

Livestock Improvement Corporation Limited (LIC or the Co-operative)
Climate Statements

For the year ended 31 May 2024



There's always room for improvement



About these Climate Statements

As a large listed issuer on the New Zealand Stock Exchange (NZX), LIC is a Climate Reporting Entity (CRE). The scope of the LIC reporting entity includes all subsidiaries and aligns to the scope used for LIC's consolidated financial statements included in LIC's Annual Report 2024, available here www.lic.co.nz/shareholders/financial-results-announcements/. This is LIC's first set of Climate Statements prepared under the External Reporting Board's climate-related disclosure reporting framework. The Climate Statements are for the year ended 31 May 2024 and have been reviewed by LIC's Board of Directors.

This initial report is the start of LIC's climate reporting journey as we continue to integrate climate change considerations into governance, strategy and risk management processes. The disclosures comprising this climate statement comply in all respects with Aotearoa New Zealand Climate Standard 1, Climate-related Disclosures (NZ CS 1), in conjunction with adoption exemptions (and applicable conditions for relying on those adoption exemptions) available under Aotearoa New Zealand Climate Standard 2, Adoption of Aotearoa New Zealand Climate Standards (NZ CS 2), and are presented in accordance with Aotearoa New Zealand Climate Standard 3 (NZ CS 3), General Requirements for Climate-related Disclosures (together the NZ CS). For example, information is disclosed in the report where it is considered to be material, as defined in NZ CS 3, namely that "information is material if omitting, misstating or obscuring it could reasonably be expected to influence decisions that primary users make on the basis of an entity's climate-related disclosures". Primary users are defined as LIC's current and future farmer shareholders, lenders and other creditors.

Approved on behalf of the Board on 21 August 2024



Director

NZ CS 2 recognises that it may take time to develop capability to produce high-quality climate-related disclosures. LIC has adopted certain exemptions available under NZ CS 2 for this first report:

- Adoption provision 2, paragraph 12: Anticipated financial impacts of climate-related risks and opportunities reasonably expected by the entity, NZ CS 1 paragraphs 15(b), 15(c) and 15(d);
- Adoption provision 3, paragraph 15: Transition plan aspects of LIC's strategy, NZ CS 1 paragraphs 16(b) and 16(c). Refer to [page 25](#) for a description of LIC's progress towards developing transition plan aspects of our strategy;
- Adoption provision 4, paragraph 17: Scope 3 greenhouse gas (GHG) emissions, NZ CS 1 paragraph 22(a)(iii);
- Adoption provision 5, paragraph 18: Comparatives for Scope 3 GHG emissions, NZ CS 1 paragraph 40;
- Adoption provision 6, paragraph 20: Comparatives for metrics, NZ CS 1 paragraph 40; and
- Adoption provision 7, paragraph 22: Analysis of trends, NZ CS 1 paragraph 42.



Director

Disclaimer

These Climate Statements contain forward-looking statements, including climate-related metrics, climate scenarios, climate-related risks and opportunities, estimated climate projections, targets, assumptions, forecasts, and statements of LIC's future intentions.

This document reflects LIC's best estimate and current understanding of future climate-related events, risks, opportunities, impacts and strategies as at 21 August 2024, the date of publication. LIC has sought to provide accurate disclosures as at publication. Given the novel and developing nature of the information contained in these Climate Statements, as well as the inherent uncertainty of the subject matter, "accurate" does not entail certainty of outcome. It means that LIC has undertaken appropriate measures and implemented adequate controls such that the information presented is believed to be free from material error or misstatement and is otherwise fairly presented.

LIC cautions that forward-looking statements are not facts, but rather estimates and judgements regarding future results that are based on current estimates, and on current views of LIC which may be subject to change, and are necessarily subject to risks, uncertainties and/or assumptions. Estimates may prove to be incorrect due to unforeseen risks and general uncertainties of the business and environment we operate in, as well as due to the inherent uncertainty in the future impacts of climate change on our business and the dairy sector. LIC has used its best efforts to provide a reasonable basis for forward-looking statements but is constrained by the novel and developing nature of this subject matter. Climate-related forward-looking statements may therefore be less reliable than other statements LIC may make in its external reporting.

Descriptions of the qualitative and quantitative current and anticipated impacts and current financial impacts of climate change draw on and/or represent estimated figures only and have been developed using methodologies currently considered by LIC to be the most suitable. They are necessarily subject to risks, limitations, uncertainties and/or assumptions and change. In particular, the risks and opportunities described in this document, and the target emissions reductions, may not eventuate or may be more or less significant than anticipated. There are many factors that could cause LIC's actual results, performance, or achievement of climate-related metrics (including targets) to differ materially from that described, including economic and technological viability, as well as climate, government, and market factors outside of LIC's control.

These Climate Statements, including any financial information included, have not been subject to an external audit or independent assurance.

Nothing in this report should be interpreted as an offer of interests in financial products or earnings, capital growth, or any other legal, financial, tax, or other advice or guidance.

To the greatest extent possible under New Zealand law, LIC expressly disclaims all liability for any direct, indirect or consequential loss or damage arising directly or indirectly out of the use of or inability to use, or the information contained within, these Climate Statements.

Contents

INTRODUCTION	6
GOVERNANCE	7
STRATEGY	11
BUSINESS MODEL AND STRATEGY	11
CLIMATE-RELATED RISKS AND OPPORTUNITIES AND DECISION MAKING	13
CURRENT CLIMATE-RELATED IMPACTS	14
SCENARIO ANALYSIS	16
CLIMATE-RELATED RISKS AND OPPORTUNITIES	21
TRANSITION PLANNING	25
RISK MANAGEMENT	26
METRICS AND TARGETS	28
APPENDIX	34
GHG EMISSIONS METHODS, ASSUMPTIONS AND ESTIMATION UNCERTAINTY	34

Introduction

LIC is a New Zealand dairy farmer-owned co-operative and a leader in pasture-based dairy genetics and herd management. We exist to deliver superior genetics and technological innovation to help our shareholders farm profitable and sustainable animals. This is even more relevant to farmers today given the growing climate challenges we're facing. Who we are and what we do has never been more important for Kiwi farmers, our sector and New Zealand as our future depends on protecting the natural environment. The dairy sector needs to continue to evolve, for climate change and because of it, to retain ongoing market access.

At LIC, we are committed to reducing the emissions of our business. LIC has previously set emissions reduction targets based on science-aligned methodologies using SBTi (Science Based Target initiatives) tools and guided by the biogenic methane emissions reduction target in the Climate Change Response Act 2002, with the intention of reducing our greenhouse gas (GHG) emissions and contributing proportionately to the efforts to limit the global average temperature increase to 1.5°C above pre-industrial levels. While we have been working hard on reducing emissions, the organisation is currently in the process of reviewing our emissions reduction targets

and corresponding base year calculation to ensure that they are appropriate given the challenges the sector is currently facing with a lack of sufficient novel technology and innovation being available to achieve the targeted emissions reduction, as well as to reflect LIC's unique role in assisting the New Zealand dairy sector to drive down methane emissions. This means that the targets and base year calculations may change, and current disclosures should be considered with that in mind.

The physical effects of climate change are already intensifying and becoming more common, demonstrating the need for our business to be flexible and resilient in providing critical on-farm services to our farmer shareholders. Climate-related transition risks also present a potential challenge, including the risk of regulation and legislation change, impacts of innovation and maintaining dairy sector reputation and market access. LIC's business is largely driven by the size of the national dairy herd, which has been reducing over time and may continue to reduce in response to climate-related transition risk pressures. If the dairy sector is milking fewer cows, those cows need to be better ones. This creates a climate-related opportunity for LIC to help farmers identify and breed from their more efficient and profitable cows. Using

our genetic data relating to the national dairy herd, LIC has been able to model the genetic potential enteric methane emissions relative to milk solids production, indicating an improved trend over recent years attributable to better genomic selection.

LIC recognises the importance of identifying climate-related potential scenarios in a consistent and comparable way within the dairy sector. To this end, our Chief Executive was a member of the Leadership Group that developed the Aotearoa Circle's Agriculture Sector Climate Change Scenarios.¹ Building on these scenarios, we have adapted the three possible future sector scenarios to LIC's specific circumstances to better understand our climate-related risks and opportunities. These scenarios are not predictions of the future, rather they challenge us to consider our strategy and business model under plausible socio-economic, technological, environmental, and political futures. These insights can help us build resilience, prepare for potential risks and uncertainties, and identify opportunities to lead the way in innovation and herd improvement.

¹Aotearoa Circle Agriculture Sector Climate Change Scenarios

Governance

Climate Governance at LIC

Figure 1

Governance Body

LIC Board of Directors (the Board)	
Audit Finance & Risk Committee	People & Culture Committee

Management

LIC Senior Leadership Team (SLT)

SLT members with specific climate responsibilities

Chief Executive Officer	Chief People Officer	Chief Scientist	Chief Financial Officer
-------------------------	----------------------	-----------------	-------------------------

Other management roles with specific climate-related responsibility

General Counsel	Health, Safety & Environment Manager	Senior Environmental Advisor	Group Financial Controller	Representatives from each LIC business unit
Environment & Sustainability Management Committee, also includes Chief People Officer & Chief Scientist				

LIC Board of Directors

The primary responsibility of the Board in relation to risk management is to ensure that it develops a clear understanding of the fundamental risks and rewards implied under LIC's business model and strategy, overseeing and holding management accountable and setting appropriate risk appetite for LIC. As part of their governance duties, our Board has visibility and oversight of sustainability and climate-related risks and opportunities. The Board approves and is ultimately responsible for our overall climate strategy, material initiatives, frameworks, targets, metrics, and policies.

The Board monitors progress against and oversees achievement of climate-related metrics and targets. Governance responsibility in relation to climate has been kept at the full Board level at this stage, although the Audit, Finance and Risk Committee (AFRC) oversees elements of climate-related risk, and the People & Culture Committee has the responsibility for terms of remuneration of the Chief Executive and oversees People policies (for more information in relation to how metrics and targets are included in remuneration policies, refer to the Metrics and Targets section of these climate statements).

LIC's commitment to managing the environmental impact of our products, services, and work activities, enhancing our environmental performance and achieving continual improvement, including in relation to our farmer shareholders, is documented in an Environmental Policy, which is approved by the Board every two years.

During the reporting period, the Board held ten meetings. Climate-related risks, opportunities and/or reporting requirements were discussed at seven of those meetings. The AFRC held six meetings during the reporting period. Climate-related risks and/or reporting requirements were discussed at all of those meetings.

More information on our Board and Board committees can be found in our Annual Report 2024².

²LIC's Annual Reports are available at www.lic.co.nz/shareholders/financial-results-announcements/

The Board's oversight of climate-related risks and opportunities (Table 1):

<p>Processes and frequency by which the Board is informed about climate-related risks and opportunities</p>	<p>Climate-related transition and physical risks and opportunities were discussed with the Board in May 2023 and further workshopped in March 2024. The Board endorsed the approach of climate risk being a sub-category risk in LIC's risk management tool as it impacts more than one of LIC's key risk areas. Updates on LIC's key risk areas (including, where identified, climate-related risks) are presented at each meeting of the Audit, Finance and Risk Committee. Progress on material climate-related opportunity initiatives is reported by management to the Board at every meeting through traffic light reporting and individual papers where relevant. As implementation of climate-related reporting is still in the early stages, full climate-related risk and opportunity information has been discussed with the Board at multiple meetings during the reporting period. Management is developing regular reporting for material climate-related risks and opportunities, with an update being provided to the Board at every Board meeting.</p>
<p>How the Board ensures that appropriate skills and competencies are available to provide oversight</p>	<p>As part of the Director election process, skills are considered including Sustainability on Farm, which includes climate change expertise related to the dairy sector. Our Board Chair is a member of Fonterra's Sustainability Advisory Panel, and another Director is also a Director on Fonterra's Board and a member of Fonterra's Sustainability & Innovation Committee. Other Directors and members of management have taken individual responsibility for increasing their climate capability through attending relevant conferences and courses and climate-related matters are being considered in planning Director development. Management recruitment has included experts in GHG emissions and environment advice, and management have worked with the Board on ensuring that compliance requirements are well understood.</p> <p>The Board Chair and Chair of the People & Culture Committee work with the Chief People Officer on a forward program of development for the Board and individual directors, which includes developing climate-related competency.</p>
<p>How the Board considers climate-related risks and opportunities when developing and overseeing implementation of strategy</p>	<p>Material climate-related risk and opportunity initiatives are considered as part of the annual planning and budgeting process. For example, this year's capital budget included installation of solar panels at Head Office and the R&D operational budget included expected spend on climate-related opportunity initiatives. Moreover, LIC's strategy includes Environment and Sustainable Co-op as key pillars. Material investments are presented separately to the Board for budget approval.</p> <p>For further information in relation to LIC's climate-related risk and opportunity initiatives, refer to section titled "climate-related risks and decision making" in the strategy section of this climate statement.</p>
<p>How the Board sets, monitors progress and oversees achievement of metrics and targets</p>	<p>GHG emissions targets, results and progress relative to the baseline year are presented to the Board annually and the Board discusses further initiatives, metrics, or targets that may be required based on those results and progress. Environmental Strategy and Energy Strategy documents are also reviewed by the Board. Progress on material climate-related risk and opportunity initiatives are reported on as part of Board traffic light reporting by the Chief Executive and regular reporting outside of traffic light reporting is also being established.</p> <p>For further information in relation to the metrics and targets that LIC currently has in place and whether these are incorporated into remuneration policies, refer to the metrics and targets section of this climate statement.</p>

LIC Senior Leadership Team

Day-to-day management of risks and opportunities within the Co-operative is delegated to members of LIC's Senior Leadership Team (SLT) and other senior leaders, as shown in Table 2 and Figure 2. While the wider SLT monitors and discusses climate-related risks and opportunities and endorses content to go to Board meetings, the members identified in Table 2 have significant responsibilities related to climate-related risks and opportunities.

The SLT meets fortnightly, with quarterly strategy offsites, and those meetings have included a range of environmental topics since the beginning of the reporting period, including: updates on environment and sustainability, climate reporting, Environment and Sustainability Strategy 2024-2027, Energy Strategy 2024-2030.

The Environment and Sustainability Management Committee (ESMC) includes two SLT representatives, meets quarterly and focusses on identifying and driving environmental risks and opportunities for improvement across the business. Any new climate-related risks raised can be integrated into LIC's risk tool for assessment and control and/or mitigation identification and material risks would then form part of management discussions and AFRC reporting.

SLT members with specific climate-related responsibilities (Table 2):

Chief Executive Officer	<ul style="list-style-type: none"> Responsible for managing and delivering the Co-op's strategy and performance Responsible for management of climate-related risks and opportunities Attends all Board and sub-committee meetings
Chief People Officer	<ul style="list-style-type: none"> Oversees Environmental Policy, environment strategic plans, GHG data management and reporting Attends ESMC Attends People & Culture Committee
Chief Scientist	<ul style="list-style-type: none"> Oversees climate-related R&D initiatives Attends ESMC
Chief Financial Officer	<ul style="list-style-type: none"> Aligns LIC's reporting on climate-related risks and opportunities with NZ CS Considers financial implications of climate-related risks and opportunities in financial planning, capital allocation and financial reporting Oversees Sustainability Reporting Attends Board and AFRC meetings

Other management roles with climate-related responsibility (Figure 2):

Environment & Sustainability Management Committee, also includes Chief People Officer & Chief Scientist

General Counsel

Oversees sustainability and climate-related legal risk. Attends Board meetings, where required attends subcommittee meetings. Monitors upcoming legislative change and reports potential impacts to AFRC.

Health, Safety & Environment Manager

Drives compliance with environment legislation, development and execution of environment policy and strategy, oversees GHG reporting, Chairs ESMC.

Senior Environmental Advisor

Drafts, implements and maintains environment policy, systems and strategy, manages GHG data gathering and reporting, facilitates ESMC and works with business unit members on initiatives.

Group Financial Controller

Oversees climate and sustainability reporting, considers financial implications of climate-related risks and opportunities in budgeting and financial reporting. Attends AFRC, presents to Board on climate and sustainability reporting.

Representatives from each LIC business unit

Employees passionate about driving continuous improvement to reduce waste and reduce our environmental impact.

- LIC’s Transformation Office reporting tool categorises environmental initiatives to enable centralised reporting of all relevant environmental or sustainability initiatives
- LIC’s Investment Committee considers requests for funding and approves the internal emissions price: business cases for initiatives are required to include any environmental considerations and a monetary impact if GHG emissions are estimated to be impacted by more than 10 tCO₂-equivalent emissions per year
- LIC’s R&D team includes scientists with relevant skills and experience working on climate-related opportunities

Strategy

Business Model

LIC is a New Zealand dairy farmer-owned co-operative and LIC shares are listed on the NZX. To be a shareholder in LIC, you have to farm dairy cows in New Zealand, supply a New Zealand milk processor and buy a minimum amount of qualifying products and services from LIC every season. As a farmer-owned co-operative, all of our profit is returned to our farmer shareholders in dividends or reinvested into new solutions and research and development (R&D).

LIC's headquarters are in the Waikato, along with laboratories, herd testing facilities, a dairy farm and bull farms. Additional bull farms are in the Central North Island. Herd testing and artificial breeding depots are located throughout the North and South Island.

LIC's principal activities are carried out in New Zealand, including artificial breeding products and services, herd testing of milk samples, DNA testing, animal health testing, herd management software, on-farm support and consultants, sale of heat detection and animal tag products and research and development (R&D).

The majority of LIC's customers are dairy farmers, or professionals such as vets providing our services to dairy farmers. LIC is structured to best support farmers and our operational teams to effectively supply products and services to customers, which results in a significant volume of vehicle travel to dairy farms in rural areas. For artificial breeding products and R&D purposes, LIC owns or oversees a large volume of elite bulls, a dairy herd and trial animals.

LIC has smaller business operations in Australia, UK and Ireland, mainly for the purpose of selling artificial breeding products collected in New Zealand, and owns a small business manufacturing bovine heat detection products in Australia.

Strategy

The Board is responsible for setting the strategy of LIC and monitoring delivery against that strategy, recognising the company's economic, environmental and social responsibilities. In 2021 the Board refined LIC's business strategy and purpose: to deliver superior genetics and technological innovation to help farmer shareholders sustainably farm a profitable animal. Value for farmer shareholders is at the heart of our strategy (Figure 3).

Our strategy makes three commitments to our farmer shareholders: operational excellence, faster genetic improvement and software reliability and performance. Faster genetic improvement specifically commits to having farmers' backs when it comes to helping them meet the environmental challenges we face as a sector, in particular through animal efficiency and methane mitigation.

In October 2021, LIC pledged its support for 'Pathways to Dairy Net Zero'³, a global initiative which aims to accelerate climate change action and reduce GHG emissions across the dairy sector.

Our three-year plan (which runs to 31 May 2027) includes climate-related initiatives, some of which will bring long-term genetic benefits - the most significant impact we can make is through helping farmers to reduce the environmental footprint of the national dairy herd. Working with dairy farmers, including via processors such as Fonterra, to help farmers accelerate their herd improvement is important to help the sector to reduce its overall emissions.

³Home - Pathways to Dairy Net Zero

LIC is running a number of long-term trials, resulting in a significantly higher volume of trial animals included in our biogenic methane emission results compared to our 2018/19 emissions base year. This will likely continue while there are still opportunities identified to reduce emissions through genetic improvement requiring a R&D focus, or other areas of genetic improvement needed within the dairy sector.

As a result, LIC's own Scope 1 biogenic methane emissions may not reduce until we have advanced the work to help the national dairy herd to reduce methane emissions and we are currently reviewing this target to ensure that it reflects likely progress of R&D initiatives over time. Improving genetics is a long game, but we are confident that our initiatives will result in benefits to the sector through more emissions-efficient, heat tolerant and more productive animals.

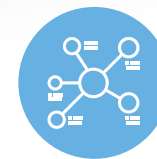
Although LIC is committed to ongoing reduction of emissions, we recognise that new technologies will be required to further reduce our emissions out to 2050, creating uncertainty around how we will continue to reduce emissions without using some form of carbon credit offset in future. For example, much of LIC's vehicle travel is over long distances in rural areas so feasible alternatives to diesel-fuelled utes and light trucks will be critical, as well as lower emission fuelled air travel.

LIC's strategy (Figure 3)



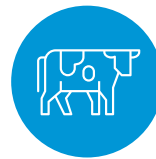
Our Farmers

Deepen our understanding of the current and future needs of all of our farmers.



Data & Digital

Modernising the animal data & digital capabilities.



Animal

Most sustainable & efficient animal. Highest value products.



Innovation

Research & development. Responsive innovation.

Climate-related risks and opportunities and decision making

Climate-related risks fall into two main categories: physical and transition risk factors. These have the potential to affect LIC's entire business, including through impacts of those factors on our dairy farmer customers, and are taken into account as an input to LIC's internal capital deployment and funding decision-making processes, along with climate-related opportunities, as described below.

Physical risk

Physical risk factors are those related to the impacts of the changing climate and can be further categorised as acute or chronic:

- Acute risk factors are those related to more frequent and intense extreme climate events such as heatwaves, droughts, bushfires, floods and storms; and
- Chronic risk factors are those related to gradual changes in climatic conditions such as increasing temperatures, changes in precipitation patterns and sea-level rises.

Transition risk

Transition risk factors are those related to the process of transitioning towards a climate-resilient and lower emissions society where transition pathways may vary and can be further categorised as arising from these changes:

- Policy changes, including policies and regulations impacting both the broad economy as well as those impacting the dairy sector;
- Innovation changes, including developments in farming practices and alternative proteins; and
- Market and reputation changes, such as shifts in consumer preferences or market access impacts.

The number of cows in the national herd is a key assumption considered as part of LIC's strategic planning process and underpins our expected five-year activity level in relation to product sales. In addition, the biggest asset on LIC's balance sheet is our bull team. There is a complex, inter-related mix of factors impacting

the number of cows (including climate-related risks and opportunities), such as challenges with succession planning on farm, farmers seeking to diversify their operations, changing land use, volatility of milk price and the high cost of capital for new entrants. Seasonal milk prices are an additional key assumption: a low milk price can generally result in lower levels of activity with farmers seeking to reduce costs. The risk of low milk price could be increased by climate-related factors, such as market or reputation transition risk, but can also have an inverse relationship. Where weather conditions contribute to global supply being lower than demand, milk price could be stronger.

LIC's Investment Committee has set an internal emissions price to be used as a tool to calculate a financial impact when considering climate-related opportunity or risk initiatives. The results factor into capital investment decisions to ensure that decarbonisation opportunities are considered in a similar way to any other initiative. The financial analysis template LIC uses for considering costs and benefits of proposed initiatives, including climate-related risks or opportunities, has been updated to include a financial impact of GHG emissions reduction using the internal emissions price. Where an initiative will change LIC's GHG Scope 1 or Scope 2 emissions by more than 10 tCO₂-equivalent per year, the business is required to include a GHG monetary impact factor in the financial analysis.

In 2023 we went through a process to identify the most material physical and transition climate-related risks relevant to LIC and ensured that those risks were included in LIC's risk register. After discussion with management, AFRC and the Board decided that climate-related risk should be represented as a sub-category risk in LIC's risk management tool. This was on the basis that there are a range of different climate-related risks that impact more than one of LIC's key risk areas, enabling risk appetite for the different types of climate risk to continue to be set for those overarching key risk categories, and to be factored into capital deployment and funding decision-making.

LIC's material climate-related risks and opportunities are detailed on [page 21](#).

Current climate-related impacts

Current climate-related physical impacts

While the effects of climate change are expected to intensify over the coming decades, a number of impacts are already being observed. Seasonal impacts are becoming more frequent, although not all climate events or impacts experienced translate into material impacts for LIC.

Impact	Description of impact	Current financial impacts
Drought or dry summer conditions	Dry conditions in some areas may have caused early dry-off of cows. Early dry-off impacts LIC's activity levels, for example cancelled herd testing of milk.	It is not possible to identify any lost revenue in the reporting period that is specifically attributable to drought or summer conditions exacerbated by climate change, as farmers may have had multiple reasons for cancelling a product or service, including lower milk price or the cost of feed outweighing the benefits of extra days in milk.
Weather events	Extreme weather events caused disruption to LIC production and services, damage to LIC assets and disrupted farmer operations, resulting in cancellation or delay to LIC services. For example, South Island flooding impacted some farmers during September 2023.	<p>Weather events during the period were sufficiently temporary to not materially impact LIC services provided on farm or result in a material financial impact for LIC but are nevertheless material impacts in that they indicate a trend of extreme weather and accordingly have an influence on LIC's planning for its exposure to this risk on an ongoing basis.</p> <p>In the previous year, there was a \$0.15m claim for repairs relating to a lightning strike on 29 January 2023 which occurred at the end of the Auckland Anniversary weather event. This caused damage to an electrical board that managed LIC's fire protection systems at the head office building. The claim was paid out in the current reporting period.</p>

Current climate-related transition impacts

Impact	Description of impact	Current financial impacts
Legislation and regulation	<ul style="list-style-type: none"> LIC is impacted by regulatory change and uncertainty in NZ relating to climate policy, as well as general emissions reduction policies Resources allocated to collate data, perform analysis, prepare and review Climate Statements 	<p>\$0.1 million</p> <p>Excludes employee time</p>

Impact	Description of impact	Current financial impacts
Efforts to reduce LIC's emissions or reduce environmental impact risk	<ul style="list-style-type: none"> • Installation of more than 480 solar panels at Hamilton head office to reduce LIC's energy emissions • Ongoing transition of vehicles to electric vehicles (EVs) and hybrids to further reduce LIC's fuel emissions • Further additions to LIC EV charging station network • Ongoing discussions with suppliers to reduce waste, increase recycling, improve efficiency and access to emissions data • Other asset replacements to reduce climate impacts • Resources allocated to update Environmental Strategy and prepare Energy Strategy 	<p>\$0.6 million</p> <p>Not all costs are able to be separately identified (such as electricity supply for EV charging stations, change in costs solely due to electrification of vehicle fleet), excludes employee time</p>
Investments in climate-related research	<ul style="list-style-type: none"> • Continued investment in climate-related opportunity research projects to assist farmers to reduce emissions or adapt to climate-change through improved genetics in future, including methane validation trials and a heat tolerance breeding program. 	<p>\$1.6 million (excludes external funding)</p> <p>Although R&D time is captured, this is not used to create separate financial records for all initiatives</p>
Climate change training	<ul style="list-style-type: none"> • External training on climate statement requirements for relevant employees, education sessions on potential impact of climate-change risks on the dairy sector for employees • Ongoing discussions with our dairy farmer customers on how improvement to herd genetics can assist in decreasing emissions intensity • LIC runs a sustainability survey annually to gather information from employees on flexible working and commuting patterns to gather data for estimating Scope 3 employee commuting emissions. The survey is also designed to understand the level of awareness across our employees of LIC's environmental disclosures, policies and procedures, as well as to seek feedback from employees. There was good engagement on our 2024 survey, with a 41% response rate. 	<p>No identifiable additional cost in the period</p>

Scenario analysis

The Aotearoa Circle Agriculture Sector Scenarios⁴ were used as the foundation for developing LIC's climate-related scenarios for this report. 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.

LIC's scenario analysis process involved engagement and governance at a number of levels of the organisation:

- Chief Executive and another SLT member engagement with the Aotearoa Circle in developing the Agriculture Sector Scenarios
- Analysis and input from key management resources
- Reviews and discussion at both SLT and Board level
- Final approval of outputs at Board level

LIC did not enlist the help of external partners and no external stakeholders were involved, with the exception of elected directors, who are farmer shareholders in LIC. LIC intends to seek the views and input of external stakeholders in future reporting periods when reporting processes are more developed.

LIC determined that the Aotearoa Circle Agriculture Sector Scenarios⁴ were the most relevant and appropriate starting point because they have been created specifically for agribusinesses operating in New Zealand's agricultural sector, including LIC. Moreover, the scenarios were aligned to the temperature requirements in NZ CS 1, including to have a 1.5 degree scenario, a 3 degree or greater scenario, and a third climate-related scenario. The Aotearoa Circle created three climate scenarios for the sector, which help meet the prescribed temperature scenarios as set out in NZ CS 1:

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

⁴Aotearoa Circle Agriculture Sector Climate Change Scenarios

Scenario analysis is the process of exploring how an entity might perform under a range of plausible futures. In a world of uncertainty, scenario analysis is meant to challenge 'business as usual' assumptions. Climate-related scenario analysis does not predict the future, but rather provides a range of hypothetical outcomes to enable an entity to better assess how physical and transition risks and opportunities associated with climate change could impact its operations.

Scenario narratives

Climate-related scenario narratives are plausible, challenging descriptions of how the future may unfold and provide the parameters in which an entity conducts scenario analysis to test overall strategic resilience based on a coherent and internally consistent set of assumptions about key driving forces and relationships covering both physical and transition risks in an integrated manner. Climate-related scenarios are not intended to be probabilistic or predictive, or to identify the 'most likely' outcome(s) of climate change. They are intended to provide an opportunity for entities to develop their internal capacity to better understand and prepare for the uncertain future impacts of climate change. Accordingly, all outcomes described in our climate-related scenarios are only insights to assist in resilience testing and strategy development and are not predictions of actual future outcomes.

Scenario narratives are determined by the interaction of key social, technological, economic, environmental, and political 'drivers of change' that may influence an entity's operating environment. These narratives include assumptions and logical relationships to help identify potential impacts and severity of the impacts, on operations, strategy, and financial planning.

LIC has adapted the Aotearoa Circle Agri-sector scenarios to reflect LIC's role in the dairy sector specifically. This process involved analysis by management of the Aotearoa Circle scenarios, which LIC's Chief Executive was directly involved in developing, together with workshops with both SLT and the Board to develop impact pathways specific to LIC. These outputs were then integrated with narrative specific to LIC to shape the scenario narratives, which have been reviewed by the full Board. This has been a standalone process, which is intended to become part of regular strategy reviews over time.

Key differences between Aotearoa Circle's scenario narratives and LIC's scenario narratives relate to focussing primarily on changes relevant to LIC's role within the dairy sector and technology developments. Table 3 summarises the three scenario narratives and the key assumptions underlying each. It is worth noting that scenarios are designed intentionally to be challenging and are not meant to be perceived as 'most likely' outcomes.

Scenario assumptions and narratives - Table 3

	Orderly	Disorderly	Hothouse
Scenarios	Net Zero 2050 Limit temperature rise to 1.5°C (with overshoot)	Delayed transition Limit temperature rise to 2°C	Hothouse world Temperature rise > 3°C
Key climate scenarios and models used	<ul style="list-style-type: none"> Intergovernmental Panel on Climate Change (IPCC) Representative Concentration Pathway (RCP) 2.6/SSP-1 Scenarios dataset for the Climate Change Commission's 2021 Final Advice: Tailwinds data set Ministry for the Environment 2018 Climate change projections for NZ Ministry for the Environment 2022 Interim guidance on the use of new sea-level rise projections 	<ul style="list-style-type: none"> IPCC RCP 4.5/SSP-2 Scenarios dataset for the Climate Change Commission's 2021 Final Advice: Headwinds data set Ministry for the Environment 2018 Climate change projections for NZ Ministry for the Environment 2022 Interim guidance on the use of new sea-level rise projections 	<ul style="list-style-type: none"> IPCC RCP 8.5/SSP-5 Scenarios dataset for the Climate Change Commission's 2021 Final Advice: Current policy reference data set Ministry for the Environment 2018 Climate change projections for NZ Ministry for the Environment 2022 Interim guidance on the use of new sea-level rise projections
Brief description	Represents a world defined by a smooth transition to net zero CO ₂ by 2050. Global warming is limited to 1.5°C through stringent climate policies and innovation. Assumes climate policies are introduced immediately and become gradually more stringent as 2050 looms. Both physical and transition risks are relatively subdued. Achieving net zero by 2050 reflects an ambitious mitigation scenario.	Represents a world with little policy action until after 2030, after which strong, rapid action is implemented to limit warming to 2°C. Countries and territories use fossil-fuel heavy policies to recover from Covid-19, so emissions increase, and nationally determined contributions are not met. It is only after 2030 that new climate change policies are introduced, but not all countries take equal action. Consequently, physical and transition risks are higher. This is a costly and disruptive transition.	Describes a world in which emissions continue to rise unabated beyond 2050 as no additional climate change policies are introduced. Fossil fuel use continues to increase, and so global CO ₂ emissions continue to rise. The physical impacts of climate change are severe. There are irreversible changes such as ice sheet loss and sea level rise. Adapting to climate change has become the priority.

	Orderly	Disorderly	Hothouse
Time horizon	Short (to 2026/27), medium (2027-2035) and long (2036-2050) term, with 2050 being the endpoint, with the exception of Hothouse where the temperature continues to increase beyond 2050 to exceed 3°C by 2080		
Climate impacts	Lowest - The physical impacts of climate change have increased water stress in some regions. Storm damage still poses high risks across large parts of the country.	Medium - Physical climate worsens as critical tipping points are surpassed.	Highest - The physical impacts of climate change are severe.
Scope of operations	The climate scenario analysis was focused on LIC's New Zealand operations. International factors were considered where material, such as consumables manufactured offshore or shipping of product sold to international markets. The climate scenario analysis also focused primarily on the dairy sector, referencing the work done by the Aotearoa Circle on the agriculture sector.		
Policy & Socioeconomic assumptions	<ul style="list-style-type: none"> Climate policies and innovation are more immediate and gradually become more stringent Shift towards sustainable diets that include a diverse range of proteins, but still a market for premium animal products Some farmers were supported to transition out of agriculture in unsustainable areas and policy targets were met, with significantly lower cow numbers resulting Alternative and lab grown proteins are common, but a market for sustainable dairy remains Consumers increasingly seek local produce with labelling and stories that embed sustainability 	<ul style="list-style-type: none"> Disruptive, costly transition as rapid and strong policy is implemented after 2030 Reactive regulation results in cumbersome and inconsistent reporting requirements for New Zealand farmers Some farmers had to reduce, diversify, move, or liquidate Collectives that have worked together to drive transformative change have seen rewards Gene editing and selection policy has emerged 	<ul style="list-style-type: none"> 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 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, including dairy, to feed growing populations Vulnerable countries have become uninhabitable, leading to a refugee crisis
Dairy herd impact - critical assumption/ uncertainty	30% smaller dairy herd than 2020 by 2050	17% smaller dairy herd than 2020 by 2050	13% smaller dairy herd than 2020 by 2050

	Orderly	Disorderly	Hothouse
Macro-economic trends	<ul style="list-style-type: none"> Large food-producing corporate customers apply pressure on processor suppliers to drive emissions reduction, who in turn incentivise farmers to reduce emissions Funding/capital is easily accessible for organisations & farms that show strong sustainability credentials Insurance is costly to those exposed to physical risks Agricultural emissions are priced at the farm level in the early 2020s 	<ul style="list-style-type: none"> Failure to meet 2030 targets causes food companies to put pressure on processor suppliers or risk losing supply contracts Access to funding/capital and insurance is available at a higher cost, but hard to access for those exposed to physical and transition risks Diversified proteins emerge and become cheaper than dairy Operating costs increase faster for emissions-intensive costs/organisations Carbon-border adjustments have shrunk NZ's animal product exports Agriculture emissions are priced during the early 2030s Low-emissions credentials win in the marketplace 	<ul style="list-style-type: none"> Access to funding/capital is difficult with insurers and banks unwilling to lend to those highly exposed to physical climate risks Agriculture emissions are not priced as food security is paramount Indoor dairying is prevalent in New Zealand as physical conditions make it hard to maintain pastoral models
Energy pathways	Energy supply is mostly decarbonised, with 98% of electricity from renewable sources, and 89% of total energy from renewable sources.	Since 2030, there has been a rapid shift to low emissions energy, but there is still a way to go. 76% of total energy consumed is renewable.	Energy remains reliant on high-emitting fuels. Renewable sources provide 46% of total consumed energy.
Carbon sequestration and afforestation	There is widespread use of carbon capture and storage (CCS) globally, though only a few cases in New Zealand. Pine and native forestry grows strongly, with biodiversity protection a key criteria for approval of new forests.	Focus on emissions reductions leads to large areas of pine monocultures. Rushed and costly global push for more CCS tech, though not really seen in NZ.	Little use of CCS globally. Pines continue to be planted for timber, but native forestry is not incentivised.
Nature based solutions	Indigenous and regenerative agriculture practices have been broadly implemented across the sector.	Only localised biodiversity projects that have climate co-benefits are funded.	<ul style="list-style-type: none"> Adaptation is the priority. Biosecurity is tightened due to influx of pests and diseases

	Orderly	Disorderly	Hothouse
Technology assumptions, including negative emissions technology	<ul style="list-style-type: none"> Sustainable farms have consolidated and leveraged technology. Innovation is funded privately and publicly for on-farm technologies and technology advances quickly. Methane inhibitors, genetic improvement and gene editing innovations are developed to reduce emissions. Precision technologies on farm help reduce methane and drive regenerative farming. 	<ul style="list-style-type: none"> Progress on technology was slow until 2032 then accelerated, but with regional discrepancies. Government supports implementation of effective methane inhibitors from 2035. Gene editing policy emerges encouraging low-emission cow genetics. 	<ul style="list-style-type: none"> Lack of investment in technology means traditional agriculture's footprint remains high with innovation focused on adaptation. Growing methods such as indoor farming increase. Delayed investment in alternative feed, leading to feed shortages. Differentiation in the dairy market can be achieved based on innovation, food safety and quality and traceability.

Scenario analysis insights

LIC's analysis of climate-related risks found varying degrees of impact on the co-op across the three scenarios and time horizons. The above narratives are intended to bring to life the critical uncertainties in how LIC's operating context could evolve over time under possible futures, by describing relevant narratives and comparing them across scenarios, with the most significant factor being the potential impact on the size of the national dairy herd. While they are shaped by global and New Zealand scenario methods and assumptions, which make specific assumptions about how the context will evolve, they are still qualitative and exploratory in nature. Climate scenarios are not predictive, they are not forecasts, nor do they represent any preferred options. They test a broad range of plausible and challenging outcomes to generate useful insights on potential climate risks, threats and opportunities.

In an Orderly Scenario, LIC would be particularly exposed to transition risks given the scale and pace of change required to reduce emissions in the short to medium term, with the most significant outcome explored in the narrative for LIC being a 30% smaller dairy herd than 2020 by 2050.

A Disorderly Scenario represents a more volatile and uncertain operating context for LIC, with a reduction in the dairy herd of 17% by 2050. In this scenario, a slow approach by others to reduce emissions would mean the Co-operative's ability to maintain profitability in the face of transition changes would be challenging due to rapidly increased operating and capital costs, particularly as greater exposure to physical risks are experienced with global temperature increase reaching 2°C.

In a Hothouse Scenario, although the dairy herd may have had a smaller reduction by 2050 of 13%, LIC would be particularly exposed to the physical risks of climate change given New Zealand's reliance on a stable, temperate climate for dairy farming. Unfavourable climate conditions under this scenario could challenge the productivity of our pasture-based system without significant farmer adaptation and our ability to access farms to provide critical services could be severely disrupted by major weather events.

We intend to continue to develop our climate scenario analysis to help inform strategy over time.

Climate-related risks and opportunities

LIC's material climate-related risks and opportunities and the anticipated impacts that we currently consider we can reasonably expect are detailed in Tables 4 and 5. Management used the outputs of our risk identification process, together with insights from the above scenarios, to develop impact pathways specific to LIC. The impact pathways were then workshoped with both SLT and the Board.

The anticipated impacts are described in qualitative terms and linked to a series of risk responses and/or mitigations.

The time horizons LIC considers for strategic planning and the time horizons that LIC used to assess its climate-related risks and opportunities are:

- Short-term - risk over the next 3 years to 2026/27, in line with LIC's three-year plan cycle
- Medium-term - risk within the horizon from 2027 to 2035
- Long-term - risk within the time horizon from 2036 to 2050

Global population growth is a critical assumption in relation to the dairy sector, with a resulting potential impact on demand for LIC products and services. Shared Socioeconomic Pathways⁵ (SSP) developed for differing climate scenarios suggest that the global population could continue to grow until at least 2050 and, with increasing focus on healthy food options, the global demand for dairy will also likely increase. Although we expect that the national dairy herd will continue to decline, LIC's products and services have become more important and relevant than ever to ensure that farmers can keep increasing productivity on farm with less cows, and those cows need to be more emissions efficient. We expect that demand for some LIC products and services will increase, such as animal health testing given the importance of animal welfare under nature-based principles and to ensure optimum, healthy efficient animals.

Climate-related risks - Table 4

Risk	Description	Risk type	Time horizon	Anticipated impacts	Strategic mitigations
Government policy and regulations	Action could be taken to constrain emissions-intensive activities, including: <ul style="list-style-type: none"> • de-stocking or land use regulation • farmgate emissions pricing • additional tax on emissions-heavy inputs (e.g. fuel) 	Transition	Medium Long	<ul style="list-style-type: none"> • Reduction in cows or farmer profitability could lead to reduced LIC revenue • Potential for climate-related litigation • Increased costs related to compliance and farmgate emissions pricing 	<ul style="list-style-type: none"> • Monitor regulatory change • Continue to participate in policy consultations • Continue to promote importance of herd improvement • Collaboration on R&D methane reduction programme • Taking action to reduce LIC's emissions • Farm Environment Plans for LIC farms

⁵SSP Database (Shared Socioeconomic Pathways) Scenario Explorer

Risk	Description	Risk type	Time horizon	Anticipated impacts	Strategic mitigations
Innovation	Emerging technology and R&D to enable a lower-carbon industry creates challenge to keep up with the rate of global change, risk that novel technology development fails to deliver	Transition	Medium Long	<ul style="list-style-type: none"> • Cost of adoption could reduce farmer profitability, which could lead to reduced LIC revenue • Risk of falling behind in innovation • Potential for insufficient innovation to support achievement of aspirational climate targets and timeframes • Increasing technology costs, particularly in relation to rapidly growing data 	<ul style="list-style-type: none"> • LIC continues to invest heavily in R&D and IT development • Monitor both NZ and global innovation progress • Memorandum of Understanding with AgriZero^{NZ} to work cooperatively on agricultural emissions reductions
Market and reputation	Shifts in supply and demand as consumer preferences change, including increased use of non-animal products, market access and reputation risk if dairy farmers do not achieve emission intensity reductions	Transition	Long	<ul style="list-style-type: none"> • Reduction in farmer profitability could lead to reduced LIC revenue • Potential for carbon border adjustments could reduce farmer profitability, which could lead to reduced LIC revenue 	<ul style="list-style-type: none"> • Working closely with dairy processors to promote herd improvement importance • Continue to report sustainability performance • R&D initiatives
Decrease in viability of dairy farms	Potential for decrease in productivity and output of the dairy sector due to changes in mean rainfall and temperature, seasonality, weather extremes. Impact of heat stress or changes in the distribution of invasive species and diseases increasing animal health issues	Physical	Medium Long	<ul style="list-style-type: none"> • Early dry-off due to drought can result in LIC service cancellations, such as herd testing • Reduction in cows, farmer profitability or cancelled services could lead to reduced LIC revenue • Increasing challenge for both LIC and farmers to secure financing and insurance, increase in cost • Serving remote areas may become unprofitable 	<ul style="list-style-type: none"> • Continue to promote importance of herd improvement • R&D investment, including improving animal heat tolerance, and data integration investment • Taking action to reduce LIC's emissions • Continued review of crisis plans and annual crisis simulations • Continue to report sustainability performance and share with banking and insurance partners

Risk	Description	Risk type	Time horizon	Anticipated impacts	Strategic mitigations
Supply chain and distribution disruption	Increasing frequency and severity of extreme weather events impacting LIC's supply chain, which may result in a major business disruption, increased operating costs and/or an inability to meet customer requirements	Physical	Medium Long	<ul style="list-style-type: none"> Reduction in farmer profitability and/or disrupted services could lead to reduced LIC revenue Flight cancellations during artificial insemination peak season would have a material impact Increased shipping and airfreight costs of supplies and overseas distribution, challenges with getting international product to market on a timely basis 	<ul style="list-style-type: none"> LIC mitigates supplier risk where possible by advance ordering and delivery of critical consumables, at least a year in advance for inputs used in peak season products and services, supplies of frozen semen straws held in market or as a back-up Crisis planning
Road access, electricity and/or water supply disruption	Extreme weather events could result in more frequent and lengthy road closures, power outages and water supply, as well as potential restrictions due to drought	Physical	Medium Long	<ul style="list-style-type: none"> Reduction in farmer profitability and/or disrupted services could lead to reduced LIC revenue Lengthy road closures could impact time-critical on-farm services, particularly artificial insemination Increased cost of electricity/water 	<ul style="list-style-type: none"> Installation of solar panels, together with battery systems, and generators to support critical services Crisis planning
People	Health impacts for some LIC workers and in the dairy sector generally from exposure to more extreme weather and potential for increased heat stress	Physical	Medium Long	Dairy sector may become less attractive to work in	<ul style="list-style-type: none"> Heat stress risk included in health and safety policy and procedures for relevant business units Continue sponsorship and support of sector, including industry awards

LIC's material risks relate to the dairy sector and New Zealand, unless stated otherwise above.

Climate-related opportunities - Table 5

Opportunity	Description	Type	Time horizon	Anticipated impacts	Strategic mitigations
The power of herd improvement	<p>Increased use of premium genetics, DNA, animal health and milk testing by farmers to identify and maximise productive and healthy animals and reduce emissions intensity of dairy animals.</p> <p>Potential for change in regulations in relation to gene editing and cloning to provide more R&D opportunity</p>	Transition	Short Medium Long	<ul style="list-style-type: none"> The results some farmers are achieving show that if we sharpen our focus on herd improvement, we can reduce intensity of emissions and continue to have the world's most efficient dairy herd Potential to increase LIC revenue to help offset reductions related to decrease in cow numbers 	<ul style="list-style-type: none"> Farmer shareholder engagement on how LIC can improve herd productivity and reduce emissions intensity R&D initiatives, including current methane emissions reduction breeding programme in collaboration with CRV and Pāmu, and with funding from the NZ Agricultural Greenhouse Gas Research Centre Working closely with dairy processors to promote herd improvement importance
Improve heat tolerance of dairy animals	Heat stress has significant welfare implications for animals. For dairy cows it can also impact feed intake, milk production, fertility, and calf birth weight. Introducing the 'slick' gene into the country's dairy herd could allow for a significant improvement in dairy cow performance in hotter temperatures over the long term.	Physical	Medium Long	<ul style="list-style-type: none"> Increased heat resilience of the national dairy herd over time Potential for new LIC international sales in the longer-term 	R&D heat tolerant breeding initiative
Support services for farmers	Increase support of farmers with consultancy services or labour assistance	Transition Physical	Short Medium Long	Potential to increase LIC consultancy services and on-farm labour support revenue	<ul style="list-style-type: none"> Recruitment into FarmWise consulting service Farm assist teams have been consolidated into one service with a higher proportion of permanent employees
Increase genetics international sales	Where pastoral based systems become more cost effective in other countries, NZ genetics can be seen as more attractive	Transition Physical	Short Medium Long	Potential to increase LIC's proportion of international revenue	Monitor international markets and work with our distributors on opportunities to increase genetics sales offshore

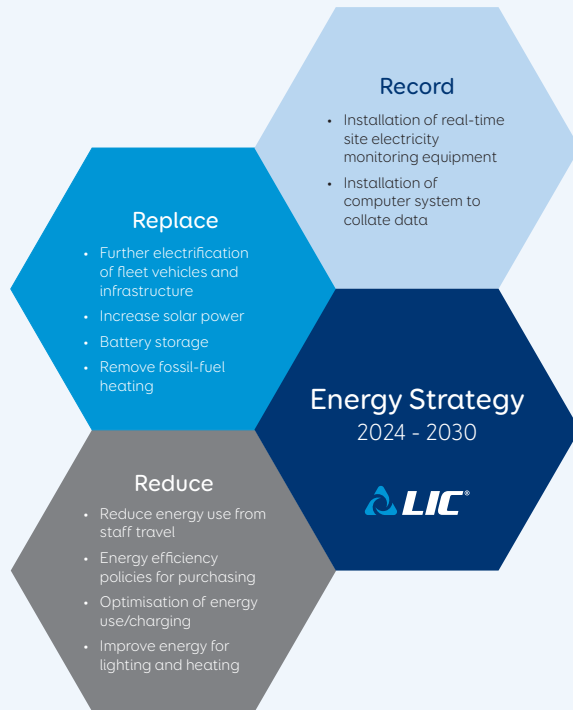
LIC's material opportunities relate to the dairy sector and New Zealand, unless stated otherwise above.

Transition planning

During the period LIC updated our Environment and Sustainability Strategy for the next three years. Included in the strategic objectives shown in Figure 4 is developing our transition plan out to 2050 over the next year.

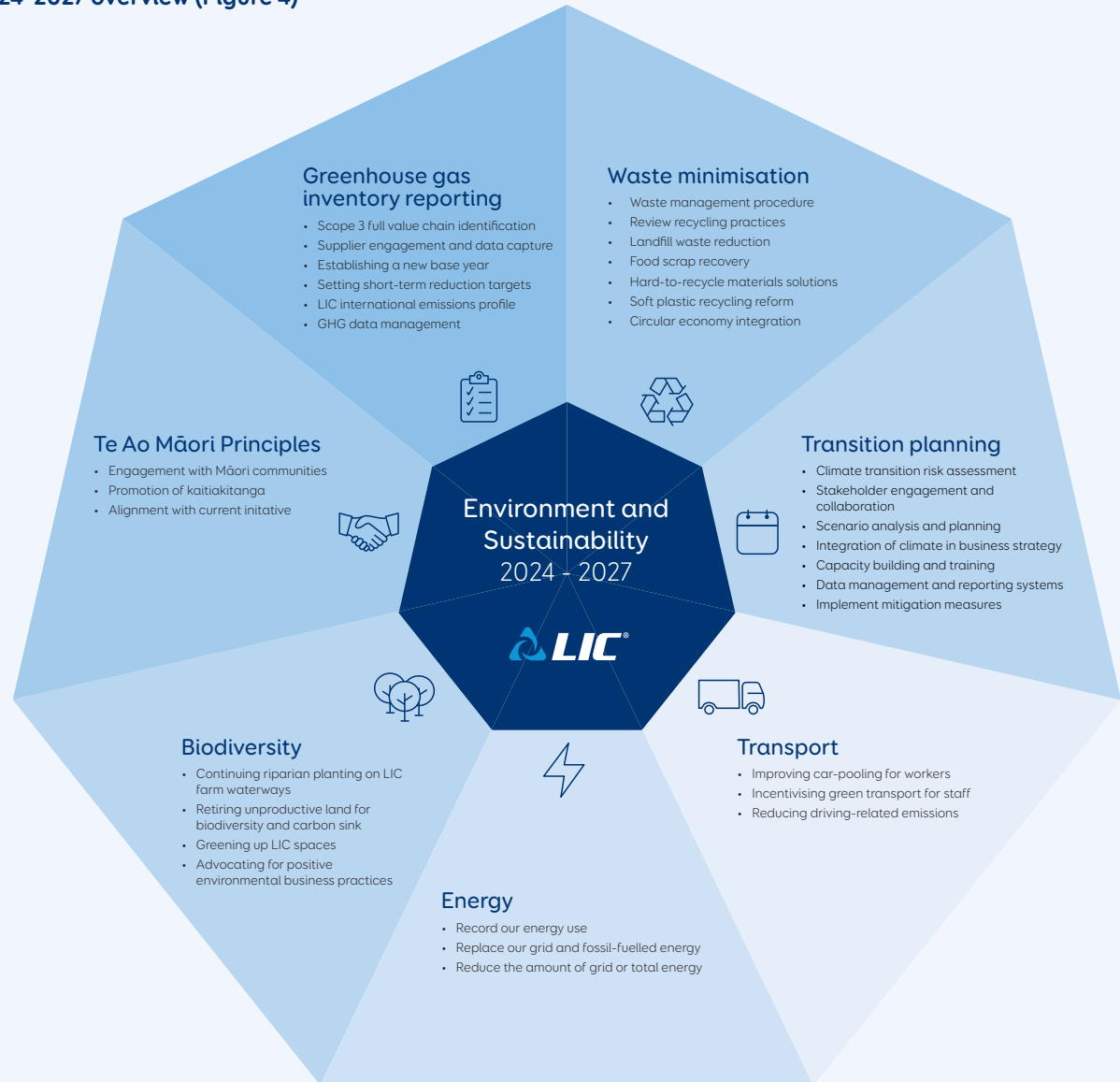
LIC has also developed a 2024-2030 Energy Strategy. Three key focus areas have been identified to achieve this (Figure 5).

LIC 2024-2030 Energy Strategy overview (Figure 5)



LIC's dairy farm and bull farms also have Farm Environment Plans in place.

LIC Environment & Sustainability Strategy 2024-2027 overview (Figure 4)



Risk Management

As a pasture-based dairy co-operative, the importance of identifying and managing impacts of weather patterns that have the potential to drive financial and strategic impacts on our business has long been part of our business practices. Regular assessment of potential impacts of climate-related risk is part of our forecasting on at least a quarterly and sometimes monthly basis, as well as during annual crisis plan reviews for assessing the ongoing sustainability of our business. Refer to the Strategy section for detail on the scenario analysis process and the time horizons LIC considers for strategic planning and to assess its climate-related risks and opportunities.

The AFRC, on behalf of the Board, is responsible for ensuring that management has established a risk management framework that includes policies and procedures to effectively identify, mitigate and monitor key enterprise risks. The AFRC regularly reviews LIC's key enterprise risks and receives risk updates at AFRC meetings. Risk owners review risks at least annually.

LIC's Risk Management Policy sets our approach to risk management. LIC is committed to a proactive approach to the identification, quantification and management of risk and has implemented a structured risk management framework to assist management and the Board to identify, manage and mitigate key enterprise-wide risks. Once identified, risks are captured in an online tool, assessed using a combination of the likelihood and consequence of the risk occurring and controls and key risk indicators identified. Risks are reviewed and controls self-assessed at least annually or as needed and internal audit reviews are completed on key controls on a rotating basis over time. LIC also has a separate Legislative Compliance Policy. Potential and actual legislation and regulation changes are monitored and changes material to LIC are reported to AFRC at least annually.

In 2023, we used the National Climate Change Risk Assessment for Aotearoa New Zealand⁶ to identify the most material physical climate risks relevant to LIC. We also considered the climate-related transitional risks as defined in NZ CS 3.

⁶National climate change risk assessment for New Zealand - Main report | Ministry for the Environment

We cross-referenced those risks to LIC's risk register and identified any gaps where risks needed to be added to the register. The majority of the risks were found to be already covered within existing risks. Climate transition or physical risk was added as a sub-category to those risks in order to be able to separately report on climate-related risks from the risk register. LIC also has a separate health & safety risk register, which includes people-specific climate-related health risks for sub-business unit areas, such as the risk of heat stress. The AFRC and Board decided that climate risk would be a sub-category risk in LIC's risk management tool as it impacts more than one of LIC's key risk areas, enabling risk appetite for the different types of climate risk to continue be set for those over-arching key risk categories. All categories of risks are considered equally and using a sub-category for climate-related risks means the appropriate risk appetite for an overall risk category can be consistently applied to different types of climate-related risk.

As part of the scenario analysis process, high level impact pathways developed in relation to climate-related physical and transition risks helped to identify potential impacts and opportunities specific to LIC. No parts of the value chain were specifically excluded for the purposes of scenario analysis and the identification of climate-related risks and opportunities.

LIC runs a crisis simulation exercise at least annually and in 2023 ran a crisis simulation of a major weather event materially affecting our head office and artificial breeding production laboratory during LIC's peak season, with the results of the exercise reported to AFRC. This helped to further assess the potential impact of a major weather event.

Global megatrends and emerging risks are monitored on an ongoing basis by our Commercial business unit and Risk & Assurance team, reported to the Board and AFRC and also used to review key risks identified.

Further detail on the components of LIC's risk framework is outlined in Table 6, including how climate-related risk is integrated into the components.

Integration of climate risk within LIC's risk management framework - Table 6

LIC Strategy	LIC's strategic direction is set by the Board and implemented by the SLT, including consideration and management of climate-related risks and opportunities.
Risk Management Policy	LIC's Risk Management Policy sets our approach to risk management and risk appetite settings across ten key categories: Health & Safety, Disruption to Product or Service, Brand Damage, Compliance Risk, Financial Risk, Bio-Security & Animal Health, Market Disruption, Strategic Risk, People & Capability and Information Security Risk. Climate-related risks are a sub-category across these categories. This policy is reviewed at least every two years.
Risk Appetite	The Board sets risk appetite for LIC's key risk categories, enabling risk appetite in relation to different types of climate-related risk to still be set based on the overall category of risk. For example, LIC's Board has set a low-risk appetite for Compliance risk, which includes non-compliance with climate and environment related legislation and regulation. Disruption to Product or Service risk appetite is set for low risk during LIC's artificial breeding peak season, which includes disruption from weather events, resulting in concentrated crisis and business continuity planning for a potential event during peak season.
Risk management tools	LIC uses an online tool to manage risk and internal audit points. Climate-related physical and transition risk are used as risk sub-categories in the tool. Another online tool is used for managing health & safety and environment regulation compliance risk, including heat stress risk. Controls and actions resulting from reviews, audits or events are also tracked in these tools. Critical LIC processes are documented in a Business Impact Assessment, LIC has crisis management plans, runs at least annual crisis simulations and all business units have business continuity plans and health & safety plans. Risk documents are updated for any known changes or reviewed at least annually.
Business processes	Risk management updates are provided to SLT and AFRC on a regular basis, including any risks outside of risk appetite or key risk indicators outside of limits, as well as corresponding actions being taken. Risk environment monitoring is included in forecasting and budgeting processes and reported to the Board as part of those processes.

Metrics and Targets

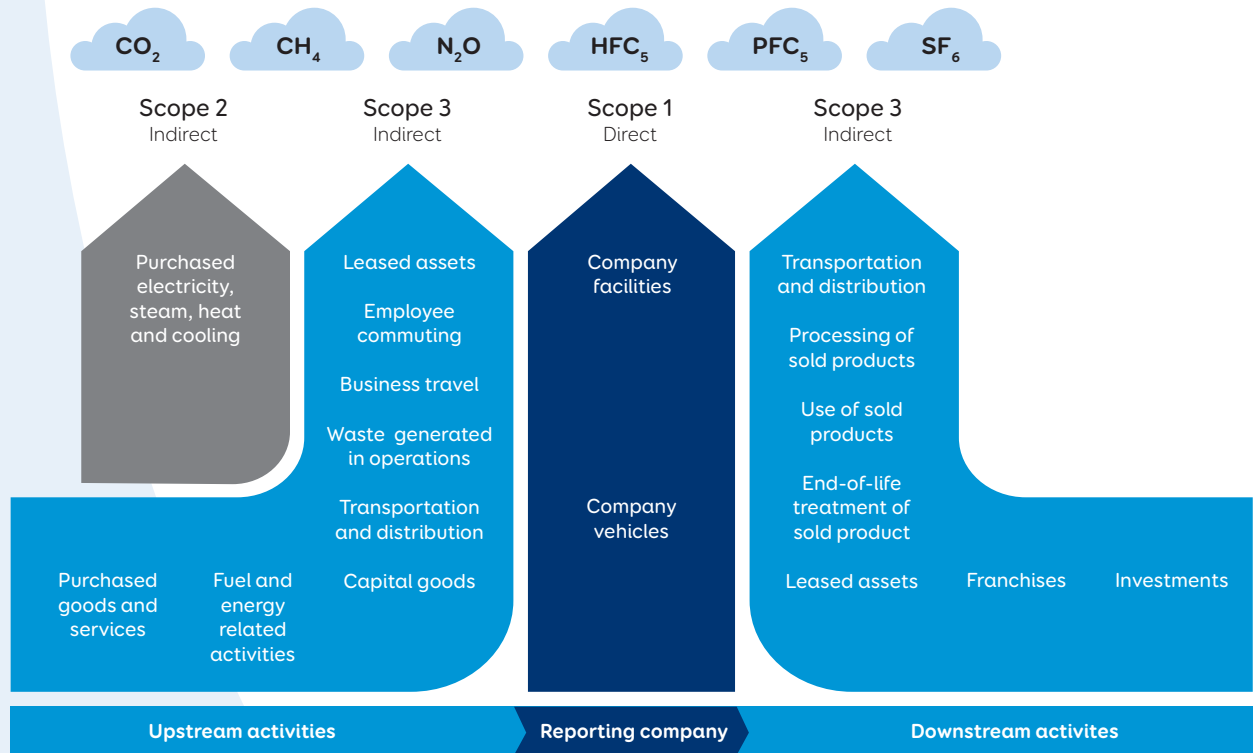
The following section presents LIC’s metrics and targets. No specific industry-based metrics or targets were used in relation to setting GHG targets beyond the use of the New Zealand Government Climate Change Response Act (2002), 2030 methane reduction target. All other metrics and targets were set following the identified metrics in Table 9 below.

LIC uses the GHG Protocol’s categorisation of Scopes and Categories (Figure 6) and we measure our Scope 1 and 2 emissions from an operational control approach.

We have measured and reported on LIC’s GHG emissions since setting a baseline of the 2018/19 year and follow the principles of the GHG Protocol Corporate Accounting and Reporting Standard (GHG Protocol) and ISO 14064-1:2018 standards, as well as the Toitū Envirocare carbonreduce Programme Technical Requirements. To ensure we are accurately reporting GHG data we use Toitū Envirocare’s external carbon calculator.

In 2021, LIC set short-term absolute reduction targets of reducing Scope 1 and 2 operational emissions by 46.2% by 2030, and Scope 1 biogenic methane by 10% by 2030, to reduce our GHG emissions and contribute proportionately to the efforts to limit the global average temperature increase to 1.5°C above pre-industrial levels.

Figure 6



LIC considered that its targets would contribute to limiting global warming in that way after choosing science-aligned reduction targets using the SBTi methodology for Scope 1 and 2. However, we aligned our Scope 1 biogenic methane reductions to those of the New Zealand Government, as recorded in section 5Q(1)(b)(i) Climate Change Response Act 2002 (Target for 2050), except using our 2018/19 financial year as our baseline year rather than the calendar year of 2017 used as the baseline in section 5Q.

The reduction targets were developed and approved in May 2021 by the Senior Leadership Team and the Board of Directors. While we have been working hard on reducing emissions (see our progress as set out in table 8 below), the organisation is in the process of reviewing the above targets and the base year calculation to ensure that the metrics are appropriate given the challenges with sufficient novel technology and innovation being available to achieve the targeted emissions reduction, as well as to reflect LIC's unique opportunity to assist the New Zealand dairy sector to reduce methane emissions through genetic improvement (which involves increasing our trial animals and Scope 1 excreta Nitrous Oxide (N₂O) and methane emissions for a period in order to conduct research and development for a greater long-term impact on methane emissions reduction for the New Zealand dairy sector).

Scope 1 & 2 GHG emissions

LIC uses the operational control approach to define emissions from Scope 1 and 2, including transportation, stationary combustion, agricultural emissions, onsite wastewater treatment, and energy. LIC has used an absolute approach over intensity-based emissions.

GHG emissions detail - table 7

Category and Source	2023/24 - tCO ₂ -e
SCOPE 1	
Diesel	2,327.9
Diesel stationary combustion	2.6
LPG stationary (commercial)	93.6
Natural Gas (commercial)	92.1
Petrol premium	2.7
Petrol regular	337.7
Crop N ₂ O	89.4
Effluent N ₂ O	1.2
Excreta N ₂ O	696.4
Fertiliser - dissolution	59.6
Fertiliser N ₂ O	105.2
Indirect N ₂ O emissions	135.9
Total Scope 1	3,944.3
SCOPE 1 - BIOGENIC METHANE	
Effluent Methane	63.8
Enteric fermentation Methane	3,219.1
Excreta methane	30.4
Wastewater for treatment plant (WWTP)	1.0
Total Scope 1 - biogenic methane	3,314.3
SCOPE 2	
Electricity	218.3
Total Scope 2	218.3
Total Scope 1 & 2 emissions - tCO₂-e	7,476.9

Emission exclusions

Our focus has been on accurately reporting the emissions directly associated with our operations and activities, as well as those emissions that occur upstream and downstream of our value chain where we have significant influence. As a result, LIC has adopted the exemption provision in relation to Scope 3 emissions calculated to ensure we can fully report our Scope 3 emissions once we have materially established our full value chain.

Scope 1 and 2 emission exclusions are detailed below:

GHG emissions source or sink	GHG emissions category	Reason for exclusion
Refrigeration Gases	Scope 1: Direct emissions	LIC used the Ministry for the Environment screening method to calculate an estimate and determined that R-gases are below the <i>de minimis</i> threshold under Ministry for the Environment guidance material ⁷ . LIC will include in future if actual data becomes available.
Liquid nitrogen (LN₂)	Scope 1: Direct emissions	LIC excluded LN ₂ emissions as previously there has not been an emission factor for this source in Toitū's 'emanage' and the New Zealand Ministry for the Environment guidance does not have an emission factor for LN ₂ . We will include LN ₂ in future as part of reviewing our base year and targets.
LPG gas BBQ bottles	Scope 1: Direct emissions	LIC has a few 9kg LPG BBQ cylinders on site. These are excluded from the inventory as they are below the <i>de minimis</i> threshold under Ministry for the Environment guidance material ⁷ .
LIC international subsidiaries - all emissions	All categories	LIC excluded international site data from the GHG inventory report as emissions data is not readily available. LIC will continue to conduct significance screening and attempt to source data for any material source of emissions.

⁷Measuring emissions: A guide for organisations: 2024 detailed guide | Ministry for the Environment

Overall performance against GHG emissions reduction targets

In the 2023/24 reporting year, LIC has reduced our Scope 1 emissions (excluding biogenic methane) by 12.4% against our 2018/19 base year. This reduction is less than our projected 21% reduction required for the 2023/24 reporting year to meet our 2030 target of 46.2% Scope 1 reduction.

Our Scope 2 emissions reduced by 42.1% from our 2018/19 base year. This reduction exceeds our projected 21% reduction required to meet our 2030 target of 46.2% Scope 2 reduction. This reduction primarily results from an emissions factor change since the base year.

Our Scope 1 biogenic methane emissions increased by 2.6% against the 2018/19 base year. Our projected 2023/24 reduction target of 4.6% was not met, however this is primarily due to an increase in trial animals for climate-related initiatives, including breeding for reduced methane in the national dairy herd.

GHG emissions performance against target - table 8

GHG EMISSIONS	Scope 1 -	Scope 2 -	Scope 1 -
	Direct emissions	Indirect emissions	Biogenic methane Direct emissions*
Baseline period	2018/19 season	2018/19 season	2018/19 season
Target date	2030	2030	2030
Type of target	Absolute	Absolute	Absolute
Current performance (tCO₂e)	3,944.3	218.3	3,314.3
Current performance (%)	-12.4%	-42.1%	2.6%
Expected reduction target for 2023/24 (%)	-21.0%	-21.0%	-4.6
Reduction target 2023/24 (tCO₂e)	3,517.1	297.9	3,084.3

*Increase in biogenic methane is primarily due to an increase in trial animals compared to the base year

LIC's Scope 1 emissions are largely derived from transportation fuel from the company's fleet (69%) and on-farm agricultural emissions (20%). Much work has been done to reduce transport emissions by continuing to electrify our fleet. The acquisition of Tauwhare Farm in 2019 has meant we have increased our fertiliser use since the base year, however, ongoing fertiliser management routines have seen a decrease in emissions since the 2020/21 reporting year in 2023/24.

Scope 1 - biogenic methane emissions are attributed to agricultural emissions (almost 100%) as wastewater treatment biogenic methane emissions are minimal. The reduction of animals on our dairy farm has seen that source of emissions decrease, however, we have continued to increase the number of animals in our research trials from our base year with the target of reducing overall methane emissions from the national herd.

The 2018/19 Scope 1 - Direct emissions base year has been recalculated to include Crop N₂O 50.3 tCO₂-emissions to ensure comparability with the current year. Crop N₂O is not a material emissions source but is higher than the *de minimis* threshold under Ministry for the Environment guidance material⁷.

Refer to the appendix for further information on LIC's GHG emissions methods, assumptions and estimation uncertainty.

⁷Measuring emissions: A guide for organisations: 2024 detailed guide | Ministry for the Environment

Other Climate-related metrics - table 9

Required metrics	2023/24 Metrics	Target	Comments
GHG emissions intensity	28.0 tonnes of Scope 1 & 2 CO ₂ emissions per NZD million revenue	N/A	Revenue is considered to be the most appropriate intensity metric for LIC
\$ or % of assets/ business activity vulnerable to <u>transition risks</u>	30% of business activity due to smaller dairy herd risk	N/A	Based on potential outcomes described in Aotearoa Circle Orderly Transition scenario, which was underpinned by modelling by the Climate Change Commission
\$ or % of assets/ business activity vulnerable to <u>physical risks</u>	46% of business activity	N/A	Based on the proportion of 2023/24 revenue representing business activity that could be impacted by LIC not being able to access farms on a timely basis to perform services
\$ or % of assets/ business activity aligned with <u>climate-related opportunities</u>	31% of business activity	N/A	Based on the proportion of 2023/24 revenue that is considered to be linked to climate-related opportunities
\$ Capital funding climate-related risks/ opportunities	\$0.9 million	N/A	Capitalised spend during the reporting period on climate-related risks/opportunities
Internal emissions price	\$80.64 per 1 tonne CO ₂ -e (or CH ₄ for Biogenic Methane converted to CO ₂ -e)	N/A	This was set for the year ended 31 May 2024 based on 2023 ETS Trigger Pricing for the release of reserve units under the Climate Change (Auctions, Limits and Price Controls for Units) Regulations 2020 (in force as at 1 January 2023) and will be updated annually. The internal emissions price is only required to be used if there is expected to be more than 10 tonne CO ₂ -e annual impact.
Management remuneration linked to climate-related risks/ opportunities	Not specifically linked, strategic initiatives include climate-related risks/opportunities, achievement of which are part of management objectives	N/A	N/A

Required metrics	2023/24 Metrics	Target	Comments
Industry/other metrics			
Bull team genetic gain - LIC metric	34%	31.7%	3-year rolling average rate of increase in the genomic Breeding Worth ⁸ (gBW) of the Premier Sires bull teams to exceed the 10 year historical average rate of increase by 20%
% change in cows - Industry metric	3.46% decrease to 4.67 million cows (2022/23 vs 2021/22)	N/A	Source: New Zealand Dairy Statistics 2022-23
Milk production efficiency - rolling three-year average kilogram milk solids per cow - Industry metric	1.3% increase to 394.5 per cow from 389.4 (three-year rolling average to 2022/23)	N/A	Source: New Zealand Dairy Statistics 2022-23

⁸Genomic records, ancestry information and technology allow us to accurately identify elite bulls at a young age by way of a calculated genomic Breeding Worth so we can start using those animals to breed the next generation of cows sooner. The use of genomics in our breeding programme means we can reduce the generation interval from five years to two.

Appendix

GHG emissions methods, assumptions and estimation uncertainty

LIC uses an operational control consolidation approach to account for emissions. Organisational boundaries were set with reference to the methodology described in the GHG Protocol and ISO 14064-1:2018 standards. The GHG protocol allows two distinct approaches to consolidate GHG emissions: equity share or control approaches (financial or operations). LIC has opted to disclose our GHG emissions using the operational control consolidation approach for our New Zealand operations for Scopes 1 and 2 of our GHG inventory. The operational control consolidation approach was chosen as LIC recognises that all our operations may have a direct impact on the environment. LIC has excluded the following business entities from our GHG inventory:

- Ireland
- Australia
- UK

A calculation methodology has been used for quantifying the emissions inventory based on the following calculation approach unless otherwise stated below:

Emissions = activity data x emissions factor

All emissions were calculated using Toitū emanage with emissions factors and Global Warming Potentials provided by the Toitū carbonreduce programme. Global Warming Potentials (GWP) from the IPCC fifth assessment report (AR5)⁹ are the preferred GWP conversion.

LIC has systems and procedures in place that will ensure applied quantification methodologies will continue in future GHG emissions inventories, or that material changes will be managed and disclosed..

GHG emissions Scope	GHG emissions source or sink subcategory	Overview of activity data and evidence	Explanation of uncertainties or assumptions around your data and evidence	Use of default and average emissions factors	Pre-verified data
Scope 1: Direct emissions and removals	Stationary combustion	LPG stationary commercial, Natural Gas distributed commercial, Diesel stationary combustion	Missing some data occasionally from unavailable emails/invoices misfiled. When that has occurred data average for the period is used for that month. Estimates of diesel fuel in the generators. No reporting on top-ups. Litres used are determined by generator size.	Some missing data where a monthly average was required to be used. We have projects currently in progress to eliminate the need to manually extract data from invoices.	Not applicable.

⁹www.ipcc.ch/assessment-report/ar5/

GHG emissions Scope	GHG emissions source or sink subcategory	Overview of activity data and evidence	Explanation of uncertainties or assumptions around your data and evidence	Use of default and average emissions factors	Pre-verified data
Scope 1: Direct emissions and removals	Mobile combustion (incl. company-owned or leased vehicles)	Diesel, Petrol premium, Petrol regular	Rely on Levno, Lease Plan, and Toyota data. LIC's policy is that fuel cards can only be used to purchase fuel, (unless a remote location without our preferred provider) and as such we have good reporting on fuel litres purchased.	Averages were not used for this data set. It is complete.	LIC did not get the data pre-verified as we extracted the data ourselves using pivot tables to ensure we had split the different fuel types out to ensure the most accurate emission factors were used.
Scope 1: Direct emissions and removals	Leakage of refrigerants	Wastewater for treatment plants (average)	Assume that water samples taken monthly are accurate and that the water meters are functioning correctly. The system is maintained regularly.	Averages were not used for this data set. It is complete.	N/A
Scope 1: Direct emissions and removals	Fertiliser use	Fertiliser dissolution, and fertiliser N ₂ O	Farm data is determined using stocking rates, fertiliser applications, feed etc. Ravensdown enters data into Overseer. Human error when transferring data can lead to miscalculations. Use peer review.	Averages were not used for this data set. It is complete.	Data is published from OverseerFM into Toitū my farms and then downloaded and entered into the emanage software as precalculated emissions. Emissions from animals not in OverseerFM are determined by an LIC scientist using the correct methodology (from IPCC fourth assessment report AR4 ¹⁰).

¹⁰www.ipcc.ch/assessment-report/ar4/

GHG emissions Scope	GHG emissions source or sink subcategory	Overview of activity data and evidence	Explanation of uncertainties or assumptions around your data and evidence	Use of default and average emissions factors	Pre-verified data
Scope 1 - Direct emissions and removals	Addition of livestock waste to soils	Effluent N ₂ O, excreta N ₂ O, Crop N ₂ O, and indirect N ₂ O emissions	Farm data is determined using stocking rates, fertiliser applications, feed etc. Ravensdown enters data into Overseer. Human error when transferring data can lead to miscalculations. Use peer review.	Averages were not used for this data set. It is complete.	Data is published from OverseerFM into Toitū my farms and then downloaded and entered into the emanage software as precalculated emissions. Emissions from animals not in OverseerFM are determined by an LIC scientist using the correct methodology (from IPCC fourth assessment report AR4 ¹⁰).
Scope 1 - biogenic methane: Direct emissions and removals	Enteric fermentation	Enteric fermentation methane	Farm data is determined using stocking rates, fertiliser applications, feed etc. Ravensdown enters data into Overseer. Human error when transferring data can lead to miscalculations. Use peer review.	Averages were not used for this data set. It is complete.	Data is published from OverseerFM into Toitū my farms and then downloaded and entered into the emanage software as precalculated emissions. Emissions from animals not in OverseerFM are determined by an LIC scientist using the correct methodology (from IPCC fourth assessment report AR4 ¹⁰).
Scope 1 - biogenic methane: Direct emissions and removals	Addition of livestock waste to soils	Effluent methane and excreta methane	Farm data is determined using stocking rates, fertiliser applications, feed etc. Ravensdown enters data into Overseer. Human error when transferring data can lead to miscalculations. Use peer review.	Averages were not used for this data set. It is complete.	Data is published from OverseerFM into Toitū my farms and then downloaded and entered into the emanage software as precalculated emissions. Emissions from animals not in OverseerFM are determined by an LIC Scientist using the correct methodology (from IPCC fourth assessment report AR4 ¹⁰).
Overall assessment of uncertainty for Scope 1 emissions and removals			10% - Medium		

GHG emissions Scope	GHG emissions source or sink subcategory	Overview of activity data and evidence	Explanation of uncertainties or assumptions around your data and evidence	Use of default and average emissions factors	Pre-verified data
Scope 2: Indirect emissions from imported energy	Imported electricity	Electricity	<p>Assume that supplier invoices and provided spreadsheets are correct.</p> <p>Calculated using the location-based method. "The market-based method is not materially different: 219.2 tCO₂ emissions (vs 218.3)."</p>	Averages were not used for this data set. It is complete.	N/A
Overall assessment of uncertainty for Scope 2 emissions and removals			2% - Low		

605 Ruakura Road
Newstead 3286
Hamilton
New Zealand

07 856 0700 | lic.co.nz

