Case Study

Fonterra's Voluntary Climate-related Disclosure 2023

In November 2023, Fonterra published a voluntary set of Climate-related Disclosures (CRD) as part of our preparations to disclose our first mandatory Climate-related Disclosure required by law in New Zealand from FY24. We acknowledge the importance of identifying, managing, and disclosing material climate-related risks and opportunities in a consistent and comparable way. The CRD reflects Fonterra's best estimate and current understanding of future climate-related events, risks, opportunities, impacts, and strategies as at 9 November 2023. The CRD has been prepared to align as far as possible with the content that will be required from FY24 with Aotearoa New Zealand Climate Standards, while acknowledging some of the reporting criteria are not yet met.

We want dairy farming to continue for generations to come. This is why we have made a strategic choice 'to be a leader in sustainability'. This is essential in order to build resilience into the Co-op for future generations. We are aligned to the objective of keeping warming below 1.5°C. We have committed to set 2030 emissions reduction targets in line with the Science-based Targets initiative (SBTi) to help us toward our Net Zero 2050 ambition. We have taken some big steps on our climate journey already.

To view Fonterra's Climate-related Disclosure

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Te Kāwai Ārahi Pūrongo Mōwaho - The External Reporting Board (XRB) was enabled by New Zealand legislation to issue a mandatory climate-related disclosure framework for key New Zealand companies including large, listed issuers and financial sector entities. In response, the XRB issued the Aotearoa New Zealand Climate Standards 1, 2 and 3 (NZ CS 1, 2 and 3). The disclosure requirements are structured around four thematic sections, Governance, Strategy, Risk Management, and Metrics and Targets, alongside a number of general requirements and overarching principles. The Standards provide a consistent framework for organisations to consider and make decisions on the climate-related risks and opportunities for their activities over the short, medium, and long term.

The Standards are based on the leading framework recommendations of the Task Force on Climate-related Financial Disclosures (TCFD), a voluntary international regime. The XRB considers there to be a high degree of interoperability between the Standards and the international TCFD framework and International Sustainability Standards Board's (ISSB) standards. As TCFD has now fulfilled its remit, companies may continue to use the TCFD recommendations as they transition to ISSB's Standards.

Problem to solve

We are already experiencing the effects of climate change. Droughts, floods, and extreme weather are becoming more common. This reinforces how critical it is that we build resilience into the Co-op, so we're able to support farmer shareholders in looking after their land and cows to keep milk flowing. We are also exposed to the transition risks of climate change that come from increasing pressure on the world to decarbonise. These risks include shifting consumer preferences, changing regulations and trade and market access. Whilst these may present challenges, there are also opportunities Fonterra can leverage in the transition to a net zero future.

Scenario analysis

Scenario analysis is the process of exploring how an entity might perform under a range of plausible futures. The Aotearoa Circle Agriculture Sector Climate Change Scenarios were used as the foundation for developing Fonterra's climate scenarios for the FY23 CRD. These scenarios are not meant to be predictions of the future. Rather they challenge us to stress-test our strategy and business model under plausible socio-economic, technological, environmental, and political futures. These insights can help us build resilience, prepare for the risks and uncertainties we may encounter and leverage opportunities to lead the way in innovation and low-emissions sustainable dairy nutrition for generations to come.

The sector scenario work programmes led by the Aotearoa Circle have been influential in bringing together sectors across New Zealand to support climate reporting entities and encourage greater comparability of reporting. The XRB recognises the value of sector scenarios and encourages sector collaboration.

The Aotearoa Circle created three climate scenarios for the agriculture sector, which help meet the prescribed temperature scenarios mandated by the XRB:

- Orderly, temperature rise limited to 1.5°C (mandated);
- Disorderly, temperature rise limited to 2°C; and
- Hothouse, temperature rise increases past 3°C (mandated).

Fonterra worked to contextualise the Aotearoa Circle scenarios to reflect the dairy industry specifically as well as Fonterra's global operations and markets. Key differences are related to changing consumer behaviour relevant to the global dairy sector and technology developments. The below table summarises the three scenario narratives, including the additions and adaptations made by Fonterra to that of the Aotearoa Circle Agriculture Sector Scenarios.

These scenarios are designed intentionally to be challenging and are not meant to be perceived as 'most likely' outcomes.

	Orderly	Disorderly	Hot House
Scenarios	Net Zero 2050 Limit temperature rise to 1.5°C (with overshoot)	Delayed transition Limit temperature rise to 2°C	Hot house world Temperature rise >3°C
Key assumptions	– Orderly represents a world defined by a smooth transition to net zero – Climate policies and innovation are more immediate and gradually become more stringent	– Disruptive, costly transition as rapid and strong policy is implemented after 2030 – Physical climate worsens as critical tipping points are surpassed – Nationally determined contributions are not met	– Emissions rise unabated as fossil fuel use continues to increase – The physical impacts of climate change are severe, adapting to climate change is the priority – Fossil fuel continues to be heavily relied on for energy
Aotearoa Circle Agri Sector scenarios summary points	– Capital is easily accessible for organisations that show strong sustainability credentials – Insurance is costly to those exposed to physical risks – Shift towards sustainable diets that include a diverse range of proteins, but alternative sources predominate – Consumers increasingly seek products with environmental labelling and provenance stories that embed sustainability – Farmers and growers are incentivised to adopt sustainable practices and technology – Agricultural emissions are priced at the farm level in the early 2020s – Innovation is funded privately and publicly for on-farm technologies and freight and technology advances quickly	– Access to capital and insurance is available at a higher cost, but hard to access for those exposed to physical and transition risks – Countries not playing their part in the transition face higher trade barriers on global exports – Blunt policy interventions force rapid transition introduced in the 2030s, creating inequities across regions – There is still demand for animal protein, but most countries prefer to source locally – Demand for low-footprint products increases from the 2030s – Progress on technology was slow until the 2030s, then accelerated	– Access to capital is difficult with insurers and banks are unwilling to lend to those highly exposed to physical climate risks – No additional climate policies have been implemented since the 2020s with mitigation policy centred around the emissions trading scheme – Geopolitical tension and supply chain disruption increases, and cost of exporting has risen – Increase in urbanisation means food production suffers as rural communities decline and cost of farming increases – Food shortages and insecurity means New Zealand has lost its low-emissions competitive advantage and there is increased demand for cheap protein to feed growing populations – Lack of investment in technology means traditional agriculture's footprint remains high with innovation focused on adaptation – Growing methods such as vertical or indoor farming increase – Vulnerable countries have become uninhabitable, leading to a refugee crisis – Biosecurity is tightened due to influx of pests and diseases
Fonterra's climate scenarios summary points	– Customers put pressure on suppliers to drive emissions reduction – Alternative and lab grown proteins are common but a market for sustainable dairy remains – Dairy proteins produced through precision fermentation gain price parity – Consumers increasingly seek local produce with labelling and stories that embed sustainability – The development of energy-efficient and renewable process heat technologies accelerates – Methane inhibitors and gene editing innovations are developed to reduce emissions – Precision technologies on farm help reduce methane and drive regenerative farming	– Reactive regulation results in cumbersome and inconsistent reporting requirements for New Zealand farmers – Agriculture emissions are priced in the early 2030s – Low-emissions credentials win in the marketplace – Diversified proteins emerge and become cheaper than dairy – Failure to meet 2030 targets causes food and beverage companies to put pressure on suppliers or risk losing supply contracts – Government supports implementation of effective methane inhibitors from 2035 – Gene editing policy emerges encouraging low-emission plant breeds and cow genetics	– Agriculture emissions are not priced as food security is paramount – Consumer demand for dairy remains – Differentiation in the dairy market can be achieved based on innovation, food safety and quality and traceability – Indoor dairying is prevalent in New Zealand as physical conditions make it hard to maintain pastoral models – Delayed investment in alternative feed, leading to feed shortages

Anticipated impacts of climate-related risks and opportunities

We identified Fonterra's material climate-related risks and opportunities and their anticipated impacts through a series of workshops and prioritised them using a vulnerability and exposure risk assessment. We then identified anticipated impacts for each of these risks and opportunities, using the insights gleaned from scenario analysis as considerations.

Fonterra's strategic mitigations to climate-related risks

Risk	Description	Risk type	Location	Time horizon	Anticipated impacts	Strategic mitigations
Decrease in viability of dairy farming	Increases in temperature, coastal inundation, water availability, soil quality and acute weather events leading to a decrease in critical farming inputs (e.g. feed and fertiliser) and productivity of land to maintain viable farming, which may result in reduced milk supply and stranded assets in key regions.	Physical	New Zealand Australia	Medium Long	We anticipate that farming regions will experience increased frequency of climate-related events. Chronic impacts of climate change may impact pasture growth, water availability and prevalence of pests and disease on farm. Acute events may lead to increased heat stress events or damage on farm from extreme weather. This could lead to loss of productivity, decreased milk supply in some regions and/or compromised milk quality.	– Support on-farm preparedness through Farm Environment Plans – Continue to consider climate hazards in milk forecasting – Continue to partner with local government and industry groups for disaster response – Continue to provide financial support mechanisms for disrupted milk collection
Supply chain and manufacturing disruption	Increasing frequency and severity of extreme weather events impacting Fonterra's operational assets and/or supply chain, which may result in a major business disruption, product quality failure, increased operating costs and/or an inability to meet customer requirements.	Physical	New Zealand Australia	Medium Long	We anticipate some regions will face increased acute weather events and flooding, where damage to critical infrastructure could reduce our ability to collect milk, distribute finished goods, or access solid energy sources. Conversely, some regions may face increased drought conditions leading to water shortages affecting our ability to process milk. These events could disrupt business continuity leading to increased costs and operating complexity.	– Ongoing review and testing of business continuity plans and activation as required – Continue to partner with freight and logistics providers (e.g. Kotahi) – Operate a dynamic asset footprint to allocate milk effectively, maintaining business continuity through disruption
Changing customer and consumer preferences	Shift in customer and/or consumer preferences away from Fonterra products due to environmental credentials relative to competitors, which may result in a decrease in demand, price impacts, the ability to return sufficient value for farmer shareholders and/or a decrease in milk supply.	Transition	Global	Long	We anticipate there will be increased consumer interest in dairy alternatives such as plant-based or lab-derived options, but global demand for sustainable dairy will continue. Our ability to differentiate on sustainability will be critical. Our leading low-emissions dairy position coupled with our emissions reduction plans will help protect our long-term customer relationships and grow brand value. This will require ongoing investment, resource and partnerships to deliver our climate ambitions.	– Deliver our Climate Roadmap – Continue to develop sustainability solutions for customers, including partnership and co-investment opportunities – Continue to deliver on-farm support (e.g. Farm Environment Plans and Co-operative Difference)
Changing regulations and market access	Changes in local and global regulations creating an inability for the Co-op and farmers to meet compliance obligations, customer requirements and/or access markets, which may result in either a reduction in demand or supply.	Transition	Global	Medium Long	We anticipate the regulatory landscape will continue to prioritise climate activities alongside credible and transparent reporting. We also anticipate the global regulatory landscape will increasingly incorporate climate objectives, such as carbon border adjustment mechanisms, which will influence how we will access markets in the future. This will require ongoing monitoring and resource to effectively respond to regulatory changes.	– Monitor domestic and global regulatory landscape – Continue to participate in policy consultations – Advocate for our sustainability credentials to maintain market access – Continue to deliver on-farm support (e.g. Farm Environment Plans and the Co-operative Difference)
Limitations on access to financial and insurance products	Reduced availability of financial and insurance products for the Co-op and farmers due to the inability to meet institutions' increasing climate related requirements such as targets, performance and standards. This may result in increased operating costs, financial exposure and/or land-use change.	Transition	Global	Long	We anticipate financial institutions and insurance providers will continue to consider sustainability and climate in decision-making. We expect continued demand for transparent reporting and science-based targets to be influential in unlocking access to capital. This would require Fonterra to continue resourcing high standards of reporting and engagement with lenders on sustainability expectations .	– Continue to engage with financial institutions on Fonterra's Sustainable Finance Framework – Deliver our Climate Roadmap – Continue to report and share sustainability performance
Volatility in cost of carbon	Implementation and expansion of regulatory requirements relating to emissions pricing results in an increase in emissions-linked operating costs for Fonterra and our farmer shareholders, which may result in a decrease in the viability of dairy farming.	Transition	Global	Long	We anticipate there will continue to be ongoing developments with carbon pricing mechanisms both on and off farm. This would require support for farmers to help navigate emissions reduction opportunities. Ongoing forecasting and budgeting to manage carbon costs associated with manufacturing and operation emissions relative to our emissions reduction targets would also be required.	– Monitor carbon pricing developments – Continue to participate in policy consultations – Continue to participate and advocate through sector collaboration efforts

Fonterra's strategic climate-related opportunities

Climate-related opportunities are also built into the Co-op's long-term strategy and business plans. Capturing value from our leading low-emissions dairy proposition, including through our low-emissions solutions and customer partnerships, is a key opportunity. The benefits of our low-emissions solutions and customer partnerships are already beginning to be realised. Given the size of methane in our on-farm footprint and our Co-op's history of innovation we have an opportunity to lead in research and development of solutions for methane emissions. We believe there is a role for Fonterra's sustainable dairy nutrition to help meet future nutritional needs with adaptive and resilient farming systems delivering nutrition in the face of a changing climate.

Opportunity	Type	Time horizon	Description	Strategic priorities
Our sustainable dairy value proposition	Transition	Short Medium Long	Increasingly consumers are interested in where their food comes from and its associated environmental impact. New Zealand farmers are already among the world's most emissions-efficient dairy producers.[9] Our pasture-based system and focus on animal wellbeing are sources of differentiation for Fonterra when it comes to consumers and customers seeking sustainable dairy. This, coupled with our Climate Roadmap and targets can support our customers in meeting their climate ambitions.	– Continue to lead in low-emissions dairy at scale by reducing emissions in line with our targets and Climate Roadmap – Continue to offer sustainable solutions and work with customers on low-emission projects – Continue to collect bespoke environmental data on farm and support farmers with emissions reduction activities through Farm Environment Plans and The Co-operative Difference
The power of dairy nutrition	Transition	Short Medium Long	Consumers are increasingly interested in plant-based alternatives, a trend driven by several factors including a perceived lower environmental impact. However, much research shows there is variation in the nutritional composition amongst these products and milk remains a key part of the diet for a large portion of the global population.[10] Cow's milk and dairy products are nutrient dense foods, supplying energy and significant amounts of protein and essential micronutrients. Dietary guidelines around the world reflect the optimal nutrition dairy can provide, with the Food and Agriculture Organization estimating most countries recommend at least one serve per day and many recommend up to three serves per day.[11] The nutrient density of dairy coupled with the world's growing population creates opportunity for Fonterra to help support nutritional needs with low-emissions, sustainable dairy today and into the future. This is particularly true if future global milk pools are exposed to more severe impacts of climate change.	– Build on our 90+ years of research and expertise in dairy science, nutrition and technology – Strengthen our dairy solutions to deliver world class products – Support advocacy through established partnerships in science and nutrition, such as the Global Dairy Platform – Work with our recently appointed External Nutrition Expert Panel who provide independent expertise in relation to nutrition to Fonterra
A leading role in innovation to reduce methane emissions	Transition Physical	Short Medium Long	The way we produce dairy is efficient, but we know there is more to do. A high percentage of the GHG emissions in our footprint come from methane, which can be more challenging to address in pasture-based systems. We have a rich history of innovation and are well positioned to invest in research and breakthrough technologies that can be applied across our value chain for the benefit of farmers, customers, other stakeholders and our Co-op as a whole. This is in line with our strategic choice to be a leader in dairy innovation and science. We are also an active participant in global and domestic forums to help solve the methane challenge. Our unique emissions profile and way of farming drives Fonterra to find methane solutions. Our in-house intellectual property, such as Kowbucha™, as well as external collaboration efforts to commercialise effective solutions supports our climate ambitions, while making a positive contribution to the wider agriculture sector.	– Continue research and development in innovation for methane emissions reduction: • Kowbucha™ • Natural methane inhibitors from red seaweed • Synthesised methane inhibitors • Methane vaccines • Novel technologies – Invest NZD$50 million in AgriZero^{NZ}, a joint partnership with Government and agribusiness to accelerate reduction of agricultural emissions – Continue to partner and invest in the Pastoral Greenhouse Gas Research Consortium (PGgRc) to address emissions from the agriculture sector

9 Mapping the carbon footprint of milk production from cattle: A systematic review
10 Frontiers | Nutritional assessment of plant-based beverages in comparison to bovine milk (frontiersin.org)
11 Nutrition Hub – Factsheet Goodness of Dairy – Milk Composition RDAs and Health Benefits

Our strategic mitigations to the anticipated impacts are linked to our over-arching long-term strategy and business operations. Based on the outcomes of our strategic monitoring processes, we remain confident that the fundamentals that underpin our long-term strategy remain sound.

Next steps towards our emissions reduction targets and opportunities

In 2023, we released our Climate Roadmap and we committed to set near-term company-wide emissions reduction targets. We are currently in the process of submitting our targets to SBTi for accreditation.

- We have committed to reduce our absolute Scope 1 and 2 GHG emissions by 50% by FY30 from a FY18 base year.
- We have committed to reduce our Scope 1 and Scope 3 FLAG GHG emissions from dairy by 30% per tonne of fat-and-protein corrected milk (FPCM) by FY30 from a FY18 base year.

Our 2030 FLAG target aligns with the SBTi Forest Land and Agriculture Guidance. SBTi and SBTi FLAG means we are consistent with the science to limit global temperature increase to 1.5°C. Fonterra has selected the "commodity approach pathway" using the FLAG target setting tool, which means the target is intensity-based and specific to dairy.

Achieving our interim targets and our net zero 2050 ambition is subject to uncertainties and risks and is likely to be non-linear. The achievement of our 2030 Scope 1 and 2 emissions reduction target depends on our ability to successfully transition from coal via energy efficiency and fuel switching to renewable sources. Along the way we will take forecast milk volume and product mix into account along with the feasibility of transitioning from road to rail, reducing energy use through measures such as heat recovery, using biogas instead of natural gas where possible as well as the decarbonisation of our milk collection fleet and other decarbonisation activities.

Achievement of our 2030 Scope 1 and 3 FLAG target will require our planned investment and partnerships to come together with the right technological developments, government policy support and the adoption of on-farm practices.

We have separated our 2050 ambition from our 2030 targets, recognising that achieving net zero over the longer period to 2050 is inherently challenging for the global dairy sector. It will require significant action and coordination from Fonterra, government, industry bodies, partners, and our farmer shareholders.

In coming years, our annual scenario analysis process will expand in scope as our underpinning data improves. From 2024 onwards, in line with New Zealand's climate-related disclosures regime, we will conduct an annual climate risk assessment to maintain relevance and to continue to inform the development of our strategy and resilience building activities.

We will continue to monitor and manage key and emerging global risks as part of our integrated business planning process within the appropriate business functions and in line with potential impacts.

As a dairy Co-operative owned and supplied by farming families across New Zealand, we believe in the power of dairy to help meet global nutritional needs now and in the future. New Zealand farmers are among the most emissions efficient dairy producers in the world, making Fonterra a supplier of choice for sustainable dairy. However, our future depends on protecting the natural environment and climate change is one of the biggest challenges we face.

Fonterra has sought to provide accurate disclosures in its CRD as at publication, but cautions reliance being placed on representations that are necessarily subject to significant risks, uncertainties and/or assumptions. The risks and opportunities described in the CRD, and the forecast emissions reductions, may not eventuate or may be more or less significant than anticipated. Nothing in this document should be interpreted as capital growth, earnings or any other legal, financial tax or other advice or guidance.

For further information, please refer to Fonterra's full Climate-related Disclosure, including comprehensive descriptions of the forward looking nature of the statements, the significant risks, uncertainties and/or assumptions associated with the disclosure on *pages 2 and 30.*

For more information on our plans to achieve our climate targets and ambitions and the assumptions and uncertainties underpinning them, please refer to Fonterra's Climate Roadmap.