zealand has both healthy freshwater and a thriving agricultural industry.

We note the Commission's pathway for agricultural emissions up to Budget 2 has a strong connection with the implementation of the Government's Resource Management Act Reform and Essential Freshwater policy. As regulation is developed and updated it will be critical to maintain farmer focus on continuous improvement to ensure that progress towards Budget 2 targets are not stalled by regulatory uncertainty.

We know from experience that on-farm change is more likely to be successful when farmers feel able to make changes because they are confident those changes will lead to the desired outcomes.

Fonterra's Co-operative Difference programme

We know that on-farm change can be challenging and can take time. In May 2019 we launched The Co-operative Difference programme which is part of our strategy to add more value to New Zealand milk and better respond to customer demands.

The framework helps deliver our strategy by providing farmers with direction and guidance in meeting the expectations of our customers and communities.

From 1 June 2021 we will introduce the Co-operative Difference payment. Up to 10 cents of each farm's milk payment (per kgMS) will be determined by the farm's sustainability credentials and milk quality.

The new payment recognises farmers who are already going above and beyond because they have innovated and invested early, and it also offers farmers more encouragement for taking the steps required to meet the changing expectations of customers and communities, both today and into the future.

We want to reward the on-farm efforts that demonstrate our Co-operative's care for the environment, animals, people and communities.

The 10 cent Co-operative Difference payment is made up of:

- 7 cents per kgMS for achievement under the Environment, Co-op & Prosperity, Animals, and People & Community focus areas.

Once these have been achieved;

- 3 cents per kgMS for milk that meets the 'Excellence' standard under the Milk Quality framework.

The Co-operative Difference framework was introduced in 2019 but the milk payment is new to farmers.

Maintaining the productivity of the sector

We support the introduction of policies that will reduce barriers for farmers to diversify their farming business.

As the Commission recognises, if stock numbers were to reduce this would not be a blanket rule across all farms and would more likely to be driven by some farmers choosing to convert to other land uses to best manage their environmental impact.

We are concerned that some of the assumptions underpinning the maintenance of historical productivity gains over Budgets 1 and 2 are very ambitious and will be extremely challenging to meet with measures currently available to farmers.

Historic productivity gains should not be presumed to be easily replicated, as these gains need to be achieved without increasing farming inputs. This means that the productivity gains of milk solids per animal can only be achieved by farmers putting in place strategies and practices that improve the individual animal performance and the management of pasture and crop management. In practice, achieving this type of behaviour change at the scale and within the timeline that is desired is challenging, and will require co-investment and partnerships between the Government and industry to support farmers.

It should be noted that the actions identified in Chapter 4c (page 8 – 14) of the Primary Sector Agreement will not always result in improved productivity and may result in absolute emissions reductions whilst increasing emissions per unit of product. As global food demand shifts towards seeking low emissions food production, there is a risk that some of the on-farm actions identified, such as once a day milking, when implemented at scale may result in products having a high footprint per unit of product. This may create additional market and consumer challenges.

There needs to be an ongoing partnership and investment between Government and industry aimed specifically at ensuring the productivity that has been budgeted on in the pathways is maintained.

Research and Development

We share the Commission's aspirations for higher value, environmentally sustainable farming systems.

While our farmers have been making good efficiency gains, the total on-farm emissions intensity has remained relatively flat since 2010 (accounting for land use changes and increases in brought-in supplementary feeds). Currently the main improvements farmers can deliver continue to come from adopting good management practices on farm such as being efficient with feed and fertiliser, having the right number of cows for the specific areas of land, reducing cow replacement rates and ensuring good animal health.

We welcome the development of a long-term plan for research and development, as outlined by the Commission, and believe a collaborative partnership between Government and industry will be key to creating new innovations to help farmers meet the emissions budgets. These partnerships may require new and innovative funding models, and we see the need for increased Government investment to support research and development.

Fonterra invests in research to reduce agricultural emissions and we are members of the BERG and the Pastoral Greenhouse Gas Research Consortium (PGgRC). We see the opportunity for breakthrough technologies which could reduce the biological emissions produced by cows and our ambition remains to develop affordable, accessible, relevant, and safe solutions for our farmers.

In Australia, we are partnering with Sea Forest Pty Ltd to see if including small quantities of *Asparagopsis* seaweed in cows' feed can reduce biological emissions in dairy herds at scale. In laboratory testing led by CSIRO, the seaweed has shown the potential to reduce the emissions from cows by more than 80 per cent. During the coming season, the prepared seaweed will be used as a supplement feed for several herds in Tasmania while carefully monitoring animal health, milk quality and milk production.

We have also signed a collaboration agreement with DSM which is based around DSM's product Bovaer® a methane inhibitor to reduce methane emissions on-farm. We need to know if we can achieve the same level of methane reduction in New Zealand's pasture-based farming system as the over 30% shown in other non-pasture farming systems overseas.

We are working with DSM to ensure that there are no residues in any of our milk products including concentrated milk products.

We have not made any commitments to our farmers as to a definite timeframe for when Bovaer® may be ready for commercial use in New Zealand. Rather, we have said that registration of the product in New Zealand is underway but there is no definite date for completion.

We continue to hold the view that Bovaer® is one of several greenhouse gas mitigation strategies which could potentially be adopted as soon as all safety, performance, regulatory, and market acceptance requirements are satisfied.

Fonterra is very mindful that successful methane mitigation solutions need to be cost-effective and easily adopted by farmers, and able to be counted against New Zealand's greenhouse gas inventory.

COVID-19 has highlighted the constraints many New Zealanders living in rural areas face with poor internet access. Increased connectivity would enable farmers to do business more efficiently while enabling the utilisation of smart technology such as soil moisture monitoring to enable more targeted use of irrigation; GPS enabled effluent systems; and improving the utilisation of the NAIT platform.

Encourage the development of robust regulation and legislation to facilitate introduction of new technologies and products

In order to achieve the ambitious emission budgets from Budget 3, science and technology are going to have to deliver us new tools beyond what we have now.

We strongly support science and innovation. We see genuine value in keeping our options open to the use of technology. The possibilities offered by new and emerging life science technologies such as gene editing could offer significant benefits for sustainable nutrition, animal welfare, human health, biosecurity and the environment.

We monitor closely developments across the world and recognise there is some interesting science being undertaken in this space. We are encouraged by the Commission's recommendations regarding new technology as emerging science and technology will be essential to New Zealand's decarbonisation journey.

As a company, we will continue to listen carefully to our consumers and customers as many place value in New Zealand's GE free status.

Land – Native & Exotic forests

- We accept that production forests will play an important role in meeting the first three emissions budgets, and new permanent native forests will also balance emissions from hard-to-abate sectors in the long term.
- We support the development of an appropriate forest management plan with Government, industry and affected communities to ensure that the right tree is grown in the right place, at the right time.
- We support the development of policies including changes to the NZ ETS and land use planning rules, to deliver the amount and type of afforestation needed over time to align with the Commission's advice on the proportion of emissions reductions and removals, and addressing intergenerational equity.

Actions undertaken to reduce our emissions

- We believe that New Zealand should not be reliant on forestry removals/offsets as a long-term policy option for carbon dioxide emissions.
- We continue to listen closely to the concerns of our farmers and the communities in which we operate about afforestation to ensure that the right tree is grown in the right place, at the right time.
- Through a partnership with Wildlands we created Plant for Good – a programme that delivers an end-to-end farm planting service nationwide at a discounted rate, helping to remove barriers for farmers having access to expertise and support for native tree planting.

Ramp up establishing new native forests – establish 25,000 hectares per year

Fonterra supports the use of new permanent native forests as an enduring carbon sink to help offset residual long-lived emissions over the long term. We support the Commission's pathway which requires at least 16,000 hectares of new native forests per year by 2025, and 25,000 hectares per year of new native forests by 2030 until at least 2050.

As the Commission notes, New Zealand has up to 1.4 million hectares of marginal land that is steep and prone to erosion that could be planted in forestry. Many working dairy farms have sections of marginal, less-productive land and we would encourage the Commission to undertake further analysis on how best to capture small blocks of new native forest plantations.

Planting is a key part of farming – whether for water quality, erosion control, biodiversity, carbon sequestration or for animal and farm welfare. Afforestation offers these same benefits, and we would like to work with the Government and our farmers on how best to participate in the provision of a well-managed long-term carbon sink.

We are extremely cognisant that many rural communities have concerns about the potential impacts of afforestation and we support the development of an appropriate forest management plan with Government, industry and affected communities to ensure that the right tree is grown in the right place, at the right time.

For many farmers, forestry will be integrated within productive farm-land uses. We encourage the Government to consider including a forest management plan within an overall farm management plan. We support the He Waka Eke Noa workstream that is considering ways to recognise additional types of sequestration and vegetation from areas on farms, like woodlots and riparian strips.

We support the Commission's recommendation to design a package of policies including changes to the NZ ETS and land use planning rules.

Many of the current NZ ETS criteria prohibit the recognition of the positive contribution of net emissions reduction farm forestry such as limits on planted forest area and dimensions (excluding shelterbelts), and the exclusion of biomass energy crops such as *miscanthus* because of tree species height limits. Farmers are currently disadvantaged by the NZ ETS rules as they receive limited credits for the adsorption from planting on all their land.

Average 25,000 hectares per year of new exotic plantation forests

Fonterra supports the Commission's pathway which requires 25,000 hectares per year of exotic afforestation out to 2030, reducing down to no new exotic afforestation for carbon removals by 2050.

As we have outlined in the *Heat, Industry and Power* section above, Fonterra requires large volumes of wood biomass as our preferred lowest abatement cost decarbonisation pathway for our manufacturing sites.

Overcoming constraints on biomass supply in some regions where there is not significant forestry will require the development of supply chains for gathering and processing biomass, along with the establishment of local markets. Biomass supply needs to be approached as a managed activity to ensure there are adequate amounts of biomass available for all uses. The challenge will be ensuring that biomass is located close to where it is required, as distance from source to site can add significant costs.

New exotic afforestation would help to provide biomass feedstock for the bioeconomy at the rates necessary for fuel switching. We would like to work with the Government and the biomass industry on the establishment of a bioeconomy (referred to in the Commission's Heat, Industry & Power recommendations).

We note that Te Uru Rākau (Forestry New Zealand) is already developing a sector transformation plan and includes bioenergy and other bioeconomy products as down-stream products.

Ramp down planting new exotic plantation forests for carbon storage

We support the Commission's recommendation that new exotic forestry should be to support net emissions reduction prior to 2050; but encourage the Government to consider the multipurpose nature of plantings including land management and bioenergy.

Waste and F-gases

- We support the setting of targets in the New Zealand Waste Strategy for waste reduction, resource recovery and landfill gas capture to reduce waste emissions in NZ by at least 15% by 2030.
- We support revenue collected from the waste levy being invested to reduce waste through resource recovery, promotion of reuse and recycling, and research and development on waste reduction.
- We support greater measurement and circularity of the economy by 2025.
- We support the expansion of product stewardship schemes to a wider range of products, prioritising products with a high-emissions potential.
- We support coordinated data collection across the waste industry before 31 December 2022.

Actions undertaken to reduce our impact

The Commission's recommendations for actions needed to help reduce emissions from waste over the three budget periods aligns very closely with the steps that Fonterra is already actively working towards, namely:

- To complete a publicly available packaging waste and recycling profile by 2025.
- Partnering with others to work on initiatives like Future Post to recycle Anchor milk bottles into fence posts; Moo2Shampoo with SKYCITY who turn milk bottles into shampoo, conditioner and lotion bottles; and partnering with Timpak and Reharvest Enviromulch to recycle our wooden shipping pallets by turning them into woodchip for places like playgrounds.
- To use natural refrigerants instead of F-gases in industrial refrigeration equipment.
- Support and promote the use of on-farm recycling and product stewardship for our farmers through the Co-operative Difference Programme.

Divert organic waste from landfill

Fonterra supports the Commission's recommendation that preventing waste at source is the most effective way to reduce emissions and could otherwise be used to potentially generate a renewable energy biogas source, followed by reusing recycling and recovering waste before it goes to landfill.

We would encourage greater consideration of ways to divert organic material from landfill to anaerobic digestors that could be used to generate biogas for injection into the North Island gas pipeline. The waste material from the biodigester could then be used for soil amendment, rather than being locked up in a landfill. See our previous comments in *Heat, Industry and Power* section above.

Our waste reduction journey

We are committed to reducing our footprint by using less packaging and making the packaging that we do use more sustainable. Packaging waste presents a significant challenge as we produce 150,000 tonnes a year.

We are focused on minimising decayable waste (primarily food, paper and wood) ending in landfill through a focus on at-scale composting and product recovery (to stockfood) processes in place. In the last year, we have achieved a reduction of 970 tonnes of waste to landfill on the previous year.

While packaging is a large component of our indirect waste, it is vital for delivering safe and quality nutrition, and plays an important role in reducing food waste. It's important we understand the source, the make-up and quality of the materials we use for our packaging and that it protects the product all the way from manufacture to consumption.

We are committed to reducing our footprint by making the packaging that we do use more sustainable. That means considering what happens to the packaging we use and how to eliminate waste across our value chain.

Collaboration is crucial to making progress towards reducing our waste footprint and together with our partners we have assessed the state of local recycling infrastructure, recycling standards and our level of influence in the markets where we operate.

We also know that we will need to work with our customers and consumers to encourage use of the available infrastructure in their location. We know our industry must continue evolving to remain economically and environmentally sustainable.

Overview of our global packaging portfolio

50% of all our packaging material is already recyclable in the market (e.g. cardboard)

13% is ready for recycling but there is limited infrastructure in market (e.g. rigid plastic)

24% is recyclable but the infrastructure is not widely available (e.g. liquid carton board)

13% is unsuitable for recycling (e.g. foil-based sachets)

Key considerations when changing packaging

When considering transitioning a packaging material we consider four key issues:

1. Ensuring the material meets and maintains our uncompromising standards of food safety and quality;
2. Ensuring the material meets and maintains export and import requirements across our global supply chains;
3. Ensuring our packaging meets recyclability and other environmental considerations using life cycle thinking; and
4. Consideration of how these associated costs will impact consumers and how to best mitigate them.

Challenges

We export 95 per cent of the products we produce to around 150 countries. Our global supply chain is complex with multiple packaging formats and materials and there are different waste and recycling infrastructures in each market.

A critical challenge for our business is to ensure our uncompromising standards of food safety and quality are maintained with whatever packaging we use. Packaging can also extend the shelf-life of a product and therefore reduce food waste.

Achieving a reduction in our packaging and waste footprint requires innovation, collaboration and circular thinking. We're proud to work on initiatives like Future Post to recycle Anchor milk bottles into fence posts, and Moo2Shampoo with SKYCITY who turn milk bottles into shampoo, conditioner and lotion bottles.

It also means continuously improving in the areas of manufacturing and distribution. Examples of this include diverting dairy by-products from landfill through Fonterra's subsidiary NZAgbiz (New Zealand's leading supplier of milk replacers, offering a range of products formulated with Fonterra milk-based products and Europe's finest vegetable-based ingredients) and converting used pallets into woodchips for playgrounds with the help of Timpack (a NZ owned, local pallet delivery business) and Enviromulch (a mulching company).

We are also involved with the existing product stewardship schemes, AgRecovery (New Zealand's solution for the safe disposal of unwanted agrochemicals and the recycling of empty containers, drums and IBCs) and Plasback (a scheme to recover used farm plastics for recycling), which provides a strong framework to support the priority products declaration. Fonterra has included farmers participating in a product stewardship scheme as one of the actions to be recognised in the Co-operative Difference.

Fonterra supports the establishment of product stewardship schemes for priority products to help ensure the packaging in use is supported by systems to collect and recycle these materials for further use. We support a collaborative, co-design approach to develop a product stewardship scheme to manage priority products throughout their lifecycle.

Waste Strategy

Fonterra supports the work currently underway to replace the New Zealand Waste Strategy 2010 and see the opportunity this provides for Government and industry to collaboratively set ambitious waste reduction targets and supporting policy.

We are particularly interested in how the strategy addresses the current tension between the high emissions potential of paper/cardboard packaging and the current focus of plastics minimisation, using life cycle thinking.

Successfully delivering on this new strategy will require greater inter-agency collaboration in order to remove obstacles to achieving the Commission's recommended emissions reduction pathway. For example, food-safety regulations currently restrict the ability of waste food re-use in non-human consumption, thereby limiting options to avoid landfill.

In order to address the challenges New Zealand faces moving towards our collective waste and recycling targets, the Commission could recommend that the Government consider the development of sector-specific roadmaps to align policy with investment strategy and establishment of infrastructure.

For example, an increase in paper and wood recovery needs to be matched with increased fibre recycling capacity or an increase in material/energy recycling capacity. Consideration also needs to be given to ensure that infrastructure investment is made where community, business and industry need is the greatest; and reflects what waste volume remains after waste reduction efforts.

Co-ordinated data collection

Fonterra supports a coordinated data collection across the waste industry before 31 December 2022. We are pleased to confirm that by the end of Budget 1, we will be in the position to publicly report on our packaging waste and recycling profile.

Reduce import of HFCs in second-hand products

Refrigeration plays a key role in the manufacturing and storing of milk products at our manufacturing sites. Most of our manufacturing refrigeration equipment already utilises natural refrigerants of ammonia and CO₂. However, there are several small HFC refrigeration packages in our fleet.

Fonterra refrigeration standards mandate the use of natural refrigerants for new industrial refrigeration assets. Whilst natural refrigerants are more environmentally friendly than HFCs, they are inherently more hazardous and therefore significantly more expensive due the required risk mitigation controls.

This is especially problematic with New Zealand's refrigeration contracting capability, given most of the contractor workforce come from a background of non-flammable, non-toxic synthetic refrigerants which require a much lower level of technical capability.

We encourage the phase-out of HFC refrigerants, but caution that the phasing out HFCs will force higher cost and high hazard refrigerants onto plant owners. The Government may wish to look at minimum training requirements for refrigeration technicians to help manage this risk, as such requirements currently don't exist.

We are seeing a growing number of heat pump applications using refrigerants for use in domestic households, such as space heating heat pumps and heat pump dryers. We believe that the importation of new equipment, especially domestic appliances, should be covered in F-Gas management.

We suggest further consideration be given to reducing HFC volumes by setting maximum global warming potential limits on refrigerants contained in imported equipment, both new and second-hand.

HFCs On-Farm

For our farmers refrigeration equipment is a key tool for their business and required to maintain the highest standards of food safety and quality.

We strongly encourage the Commission to recommend that the Government first work with the refrigeration industry and those industries that use refrigeration on the possible scale of the problem. Once this is known, possible solutions can be sought to reduce these types of emissions.

Any proposed changes to regulation must be accompanied by a realistic timeframe for implementation considering the significant change that is currently occurring on-farm to meet agricultural emissions reductions. If changes are progressed, we will support our farmers, helping me to innovate and adapt to change.

As the on-farm refrigeration service industry is made up of a lot of small providers, we are concerned there is currently a lack of awareness and long-term support for farmers. Additionally, we are concerned that the contractors who service these units may not have the right level of technical capability to appropriately manage the risk.

Multi-sector strategy

Fonterra's position on a multi-sector strategy

- We support the Commission's proposal to amend the price control settings on NZ ETS auctioning system to ensure it functions appropriately and enables New Zealand to more efficiently and effectively meet our climate change targets.
- We support the Commission's recommendation that the Government consider guidance on voluntary offsetting. This would help to ensure that voluntary and regulatory markets work together without creating additional constraints on New Zealand's emissions reduction targets, as well as unnecessary compliance and cost on ETS participants due to voluntary market participants competing for NZ ETS units. Clear voluntary offsetting methodologies could also support on farm planting that falls outside the NZ ETS due to planted area dimension or species requirements.
- We support the Commission's recommendation to continue phasing out industrial allocation.
- We see a potential opportunity for a complementary measure to be introduced to the reformed Emission Trading Scheme so the revenue generated from the auctioning system can be used to help businesses implement carbon reduction projects.

Disclosing climate related risks

Fonterra supports the concept of a fair and consistent climate-related financial disclosures regime, aligned with the Task Force on Climate-related Financial Disclosure (TCFD) recommendations. We agree that if the Government introduces a disclosures regime then reporting should be mandatory.

This will be important to help the Government meet its objectives of building a clear and comparable picture of climate-related risks and opportunities, and the financial impacts of these to the New Zealand business community.

We believe that a wider range of companies than just those listed on the NZX are exposed to climate-related financial risks and opportunities, and see it as important that they too are considering the impact of climate change and contributing to New Zealand's transition to a low-carbon future by managing these uncertainties.

As nearly half of New Zealand's greenhouse gas emissions come from the agriculture sector, including other dairy companies, we do not believe such other companies should be omitted from the reporting regime just because they are not listed. In the development of the framework, we encourage the Government to give further thought to appropriate criteria and 'size factors' which will determine which businesses may be captured in a new reporting regime.

A clear, comparable and consistent reporting framework is of the upmost importance to promote business certainty and fairness. For the proposed approach to be successful it is essential the Government publishes guidance and education material, including a common set of assumptions and New Zealand specific scenario analysis that can be referenced for reporting. This would not only help to reduce compliance costs; it would also help to set expectations in the first reporting year(s) so comparable and consistent reporting can be achieved faster.

Adjust ETS unit volumes and price control settings to align with budgets

Fonterra supports the Commission's intention to establish a well-functioning auction system for New Zealand Units (NZUs) to enable New Zealand to more efficiently and effectively meet our climate change targets.

We recently supported the introduction of the Confidential Reserve Price (CRP) through the Climate Change response (Auction Price) Amendment Bill to limit price divergence between auctions and the secondary market.

Moving forward we believe that policy certainty and transparency around key elements, such as carbon prices and budgeting, are essential to minimise volatility and to inform long-term decision making. An adequate supply of emission units will also be critical to a stable and well-functioning carbon market under any future system.

Clarifying the role and avenues for voluntary mitigation in New Zealand

We acknowledge the Commission's opinion that New Zealand should not be reliant on forestry removals/offsets as a long-term policy option for the reduction of carbon dioxide emissions.

While our primary focus remains on reducing our actual emissions through energy resilience at our sites, carbon offsets play an important role in providing businesses with the flexibility to choose the most economically rational means of making that transition over the recommended emissions reduction pathway.

We support the Commission's recommendation that the Government creates guidance on sustainable voluntary offsetting. This would help to ensure that voluntary and regulatory markets work together without creating additional constraints on New Zealand's emissions reduction targets, as well as unnecessary compliance and cost on ETS participants.

Emission Intensive Trade Exposed (EITE) allocation

We support the Commission's recommendation to continue phasing out industrial allocation as businesses should be responsible for their emissions and finding appropriate avenues to reduce or mitigate them.

There is a common misconception that Fonterra receives a large volume of free allocations as an Emission Intensive Trade Exposed (EITE) company. Fonterra does not receive any meaningful volume of EITE free allocations. Only our ethanol, whey powder, and lactose products – which account for less than 5 per cent of our annual emissions – are deemed to be "moderately emission-intensive" therefore Fonterra receives a 60 per cent allocation for the emissions associated with making these products.

Auction revenue recycling

Decarbonisation requires significant investment and we see a potential opportunity for a complementary measure to be introduced to the reformed Emission Trading Scheme so the revenue generated from the auctioning system can be used to help businesses implement carbon reduction projects.

The funding of complementary measures such as this fund could also come from the revenue generated to date from industry using the fixed price option for New Zealand Units.

Rules for measuring progress

Fonterra's position on rules for measuring progress

- We support the production-based approach from the national Greenhouse Gas inventory as the basis for accounting for emissions budgets and the 2050 target.
- We support a modified activity-based framework for land emissions accounting as shown by our support for He Waka Eke Noa.
- We support the development of methods to track emissions and removals from sources and sinks not yet included in New Zealand's domestic or international target accounting, as is demonstrated by our support to the He Waka Eke Noa Primary Sector Commitment.
- We support the Commission's recommendation that the Government should explore options for enabling voluntary mitigation and clarify the types of claims that can be made about it.

Accounting framework

We support the development of methods to track emissions and removals from sources and sinks not yet included in New Zealand's domestic or international target accounting, as is demonstrated by our support to the He Waka Eke Noa Primary Sector Commitment.

We ask that the Government consider the implementation of a modified activity-based framework on an economy wide scale, due to the complexity of farm-specific modelling. Whilst it would be desirable if the methods to aggregate the on-farm methods that He Waka Eke Noa is developing could be aggregated for an economy wide view, our experience with accounting at both a Co-op and on-farm level demonstrates complexity of aggregating results.

Voluntary offsetting and carbon neutrality

We are pleased to see the Commission acknowledge the role of voluntary offsetting as a tool to achieve carbon neutrality, and support the Commission's recommendation that the Government should explore options for enabling voluntary mitigation and clarify the types of claims that can be made about it.

In July 2020, we partnered with Foodstuffs North Island to launch the first certified carbonzero milk in the southern hemisphere, and one of just a handful in the world. Simply Milk has been certified by Toitū Envirocare. We've also worked with Toitū Envirocare to develop an emissions reduction plan for the product and have set a target to reduce Simply Milk's carbon footprint by 2.2% per bottle by 2024.

To complete the carbonzero process, we purchased verified carbon units to offset our unavoidable emissions which Toitū Envirocare surrender and cancel from circulation. These credits relate to projects undertaken both here in New Zealand and overseas and have been used to offset the carbon emissions of making Simply Milk. This includes the forest regeneration project in Kekerengu, South Island.

If there is any further information that would be of use to the Commission, please do not hesitate to contact us.

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