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Climate Change Report

– New Zealand Superannuation Fund

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Overview



Sustainable
investment
delivering
strong returns
for all New
Zealanders

*Kia toitū te
haumi hei hua
mā ngā
tangata katoa
o Aotearoa*

FOREWORD

The Guardians of New Zealand Superannuation ('Guardians') has a long-standing commitment to sustainable investment, informed by our mandate, purpose and investment beliefs.

The Board recognises that best practice includes navigating the transition to a more sustainable financial system, as reflected in our Purpose: *'Sustainable investment delivering strong returns for all New Zealanders'*.

Our Guardians of the Future strategy establishes key principles and focus areas to guide pursuit of that purpose through our culture, systems, people and decision making. The strategy acknowledges climate change as a major source of future uncertainty - along with the need for an adaptive approach to managing broader systemic risks and opportunities.

The Guardians' Sustainable Finance Goal is to *'incorporate sustainability considerations into investment decision-making and support the development of a sustainable financial system'*. This means we seek to:

- incorporate environmental, social and governance (ESG) factors into investment decisions with the intention of advancing sustainability, while fulfilling our financial purpose;
- consider the impact of ESG on our investments, and the impact of our investments on society and the environment, and;
- work with others to overcome barriers to a more sustainable financial system.

This Goal reflects one of our key investment beliefs - that ESG considerations, including climate change, are fundamental to long-term financial risk and return. Sustainability considerations are integrated across our portfolio management activities, including how we allocate risk budgets; analyse, define and diligence new opportunities, and; through our active ownership. This includes collaborating with our external investment managers, exercising our voting rights, and engaging with investee companies to improve their own policies and practices.

We have published annual climate-related disclosures since 2017, reflecting the recommendations of the Taskforce on Climate-related Financial Disclosures. Since 2024, our disclosures have been made in alignment with the Aotearoa New Zealand Climate Standards issued by the External Reporting Board.

As global good practice, standards, and data evolves, we are committed to refining our approach to climate-related strategy, analysis and reporting. As such, in April 2025 the Board approved the setting of new greenhouse gas emissions reduction targets for 2030, alongside a revised method for measuring portfolio emissions.



A handwritten signature in black ink that reads 'Jo Townsend'.

JO TOWNSEND
CHIEF EXECUTIVE OFFICER

DISCLOSURE STATEMENT

The disclosures in this Climate Change Report are made in alignment with the Aotearoa New Zealand Climate Standards (the 'Standards') issued by the External Reporting Board (XRB), and in respect of the New Zealand Superannuation Fund (the 'Fund').¹

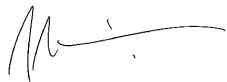
The Guardians of New Zealand Superannuation ('Guardians') is not a climate-reporting entity under the Financial Markets Conduct Act 2013. Nonetheless, we have adopted the Standards as the basis for our climate-related disclosures, due to our commitment to transparency, best practice, and application of the Crown Responsible Investment Framework (December 2021).²

In preparing this report, the Guardians has elected to rely - in full, or in part - on some of the adoption provisions in the Standards (see 'Overview of Disclosures').³

The report contains some disclosures that may rely on incomplete or estimated data, partial or provisional assessments of current and forward-looking information, and related judgements, opinions and assumptions.

The preparation of the Climate Change Report requires the Board and management to make judgements and use estimates that affect the reported risks, opportunities, metrics, and accompanying disclosures. Uncertainty about these judgements and estimates could result in outcomes that require a material adjustment to climate-related disclosures in future periods. The judgements and estimates used in respect of the Fund are believed to be reasonable under the current circumstances, and are re-evaluated on an annual basis. They are based on a range of factors, including projections of plausible but uncertain futures that may impact on the Fund. The judgements and estimates that the Board and management consider the most significant are: Climate change scenarios (Section 4.3.a); Greenhouse gas emissions of our investment portfolio (Section 5.1), and; Climate value-at-risk (Section 5.2).

For and on behalf of the Guardians Board, who authorised the issue of this Climate Change Report on **24 September 2025**:



JOHN WILLIAMSON,
Chair - Guardians Board
24 September 2025



HINERANGI RAUMATI-TU'UA, MNZM
Chair - Audit & Risk Committee
24 September 2025

1. Aotearoa New Zealand Climate Standards, effective 1 January 2023 (<http://www.xrb.govt.nz/>), amended Nov 2024.

2. <https://nzsuperfund.nz/assets/Uploads/Enduring-Letter-of-Expectations-to-Crown-Financial-Institutions-in-relation-to-Responsible-Investment.pdf>

3. Adoption of Aotearoa New Zealand Climate Standards (<https://standards.xrb.govt.nz/standards-navigator/nz-cs-2/>)

OVERVIEW OF DISCLOSURES

NZ Climate Standards reference [standard / paragraph]	NZ Super Fund Report reference (section / page)
2. GOVERNANCE: Respective roles of governance body and management in overseeing, assessing, and/or managing climate-related risks and opportunities [CS1-6] – p10; Figure 2	
Governance body responsible for oversight of climate-related risks and opportunities [CS1.7-8]	2. Governance (p10; Figure 2)
Management role in assessing and managing climate-related risks and opportunities [CS1.7; CS1.9]	2. Governance (p10; Figure 2) 3. Risk Management (p13)
3. RISK MANAGEMENT: How climate-related risks are managed and integrated as part of Guardians' wider risk management processes [CS1.17] - p13; Figure 3	
Processes for identifying and assessing climate-related risks [CS1.18a; CS1.19]	3.2 Climate-related enterprise risk management (p13; Figure 3) 4.3 Climate Change Investment Strategy (CCIS), (a) Analyse, <i>Climate-related investment risk analysis</i> (p17)
Integration of climate-related risk management into overall risk management system [CS1.18b]	3.2 Climate-related enterprise risk management (p13; Figure 3)
4. STRATEGY: How climate-related scenarios, risks, opportunities and impacts are identified and assessed; approach to climate transition [CS1.11] – p16; Figure 4	
Current physical and transition impacts, including material financial impacts [CS1.12]	4.3 CCIS, (a) Analyse, <i>Climate-related investment impacts</i> (p20; Figure 4; Figure 6; Box 1)
Climate scenario analysis undertaken [CS1.13; CS3.51]	4.3 CCIS, (a) Analyse, Climate Scenario Analysis (p17; Table 1; Figure 5)
Climate-related risks, opportunities [CS1.14]	4.3 CCIS, (a) Analyse, Climate-related investment risk analysis (p17)
Anticipated physical and transition impacts, inc. material financial impacts [CS1.15]	4.3 CCIS, (a) Analyse, Climate-related investment impacts (p20; Figure 6)
<i>Adoption Provision 2 - Anticipated Financial Impacts [CS2.12]: Partially applied</i>	Box 1 (p20)
Transition plan aspects of strategy [CS1.16]	4.3 CCIS (d) Search (p24; Figure 4) 4.4. Climate Action Plan (p26-27; Figure 7)
5. METRICS AND TARGETS: Targets and measures established in relation to climate-related risks and opportunities [CS1.21] - p28	
Metrics used to assess climate-related risks and opportunities [CS1.21; CS3.40-43]	5.1 GHG emissions (p28; Tables 2-8); Annex A; Annex B 5.2 Climate Value-at-Risk (p35; Table 9) 5.3 Carbon Price (p36)
<i>Adoption Provision 4 - Scope 3 GHG emissions [CS2.17]: Partially applied</i>	5.1 GHG emissions (p28; Box 2 p29)
<i>Adoption Provision 5 - Comparatives for Scope 3 GHG emissions [CS2.18-19]: Partially applied</i>	5.1 GHG emissions (p28; Box 2 p29)

NZ Climate Standards reference [standard / paragraph]	NZ Super Fund Report reference (section / page)
Targets used to manage climate-related risks and opportunities [CS1.23]; Performance against targets [CS1.23d]	5.1a GHG emissions (p29-30; Table 2; Figure 8) 5.1b GHG emissions (p32)
Greenhouse gas (GHG) emissions [CS1.22a-b; CS1.24; CS3.52-54]	5.1a GHG emissions – current method (p29; Table 2; Figure 8; Annex A) 5.1b GHG emissions – revised method (p32; Table 3-8; Annex B)
<i>Adoption Provision 6 - Comparatives for Metrics [CS2.20]: N/A</i>	Box 3 (p36)
<i>Adoption Provision 7 - Analysis of trends [CS2.22]: Partially applied</i>	Box 3 (p36)
<i>Adoption Provision 8: Scope 3 GHG emissions assurance [CS2.24]: Not applied</i>	5.1 GHG emissions (p28; Box 2) Independent Assurance Report (see website)

1.

Introduction



This report serves the dual purpose of addressing the Standards, whilst also summarising the Guardians' broader strategic approach, processes and practical actions around climate change

INTRODUCTION

1.1 WHO WE ARE

The New Zealand Superannuation Fund (the 'Fund') exists to help pre-fund the increasing cost of government-provided superannuation due to New Zealand's ageing population, driven through our Purpose: *'Sustainable investment delivering strong returns for all New Zealanders'*.

The Fund is a growth-oriented investment portfolio, holding a mix of public and private assets from New Zealand and around the world (Figures 1a and 1b).

Our governing legislation, the New Zealand Superannuation and Retirement Income Act 2001, requires the Guardians of New Zealand Superannuation (the 'Guardians') to invest the Fund on a prudent, commercial basis and, in doing so, to manage and administer the Fund in a manner consistent with:

- a) best practice portfolio management;
- b) maximising returns without undue risk to the Fund as a whole; and
- c) avoiding prejudice to New Zealand's reputation as a responsible member of the world community.

Figure 1a: Where the Fund is invested (as of 30 June 2025)

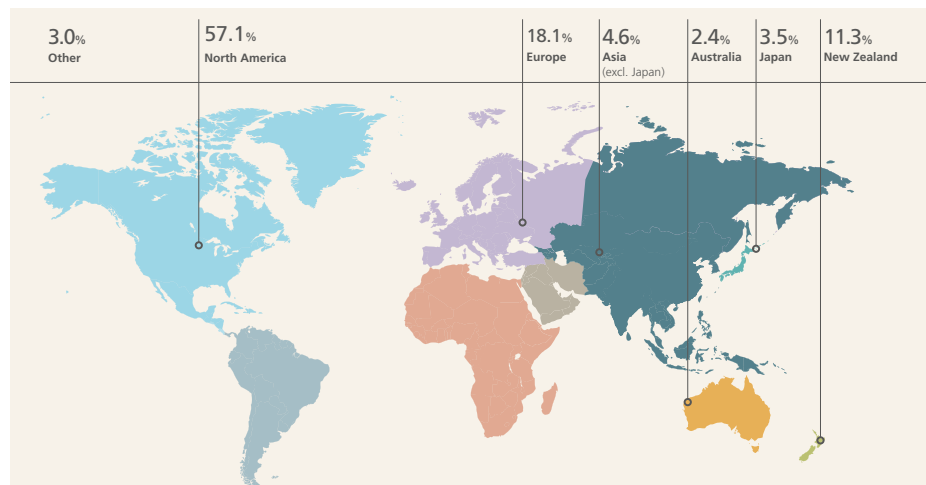
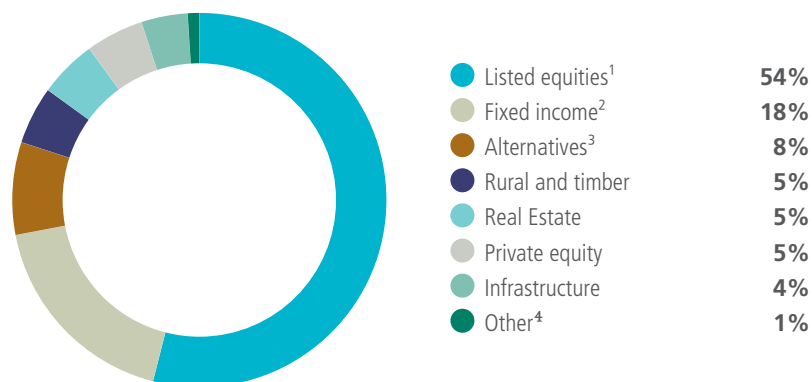


Figure 1b: Asset allocation breakdown (as of 30 June 2025)



1. NZ 4%, other developed markets 47%, emerging markets 3%
2. Corporate debt securities 3%, Treasuries 10%, Other 5%
3. Hedge funds and other liquid alternatives
4. Cash, cash equivalents, and miscellaneous

1.2 ABOUT THIS REPORT

The Guardians is not a climate-reporting entity under the Financial Markets Conduct Act 2013. Nonetheless, we have referenced the Standards as the basis for our climate-related disclosures, due to our commitment to transparency, best practice, and the Crown Responsible Investment Framework.

This Climate Change Report serves the dual purpose of addressing the Standards, whilst also summarising the Guardians' broader strategic approach, processes and practical actions around climate change. We have applied some of the Standards' adoption provisions to reflect limitations in data quality and evolving good practice in the domain of climate-related analysis, planning and reporting.

This report sets out how we address climate change considerations across each of the four thematic areas of the Standards (governance, risk management, strategy, metrics and targets). A glossary of key terms, statement of limitations, assumptions and estimation uncertainties, and basis of preparation (Annex A; Annex B) are included to clarify more technical aspects.

The Guardians' financed (Scope 3; Category 15) greenhouse gas (GHG) emissions - representing the transition risk exposure of the underlying securities and investee companies in the Fund - are the most material aspect of climate-related risk from across our value chain. Accordingly, the primary focus of this report is our financed emissions and related climate risks.

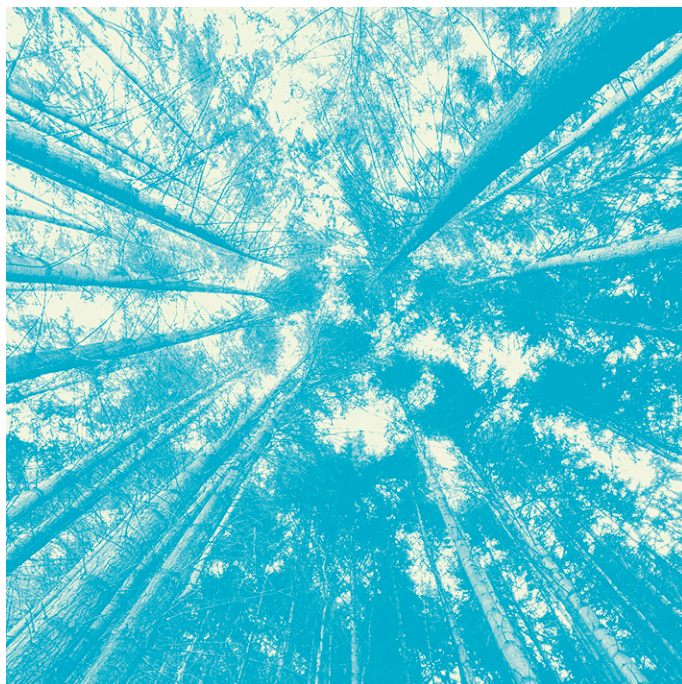
Gross emissions arising from the Guardians' operations (including investment management, administration and other services) are considered immaterial (<0.1%) relative to our financed emissions and are not addressed in this Climate Change Report.

Whilst the Guardians also provides governance oversight of the Elevate fund, this is directly managed by a separate Crown entity and does not form part of these disclosures.

Further information on the Fund, the Guardians' broader investment approach and Sustainable Finance Strategy can be found in our Annual Report and on our website.

2.

Governance



The Guardians' Board has overall responsibility for climate-related aspects of the Fund's investment strategies, risks, and reporting

GOVERNANCE

The Board has overall responsibility for climate-related aspects of the Guardians' operations, investment strategies, risks, and reporting - with management of these delegated to specific subcommittees and/or senior leadership. This includes: approving our investment beliefs – such as that environmental, social and governance (ESG) considerations are fundamental to long-term risk and return; setting the Fund's investment risk appetite; and driving climate change objectives by including them in our Statement of Investment Policies, Standards and Procedures (SIPSP).

The Guardians' governance of climate-related reporting (Figure 2) is aligned with existing processes applied to our financial reporting, where applicable. The Audit & Risk Committee terms of reference explicitly refer to '*...assisting the Board with oversight of the Guardians' climate-related disclosures (CRD)*', with specific responsibilities for the Committee to:

- oversee the integrity of the Guardians' CRD, including compliance with applicable reporting standards.
- review the annual CRD and any supporting information.
- review the systems of internal control and satisfy itself that the Guardians CRD is supported by appropriate management sign-off on the adequacy of those systems.
- review the scope of arrangement and terms of engagement of the assurance provider for aspects of CRD subject to external assurance.
- review any CRD-related external assurance reports (where applicable).

CRD has been a key focus for the Audit & Risk Committee in 2024/25. The Committee participated in periodic discussion and education sessions on climate change and reporting regimes in New Zealand and overseas to ensure members understood the evolving requirements, and how the management team were addressing them.

Our CEO is responsible for executing the Guardians' overall strategy and implementing our SIPSP, Statement of Intent, annual Strategic Plan, and delivery of our strategic objectives. Our wider leadership team plays an active role in promoting a focus on climate change across the New Zealand and global finance sector.

In 2024-25, the Board and CEO adopted the 'Guardians of the Future' as our organisational strategy, including reference to climate change as a consideration in strengthening our investment approach, optimising our organisation, and enhancing our external presence.

Our Co-Chief Investment Officers (Co-CIO), Investment Heads and internal committees have designated roles in ensuring that our policies, investment strategies and processes remain appropriate and effective, as they relate to climate change considerations. This includes Co-CIO and Investment Committee oversight of the implementation of our Board-approved Climate Change Investment Strategy (CCIS).

The Co-CIOs, Investment Committee and/or delegates are responsible for overseeing investment risks and opportunities – including material climate-related aspects. Progress regarding CCIS implementation, targets, and addressing climate-related issues is reported to the Investment Committee and the Board in the form of an annual Sustainable Finance Report.

Members of our Investment Team, including sustainable investment subject-matter experts, are responsible for addressing climate-related risks and opportunities, and integrating key considerations into the Guardians' investment due diligence, investment strategies and portfolio management processes.

We aim to give all Guardians the knowledge and tools they need to address climate-related issues relevant to their role, incorporating key aspects of our approach in the staff induction process. Our onboarding, Investment Forums and education sessions for the Board, executive leadership and team members on climate change, reporting and assurance help to develop appropriate competencies as our approaches evolve. These internal initiatives are supplemented with external sustainable finance training and certification for an increasing number of the Guardians team.

Our Statement of Intent sets out the key performance indicators determined by the Guardians' Board, while the Statement of Performance Expectations includes near-term expectations about progress against strategic priorities. Key aspects of these statements may be rolled into individual objectives for relevant members of the senior team.

We do not currently link staff performance objectives or incentives to outcome-related climate targets. However, where teams or individuals have been set specific process-related objectives relevant to the CCIS, performance against those objectives is linked to a discretionary portion of remuneration.

FOUNDATIONS OF OUR SUSTAINABLE INVESTMENT APPROACH

STATUTORY INVESTMENT MANDATE

Invest the Fund on a prudent, commercial basis in a manner consistent with:

- Best practice portfolio management
- Maximising returns without undue risk to the Fund as a whole, and;
- Avoiding prejudice to NZ's reputation as a responsible member of the world community.

BOARD-APPROVED POLICY, STRATEGY AND TARGETS

Purpose: Sustainable investment delivering strong returns for all New Zealanders

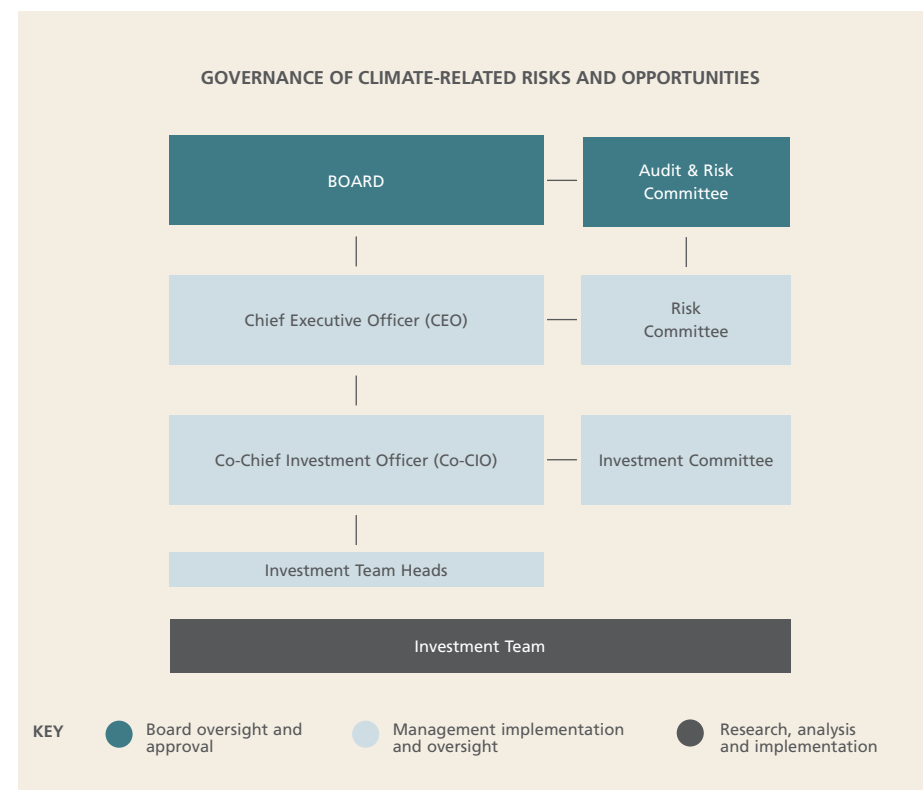
Policies: Statement of Investment Policies, Standards and Procedures; Sustainable Investment Policy and Framework.

Strategy: Guardians of the Future; Sustainable Finance Goal / Strategy; Climate Change Investment Strategy.

Practice:

- Sustainable Finance Roadmap (2022-)
- Emissions reduction targets: 2020; 2025 (current); 2030 (new)
- Reference Portfolio shifted to Climate Paris-aligned Benchmark

Figure 2: Policy, governance and strategy around the Guardians' climate-related risks, opportunities and reporting



3.

Risk Management



The Sustainable Investment Framework guides us in navigating the transition to a more sustainable financial system - including managing climate-related risks and opportunities

3.1. OVERVIEW OF RISK MANAGEMENT APPROACH

Our Board has established it is willing to take risks to achieve the Guardians' Mandate, Purpose and Vision, commensurate with the return objective and time horizon of the Fund. The Board expects the Guardians to use all reasonable measures - without imposing excessive costs or constraints - for managing across four categories of risk: Culture, Governance, People, Processes.

Our Annual Report describes the Guardians' risk appetite, culture, and general approach to risk assessment and management. Our Risk Management Framework states that accountability for investment and enterprise risk identification and mitigation sits across all parts of our team.

Investment risk is managed by the adoption of the Reference Portfolio, approved investment constraints, and the SIPSP. The SIPSP, Investment Risk Allocation Policy and Risk Management Policy and Procedures are reviewed annually by management, and at least every five years by the Board. The Board and leadership of the Guardians are responsible for the oversight of key risks, supported by a Risk Committee and Investment Committee.

The Board receives periodic Enterprise Risk reports, reflecting the strategic and emerging risks identified by the Guardians' business units and Leadership Team. Each business unit conducts annual Business Environment Scans and Risk Register Reviews that identify the risks, controls and action plans relevant to its specific objectives and activities.

The Risk Committee oversees identification and management of existing, evolving or emerging risks, determining which should be escalated. The Leadership Team and Board review the top risks and evaluate the effectiveness of our risk management plans and if any further action is needed.

3.2. CLIMATE-RELATED ENTERPRISE RISK MANAGEMENT

The Guardians prioritise climate change as a Strategic Risk. In 2023, we conducted a Risk Control Effectiveness Assessment, determining that the nature of climate-related enterprise risk could be more accurately defined as: *'the Guardians does not effectively manage the climate-related risks'* over which we have agency.

The assessment considered risk drivers, impacts and transmission pathways – especially in terms of how climate-related investment risks may translate into enterprise risk. The following six climate-related risks were determined to have the potential to lead to impacts on our portfolio and/or organisation:

- Potential investment underperformance due to miscalculated climate risk, along with concerns related to reporting.
- Market volatility affecting public or private climate-related commitments and/or investments in vital climate change mitigation and adaptation initiatives.
- Reputational damage if our climate change response actions are perceived as insufficient, excessively ambitious, and/or financially imprudent.
- Legal or quasi-legal actions being taken against the Guardians.
- ‘Greenwashing’, where our climate metrics and/or standards deviate from evolving good practices over time.
- Organisational disruption due to more frequent or severe natural hazards linked to climate change.

Along with the six causes and impacts, the assessment identified 12 core risk controls and several other activities and actions that support the Guardians in managing and monitoring this risk (Figure 3). The findings of the assessment demonstrated that our SIPSP, Sustainable Investment Framework and CCIS collectively act as effective risk controls; addressing climate-related enterprise risks and supporting the delivery on our mandate.

The Sustainable Investment Framework and CCIS address investment risks to the portfolio, assist the Guardians to play its role in a shift to a sustainable finance system, and help manage climate-related reputational, legal and regulatory risks. The CCIS is an underpinning strategy in the SI Framework which is contained within the SIPSP.

The SIPSP and SI Framework are approved by the Board and are the main controls for investment-related ESG risks, including climate change. The Board’s approval of the Paris-Aligned Benchmark portion of the Reference Portfolio itself reflects recognition and action on climate change risk and opportunities.

The assessment noted that our investment teams and committees frequently identify areas for further climate research and refinement of systems, processes and tools - emphasising the importance of professional judgment often required when assessing this complex area of risk. It determined that the current design and operating effectiveness of the control environment we rely on to manage climate risk was adequate for managing the defined risk. Figure 3 is not exhaustive but highlights the primary controls used in managing the Guardians’ climate risk effectively. These are reviewed on an annual basis as part of our CRD process.

3.3 THIRD PARTY RISK

The key third parties linked to the Guardians climate-related disclosures include: the Network for Greening the Financial System (NGFS), MSCI, and external investment managers.

The **NGFS** is the key climate change scenario source for the majority of central banks and financial supervisory agencies in the markets where we invest. Given their transparency and our awareness of the limitations inherent in their approach, we have not prioritised specific third-party risk analysis for NGFS.

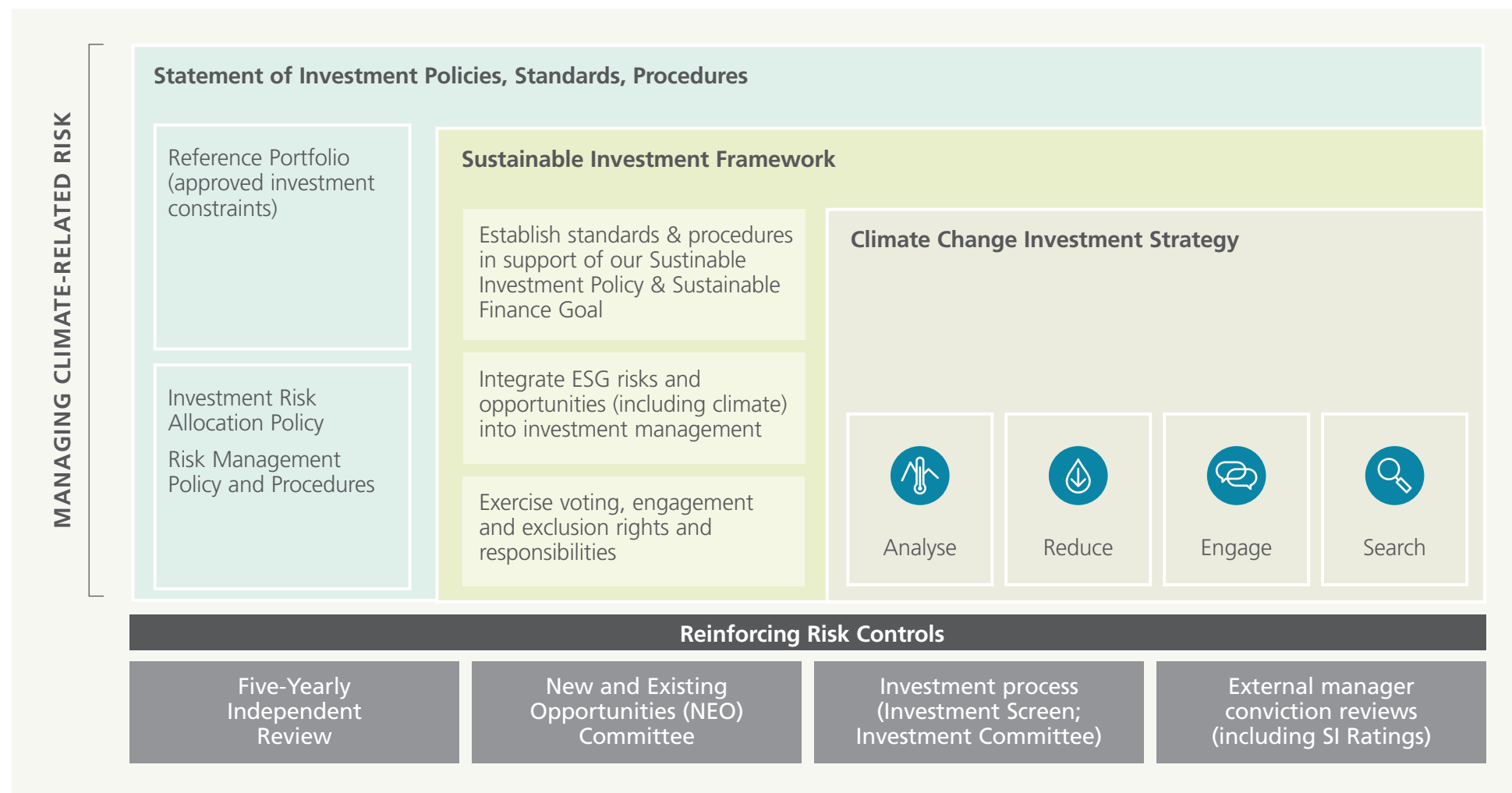
MSCI is our principal ESG data service provider, covering GHG emissions data, climate value-at-risk (CVaR) analysis, and our Paris-aligned benchmark information. Risks regarding the quality and accuracy of third party supplied data are difficult to fully mitigate, with the potential for results to vary from an under- to an over-reporting of climate-related risks. MSCI looks at a broad range of dimensions when assessing the quality of input data used in their ESG and climate models, including completeness, exhaustivity, timeliness, accuracy and traceability back to sources. We rely on the system and organisation controls (SOC) reports by independent external auditors over the design of MSCI controls related to data processing, security, availability and confidentiality. This improves our confidence in the MSCI systems and processes, though we continue to advocate for additional work on their SOC covering operating effectiveness. Section 6, Annex A and Annex B discuss third party data, methods, assumptions and limitations in more detail.

We expect our **external investment managers** to consider relevant climate change risks and impacts when investing on our behalf. Before we invest, we undertake due diligence with managers, communicate our belief about the materiality of climate change, and ask them to integrate consideration of climate change in their investment process, as appropriate. In 2024-25, we applied a rating framework to allow us to more effectively and objectively communicate and monitor the sustainable investment performance of our managers over time. This framework explicitly rates managers’ practices on measuring and improving their climate risk management, performance and disclosure.

3.4 FRAUD RISK

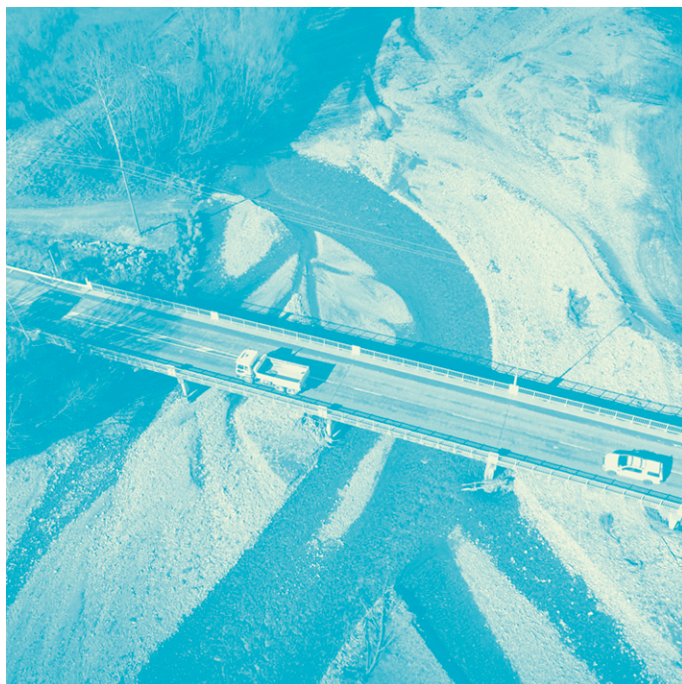
The risk of fraud linked to climate-related disclosures was determined as very low likelihood due to lack of any direct incentive or opportunity by Guardians’ individuals, groups, or suppliers. We will continue to monitor fraud risk as our strategies, practices and targets evolve.

Figure 3: Nested controls for managing climate-related risk



4.

Strategy



Our Climate Change Investment Strategy provides four pillars for addressing the complexities, risks and opportunities related to climate change - supporting our strategic response

4.1. OVERVIEW

We take climate change into account in designing our investment approach. We joined the Carbon Disclosure Project in 2007 and launched our first dedicated Climate Change Investment Strategy (CCIS) in 2016. Our broader Sustainable Finance Goal, established in 2022, sets out the interlinked intentions of:

- incorporating ESG into investment decisions to advance sustainability, whilst fulfilling our financial purpose;
- considering the impact of ESG on our investments, and the impact of our investments on society and the environment, and;
- working with others to overcome barriers to a sustainable financial system.

Our latest Guardians for the Future strategy established key principles and focal areas to guide our organisational culture, systems, thinking and decision-making within the context of an uncertain future. This strategy acknowledges climate change as one source of uncertainty, along with the need for an adaptive approach to managing this, and other systemic risks and opportunities in support of our Purpose.

We continue to explore and progressively integrate sustainability-related considerations into our thinking, operations, systems and processes, as appropriate.

4.2. CLIMATE CHANGE INVESTMENT CASE

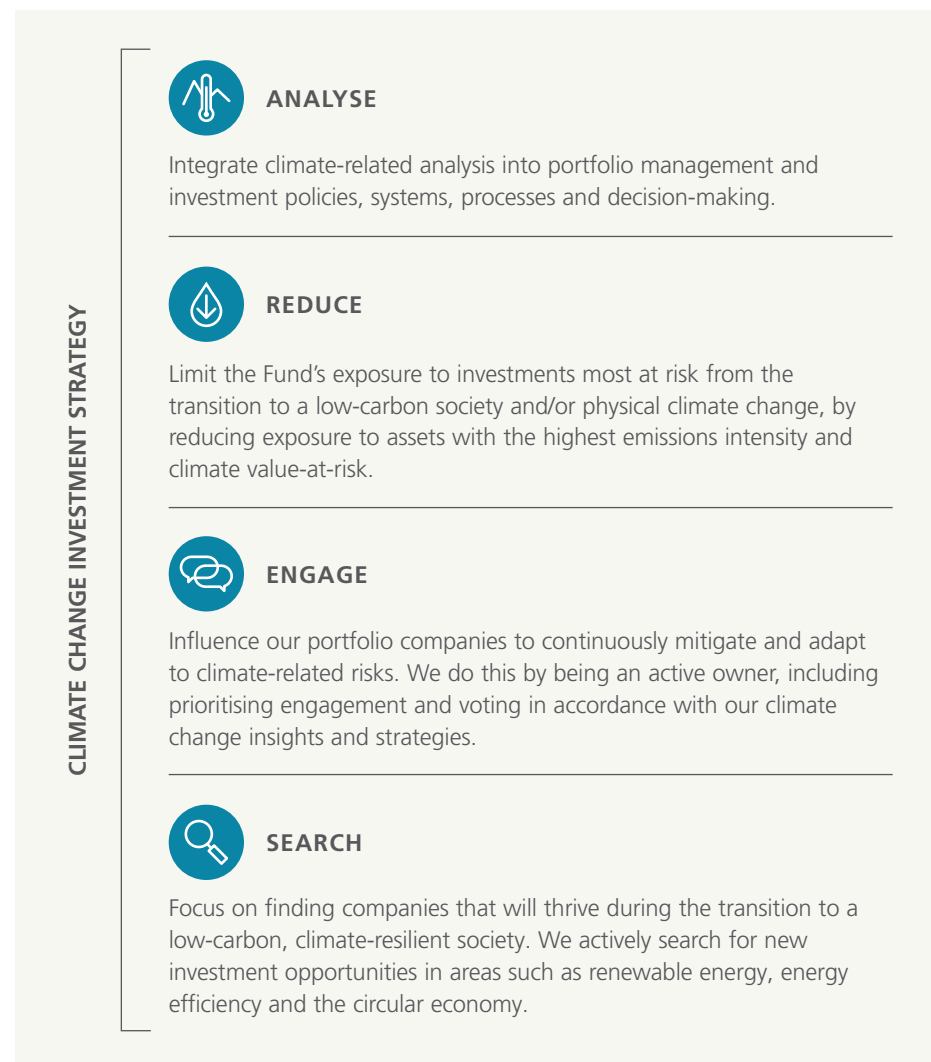
Climate change is an intergenerational and transboundary challenge, necessitating unprecedented levels of constructive coordination across diverse countries and stakeholders. We developed our initial CCIS because we came to the view that climate change also involved substantial market and policy failures and material physical risks - which presented undue risk to returns for the Fund.

Climate change presents both systemic and specific risks for which we are not always rewarded via investment returns. While many climate-related impacts will take time to be revealed, financial markets are forward-looking. Prices may adjust quickly when a greater appreciation of the risks and opportunities from climate change emerges.

As a long-term investor, it is prudent to reduce portfolio exposure to uncompensated risks and seek exposure to opportunities now - rather than trying to anticipate when markets will adjust. As an asset owner with broad market exposure, we recognise the mutual benefits of playing our part to facilitate orderly societal transition and resilience in response to climate change.

4.3. CLIMATE CHANGE INVESTMENT STRATEGY

Figure 4: Overview of the Guardians Climate Change Investment Strategy



Our CCIS sets out a framework for understanding and addressing the complexities, risks, opportunities and the Fund's strategic response to climate change (Figure 4).

The CCIS seeks to address climate-related investment risks to the portfolio. This involves analysing risks, setting carbon reduction targets, investing in solutions to drive the transition to a low-carbon economy, and engaging with companies, peers and policy makers to encourage emissions reductions, transition planning and climate-resilient economies.

Our management team is responsible for ensuring that the elements of our CCIS are integrated into relevant investment processes, decisions and actions. Progress on implementing the CCIS is a key component of the Guardians' sustainable finance annual reporting to the Investment Committee and the Board.

Ultimately, the CCIS – together with the Crown Responsible Investment Framework and our Net Zero Asset Owners Commitment – provides the impetus for our Climate Action Plan [see Section 4.4].

(A) ANALYSE

The aim of the Analyse pillar is to progressively integrate climate-related analyses into our portfolio management policies, systems and processes. This includes considering a range of plausible climate-related scenarios, and incorporating climate-related risks and opportunities into investment analysis and decision-making for new and existing assets.

Climate scenario analysis

Climate scenarios represent a series of assumptions, analyses and informed judgement used to establish plausible projected future pathways and outcomes for global climatic and socio-economic conditions.

Climate scenario analysis and practice continue to evolve, with an enhanced evidence base, modelling sophistication, and consolidation of standards and approaches. However, most mainstream climate models and associated scenarios retain significant limitations due to inherent conceptual or practical constraints; this means approaches often underrepresent the degree of complexity, ambiguity and potential volatility in projected pathways or outcomes.

For example, interrelated transition and physical climate risks may compound or be unevenly distributed across time, geographies and/or sectors of society - potentially leading to divergent, unpredictable outcomes.

Recognising our diverse global portfolio and the inherent complexity and limitations of climate scenarios, we avoid assigning a high degree of conviction to any particular outcome or trying to optimise our Fund for a specific normative scenario. Our approach is to explore a series of plausible scenarios and position the portfolio to be resilient and responsive to a range of pathways.

We apply a dual approach to scenario analyses; considering both top-down / long-term, and bottom-up / near-term perspectives on our portfolio and underlying holdings. Our approach focuses on blending the use of top-down climate scenarios to explore implications, test sensitivities, frame narratives, and inform more detailed, bottom-up climate risk analyses.

In 2023, the Guardians adopted the Network for Greening the Financial System (NGFS) scenarios as a top-down, long time-horizon input, due to their: integration of transition and physical factors; regular updates based on leading international climatic and economic research; transparency of key underlying assumptions and limitations; and consideration of a range of policy ambitions, climate action, technological developments, emissions pathways, and geophysical processes.

The three NGFS scenarios we apply on a high-level, long-term (2050; 2100) basis are **Current Policies**, **Delayed Transition** and **Net Zero by 2050**. See Figure 5 and Table 1 for further information.

Under the Current Policies Scenario, the world is headed for around 3-degrees of global warming by 2100, meaning that physical risks are high and transition risk is relatively low. The Delayed Transition Scenario indicates a disorderly pathway towards a net zero carbon economy by 2050, and assumes there are average physical risks to the portfolio. The Net Zero Scenario assumes an orderly transition to a net zero economy, with low to average physical risks.

Over 2023-25, the NGFS updated their base scenarios to account for the latest GDP data, demographic projections, geopolitical context, and country-level climate commitments. Key changes include:

- Addressing significant geopolitical developments and climate policy revisions e.g. US 'Inflation Reduction Act', Paris Agreement COP outcomes, armed conflicts, etc.
- Updated projected technology pathways e.g. recognising the reduced technology readiness levels of carbon dioxide removal, relative to previous assumptions.

- Enhanced modelling of acute physical risks, with the inclusion of two more hazards (droughts and heatwaves), chronic physical climate risks, and increased geographical granularity - with the net effect of higher projected net economic damages.

Figure 5: High-level NGFS climate scenarios (blue shading) adopted by the Fund

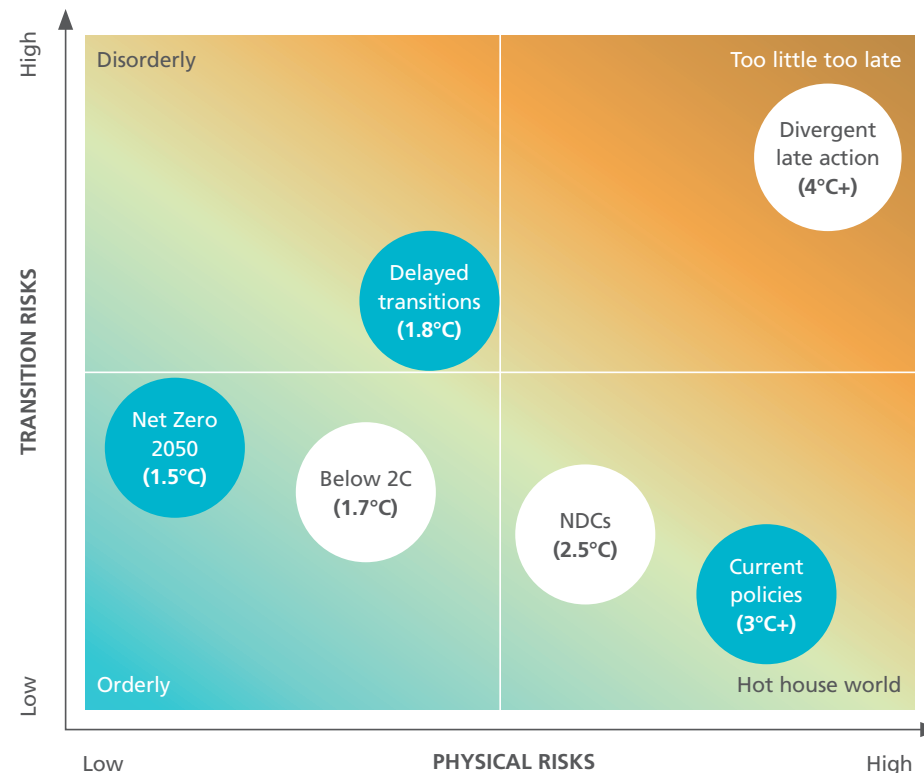


Table 1: Narrative, key features and use cases for high-level climate scenarios adopted by the Fund

Scenarios ¹	Net Zero 2050	Delayed Transition	Current Policies
Implied (2100) temperature rise²	1.5 °C	<2 °C	~3 °C
Rationale for adoption	- Aligns with Net Zero Asset Owners Commitment (NZAOOC) - Reflects our Paris-aligned Reference Portfolio. - Prescribed under NZ Climate Standards	- Reflects stop/start nature of Paris Accord/COPs. - Reflects lower end of emissions trends and market pricing 'Inevitable Policy Response'	- Reflects higher end of emissions trends and market pricing - Enables ongoing tracking of current ITR - Prescribed under NZ Climate Standards
Exploratory use cases	Extreme transition (policy/tech) risks.	Moderate transition (policy/tech) risks.	Lower transition (policy/tech) risk
	Moderate physical climate risks (potentially underestimated)	Moderate-to-high physical climate risks	Extreme physical climate risks
Key features	Ambitious/stringent policy change; moderate regional variation	Delayed, ambitious, disorderly policy change; high regional variation	Deferred, unambitious or abandoned policy change; moderate regional variation
	Paris Accord goals ambitiously pursued	Paris Accord action deferred	Paris Accord goals missed; Current policies only - chronic political inaction
	High rate of technology transition	Moderate rate of technology change, followed by rapid transition	Slow rate of technology transition and investment.
	Medium/high reliance on carbon dioxide removal methods	Low/medium reliance on carbon dioxide removal	Low/no reliance on carbon dioxide removal methods
	Net zero by 2050	Net zero by 2060	Net zero unclear
	50% chance of limiting GW to 1.5°C by 2100 (low overshoot)	67% chance of limiting GW to <2°C by 2100	Low chance of limiting GW to <2°C by 2100
	Moderate, 'locked-in' physical climate change impacts (greater certainty)	High physical climate change impacts (moderate uncertainty)	Extreme physical climate change impacts (moderate uncertainty)
Equivalent scenarios / sources³	IPCC/NIWA: SSP2-RCP1.9 NZ Climate Change Commission (CCC): 'Tailwinds'	SSP2-RCP2.6 CCC 'Headwinds'	SSP2-RCP4.5 CCC 'Current Policy'

1. Source (model): NGFS (REMIND-MAGPIE 3.3-4.8 Nov 2024).

2. Relative to pre-industrial times.

3. Shared Socioeconomic Pathways (SSP)-Representative Concentration Pathways (RCP).

Climate-related investment risk analysis

We continue to progressively build further climate-related risk considerations into investment analyses and portfolio management processes as the methods and tools available evolve.

Our approach to climate risk analysis and integration includes:

- Requirement to apply climate scenario analysis within guidelines and templates for screening prospective new investments, where material and feasible.
- Estimating the Climate Value-at-Risk (CVaR) associated with existing and new prospective investments in listed equity portfolios.
- Applying our Climate Change Valuation Framework (CCVF) for unlisted assets to assess and, where possible, integrate material and quantifiable climate-related risks and opportunities into our asset valuations (Figure 6).
- Encouraging and supporting our investment managers and internal investment analysts and strategists to challenge key assumptions with climate change considerations in their core investment analyses.

Climate-related investment impacts - current and potential future

As a globally diversified asset owner, the Fund's assets are impacted by climate change in a range of manners. Some current climate impacts are already manifesting themselves.

Climate-related risks have multiple drivers including technological change, policy actions, and planetary processes. These drivers affect both listed and unlisted assets but may impact them in different ways across a range of timeframes, sectors and geographies.

Risks may arise from: supply and demand changes from substitution; higher cost structures; consumer preference and regulation; increasing prevalence of litigation in relation to perceived action or inaction on climate change; physical damage or disruption to industries and economies, and/or; the inability to adapt at a reasonable pace, scale and cost. It is likely that the scale, complexity and compounding nature of these impacts will change significantly in the future, hence it is important for us - as a long-term investor - to take them into account now.

Mitigating climate change requires a range of transitions, of which the greatest is the shift to a low-carbon energy system, affecting all sectors of the global economy. Climate change offers opportunities for investment, including, for example, in the development of more efficient alternative energy technologies.

The Guardians has adopted a prudent approach to pro-actively identifying and addressing current and anticipated future climate-related risks and opportunities where we assess them to be most material (see Section 4.4 Climate Action Plan).

However, climate-related data quality, modelling and methods remain subject to significant limitations and uncertainties, such that it is not always feasible to effectively and consistently translate climate-related risks and opportunities into specific estimates of current and/or anticipated asset values (see Box 1).

BOX 1: Adoption Provision 2 – Anticipated Financial Impacts [CS2-12] - Partially applied

The Guardians has opted to disclose approximations of current / anticipated financial implications of climate-related physical and transition impacts in the form of estimated CVaR for our listed portfolio only (see Section 5.2).

For the majority of our unlisted portfolio, we consider climate-related aspects in our risk and/or valuation processes. When factoring in the impact of our prior and ongoing efforts to avoid and mitigate climate risks (or exploit opportunities) through our CCIS, we have not yet found robust grounds for accurate, verifiable recognition of material net asset value adjustments. See below for further discussion.

Listed (public) assets

The Fund's listed equities portfolio accounts for the largest portion of assets under management. Since 2021, we have proactively monitored the exposure of this portfolio to climate change, using MSCI CVaR analysis. Section 5.2 presents the results from CVaR analysis as of 30 June 2025.

The Guardians seeks to estimate the CVaR as a forward-looking and returns-based assessment to approximate the financial implications of climate-related risks and opportunities in our investment portfolio and underlying assets.

By integrating carbon price estimates, physical climate modelling, and company-specific attributes, CVaR projects how transition and physical risks might impact on a listed company's present value, under our three different NGFS climate scenarios (as updated from time to time).

CVaR combines current and anticipated future financial implications for public companies. However, it remains difficult to determine the extent to which climate-related factors have already been accurately priced into listed equities markets. Prices are subject to adjustment at any time as part of an active market.

The CVaR method includes limitations due to key data gaps, assumptions and approximations (Section 6), but can be useful for providing high level insights, indications for further analysis, and as an input to strategies to address the most obvious or extreme exposures to policy, technology and/or physical risks (see 4.4 Climate Action Plan).

Unlisted (private) assets

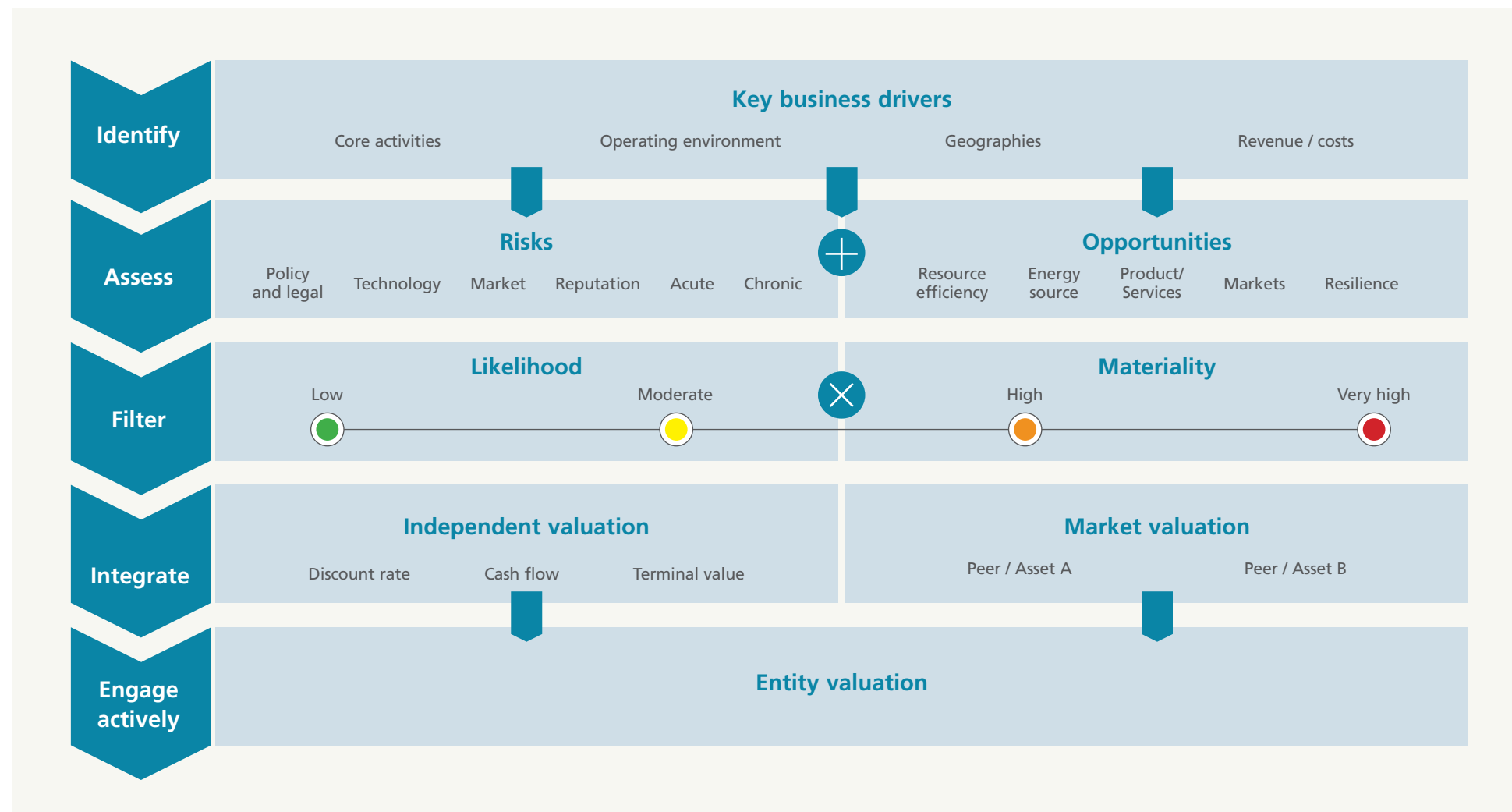
Due to often limited information availability for unlisted assets, we take a different approach to climate risk analysis for the Fund's new and existing private investments.

Our custom CCVF (Figure 6) offers a structured approach to guiding investment professionals through a bottom-up process of identifying, assessing and addressing climate change considerations in their analysis of new and existing unlisted (private) investments. This involves five iterative steps:

- **Step 1: Identify** the investee company or fund's core activities, strategies, operating environments, commercial drivers, geographies, etc. in which it operates.
- **Step 2: Assess** the sources of climate-related risks and opportunities to assess how assets might be affected. This process begins by applying the three high-level NGFS scenarios, then exploring a bottom-up perspective on how the features of each scenario might affect the key aspects identified in Step 1, through six lenses:
 - Physical impacts from chronic or acute events linked to climate change.
 - Disruption driven by the development of technology to support a low-carbon economy.

- Costs and complexity arising from evolving policies and regulations designed to address climate change and/or encourage sustainability.
 - Changes in economic and social factors affecting demand and supply.
 - Resource availability and slow onset shifts in environmental factors.
 - Legal liabilities: Such as from parties seeking compensation for loss and damage from the effects of climate change.
- **Step 3: Filter** the sources of climate-related risks based on their perceived materiality.
 - Risks considered immaterial are not factored into valuation models, but are mentioned in supporting commentary.
 - For material risks, as a minimum, aim to identify the likely general directional impact on the attractiveness and expected returns of the investment.
 - Where feasible for high-confidence material risks, try to quantify the climate implications within valuation models.
 - **Step 4: Integrate** the material and quantifiable climate-related risks and opportunities into our valuation models. We have three methods for this – listed in order of preference: (i) adjusting cash flows (revenue, costs, capital expenditure) during the forecast period; (ii) adjusting the terminal value, or; (iii) adjusting the discount rate. The valuation adjustments and commentary are peer reviewed and passed to the CIO (or delegate) - and are built into decisions on whether we buy, hold or sell the asset.
 - **Step 5: We own assets actively.** This may include the exercise of voting rights, engagement with companies and/or active roles on fund or company oversight bodies. We aim to monitor business performance against climate change standards and metrics.

Figure 6: Our Climate Change Valuation Framework (CCVF)



We have applied the CCVF to our existing Direct Investments portfolio, with Step 2 completed for all assets and Steps 3-5 at various stages based on perceived relative materiality of climate-related risk for assets.

For assets or initiatives assessed to have sufficient data, conviction and potentially-material climate risks and opportunities, qualitative aspects have been integrated into investment analysis and decision-making. This has contributed to a number of prospective new investments being rejected, or subjected to further dedicated climate risk due diligence, analysis, or integration of mitigation and resilience measures.

In some instances, our analysis established sufficient conviction for us to adjust projected yields, increase capital expenditure projections to mitigate climate risk, and/or make operational adjustments to address transition risks/opportunities or increase climate resilience.

The Guardians' Valuation Working Group is responsible for reviewing the valuations of unlisted investments provided by independent third-party valuers. External valuers are requested to provide commentary and analysis on the net impact of climate change on the valuation of any unlisted investments considered to be exposed to potentially material risks. To date, the approaches, analyses and outputs provided have been variable, with some external valuers more advanced at considering potential climate-related valuation impacts than others.

Since 2023, we have enhanced our approach by: improving tools to make it easier for investment professionals to implement the CCVF; further integrating the three NGFS climate change scenarios into our investment screening template; and applying additional analytical tools such as MSCI's CVaR, and the Woodwell Climate Exposure Risk Application.

As climate-related data, modelling, methods and tools improve - and global good practice and standards on financial 'connectivity' evolve - we will continue to review our approach to climate-related risk, financial impact analysis, and disclosure.

(B) REDUCE

The Guardians' financed GHG emissions (Scope 3; Category 15) - representing the transition risk exposure of the underlying securities and investees companies in the Fund - are the most material aspect of climate-related risk from across our value chain. The aim of the Reduce pillar of our CCIS is to limit the Fund's exposure to investments that are most at risk from the transition to a low-carbon society and physical climate change. We do this by

reducing the exposure of our portfolio to investments with the highest emissions intensity, potential emissions from fossil fuel reserves, and/or climate value-at-risk.

The Board set our first Fund-wide carbon reduction targets for 2020, followed by more ambitious targets for 2025. In 2024-25, the Board endorsed a revised approach and methodology for GHG emissions measurement to bring the Guardians into closer alignment with the internationally-recognised GHG Protocol and Partnership for Carbon Accounting Fundamentals (PCAF).

The Board also approved the setting of new emissions reductions targets for 2030, aligning with global good practice and frameworks, while staying consistent with our mandate. In setting these new targets, we considered: what level of effort is consistent with the world aligning with net zero; what we can achieve as part of prudent portfolio management, and; our ability to influence real-world change through strategic asset management (e.g. higher-emissions investments that demonstrate a strong climate transition strategy and potential for strong returns).

See our 4.4: Climate Action Plan for more information on our practical approach, and Section 5.1 for our GHG emissions inventory metrics and reduction targets.

(C) ENGAGE

The goal of the Engage pillar is to improve the analysis, management and reporting of climate-related risks by the companies we invest in. We report on our stewardship and engagement activities in our Annual Report and on our website.

We are committed to being an active owner of assets. This means we exercise our voting rights for listed equities in line with our voting policy guidelines on climate change.

We work with the boards and management teams of companies that we invest in directly to address climate-related issues. Where we work with external managers, we include climate-related clauses into investment mandates, to the extent possible and relevant.

As part of our active ownership, external managers are asked about their climate change approach and activities through ESG due diligence surveys approximately every two years. We also ask our external managers to report on their portfolio GHG emissions.

From time to time, we engage with policy makers through public consultations, including in New Zealand, in areas that are relevant to our investment mandates. We have made submissions supporting increased climate action, including on the Standards.

Engagement activities specifically on climate change include the following:

- We share an external engagement service provider with the other Crown Financial Institutions (CFIs), to lead engagements with companies in our global equities portfolio. In 2024-25, the service engaged with 214 listed companies on climate change on behalf of all the CFIs, including 304 individual engagement activities and 46 engagement milestones achieved. These CFI engagements included engagements with 105 companies held in the Fund's portfolio, with 142 engagement activities and 16 milestones achieved. Quarterly engagement reports are published on our website.¹
- In 2023, the CFIs launched an initiative to engage on climate change with listed New Zealand companies, in particular the NZX50. We achieved our target of engaging with 10 NZX50 companies in 2024 and are exploring next steps. More detail is included in our 2025 Stewardship Report.
- In addition to being a signatory to the Net Zero Asset Owner Commitment, our memberships include: Climate Action 100+, an investor-led initiative to engage with the world's largest corporate GHG emitters take action on climate change; the Investor Group on Climate Change (IGCC), and; the Australian Council of Superannuation Investors (ACSI), which engage with companies on climate-related issues on behalf of institutional investors in Australasia.
- We play an active role in other organisations that are working to address climate change, including: the United Nations-backed Principles for Responsible Investment; the Responsible Investor Association of Australasia, and; the One Planet Sovereign Wealth Fund initiative - established in 2017 to accelerate efforts to integrate financial risks and opportunities related to climate change in the management of large, long-term asset pools.

(D) SEARCH

The Search pillar is about taking advantage of opportunities presented by the prospects of a transition to a lower-carbon and more climate-resilient world. Investing in climate solutions plays a role in mitigating or adapting to climate change, supporting national and international climate goals and commitments, and reducing systemic risks to the economy.

As part of the Fund's 'Total Portfolio Approach', we set how much risk we allocate to each of our 'Opportunities' through a periodic Risk Budget Review process. The output of this process informs the nature, scale, and risk: return profile of subsequent asset buy/hold/sell decisions across the portfolio.

Our Risk Budget Review approach incorporates judgements on the inherent ESG profiles of each of the portfolio opportunities. In line with our investment beliefs, ESG factors – with a focus on climate change - are considered, alongside the expected 'Information Ratio' and alignment with our endowments. This process determines the risk budget allocation for each opportunity.

The last review outcome included upweighting risk budgets for 'Infrastructure' and 'Sustainable Transition' (private equity) on the basis of the expected positive environmental and social outcomes linked to our investment strategy.

Leveraging upweighted risk budgets for opportunities with inherent potential for both positive investment returns and climate outcomes meant we were able to increase investment in sustainability solutions between 2023-25. A case study of a climate-related impact investment is included below, with additional investments and information available in the Sustainable Investment section of the Annual Report and our 2024 Climate Change Report.

The Guardians defines **Impact Investments** as: *"Investments made with the intent to deliver measurable positive social and/or environmental impacts, and the Fund's required financial return."*

In assessing new prospects, our objective is to scale impact investments through integration across our team and set of opportunities, whilst maintaining our usual investment discipline. We see potential impact investment opportunities in areas such as low-carbon or transitional infrastructure, private equity, and other assets that may benefit from the system change and capital required to address systemic risks and opportunities in the coming years.

1. <https://www.nzsuperfund.nz/how-we-invest/sustainable-finance/engagement/>

CASE STUDY:



THE REFORESTATION FUND, TIMBER INVESTMENT GROUP, LATIN AMERICA

In 2022, the Guardians committed US\$100m to The Reforestation Fund (TRF) - an impact-focused investment strategy managed by the Timberland Investment Group. TRF aims to generate long-term financial returns while contributing to global efforts to address climate change, biodiversity loss, ecosystem degradation and the development of rural communities through local processing facilities and job creation.

TRF invests in a diversified pool of greenfield, climate-positive timberland and wood product processing assets, with a focus on Brazil, Uruguay and Chile. It combines large-scale afforestation of degraded pasture land with protected and restored native forests. At least 50% of the total land acquired is set aside for conservation and restoration.

TRF intends to protect and restore 135,000 hectares under special conservation designation. The Fund's commitment to TRF is expected to support the generation of approximately 4.3 million carbon credits over the term of the TRF.

This work has attracted global interest, with major corporates signing long-term agreements to purchase nature-based carbon removal credits generated by TRF's activities. Under an agreement with Microsoft, the project will deliver up to 8 million nature-based carbon removal credits through to 2043.

4.4. CLIMATE ACTION PLAN

We do not seek to optimise our portfolio based on a single normative or 'base case' scenario. Rather, the Guardians of the Future, our Sustainable Finance Strategy, CCIS and Climate Action Plan aim to position the Fund in readiness to adapt to a range of uncertain global and local climate and socio-economic pathways and outcomes.

The Guardians has opted to disclose transition-related aspects of our strategy covering approximately 68% of the Fund's assets under management (AUM) in Section 4.3 Climate Change Investment Strategy and 4.4 Climate Action Plan. We will continue to review and revise our approach to climate-related strategy, transition (action) planning, and disclosure.

The Guardians and other CFIs signed up to the Net Zero Asset Owners Net Zero Commitment, involving approximately 60 investors representing over US\$3.3 trillion in combined AUM. This means we will take deliberate actions to help put the world on a path to achieving net zero emissions by 2050. The Commitment requires us to:¹

- review and update our targets every five years or sooner;
- report annually on the strategy and actions implemented;
- track progress towards achieving objectives and targets, and;
- disclose in line with the TCFD (or equivalent).

Under this Commitment and informed by our existing CCIS, we submitted a Climate Action Plan in 2022 prioritising the most material climate-related risks and opportunities across our largest asset classes. These were determined to be Scope 3 emissions under the following:

- Passive global listed equities portfolio, representing approximately 50% of the Fund's total AUM;
- Active quantitative multi-factor strategies (approximately 14% AUM), and;
- Corporate debt securities portion of our passive fixed income portfolio (approx. 3% AUM).

We consider materiality of climate-related risks for smaller asset class exposures on a case-by-case basis, as appropriate.

1. <https://www.parisalignedassetowners.org/signatory-disclosures>

(A) PASSIVE GLOBAL LISTED EQUITIES

Following extensive research, analysis, testing and consultation - and in accordance with its responsibility to determine the benchmarks against which we measure our investment performance - the Board adopted a new 'Paris-Aligned' benchmark for our passive listed equities portfolio in 2022.

This involved applying an off-the-shelf methodology from MSCI aimed at reducing exposure to climate-related risks, supporting transition of high impact sectors, and increasing exposure to climate solutions.

Practically, this involved changing the benchmark of our passive equities portfolio from the MSCI ACWI IMI (Investable Markets Index) to a combination of MSCI: World Climate Paris Aligned Index, and the Emerging Markets Climate Paris Aligned Index.

The Paris Aligned Benchmark indices are designed to enhance overall ESG performance beyond emissions reductions, through inclusion of additional criteria and characteristics (Figure 7). This includes increased capital allocation to climate solutions and reducing estimated CVAR associated with the portfolio – based on an approximation of transition and physical risks from climate change.

While these Paris Aligned indices should ensure that the Fund's passive global equity positions are better aligned with net zero objectives, they do not always fully eliminate exposures to fossil fuel reserves. We apply a negative screening overlay to our passive equity holdings to further reduce exposure to residual potential emissions from fossil fuel reserves.

(B) ACTIVE QUANTITATIVE MULTI-FACTOR PORTFOLIO

We further advanced our Climate Action Plan in 2023-25 by working with our external managers of active quantitative multi-factor investment strategies. This involved testing a range of options for meeting our GHG reduction targets and addressing similar ESG objectives to the (passive) Paris Aligned Benchmark indices (Figure 7). The outcome included amending some large investment mandates to more explicitly reflect our sustainable finance goal, whilst allowing our managers flexibility in how they address ESG objectives as part of their custom strategies and investable universe.

Figure 7: Climate-related criteria applied to the Fund's passive equity portfolio benchmark

TRANSITION RISK		GREEN OPPORTUNITY	1.5°C ALIGNMENT	PHYSICAL RISK
Carbon intensity reduction (Scopes 1, 2 and 3)	Neutral exposure to high-impact sector	At least double the green revenue exposure	Self-decarbonisation at 10%	Physical Risk Climate VaR is at least 50% lower
Immediate Scope 3 phase-in	Higher allocation to companies with credible emissions-reduction targets	Green/fossil fuel-based ratio – 4x higher than parent	Neutral Aggregate Climate VaR under 1.5°C Scenario	
Underweight companies facing transition risk	Significant improvement in Low Carbon Transition (LCT) Score	Overweighting of companies providing solutions		
Lower fossil fuel exposure	50% minimum reduction in Potential Emissions Intensity			

(C) CORPORATE FIXED INCOME / BOND PORTFOLIO

We reviewed our Fixed Income portfolio in 2024, seeking opportunities to improve ESG incorporation and outcomes. As part of the review, we considered: approaches to ESG integration in fixed income assets (bonds); options for aligning our fixed income portfolios with our net zero commitment, and; explored bringing our fixed income portfolio in scope of our GHG emissions inventory.

We shifted the corporate portion of our passive bond mandate to a Paris-Aligned Benchmark in January 2025.¹ Similar to our passive equity index, this new index applies a range of improvements to the ESG performance of our corporate fixed income portfolio, including reducing emissions intensity, increasing holdings from companies actively investing in climate solutions, and removing holdings of a number of companies facing severe controversies.

1. This shift to the corporate bond portfolio applies to the benchmark we use to implement our corporate fixed income exposure only, not to the Reference Portfolio benchmark.

5.

Metrics and Targets



We estimate
 the GHG
 emissions
 intensity,
 potential
 emissions from
 fossil fuel
 reserves, and
 climate value-
 at-risk of the
 Fund's
 portfolio each
 year

5.1. GREENHOUSE GAS EMISSIONS

The Guardians' determined our financed GHG emissions (Scope 3; Category 15) to be the most material aspect of climate-related risk from across our value chain (see Box 2).

The Board sets the Fund's GHG emissions reduction targets and methods every five years. To monitor progress, we calculate the emissions intensity of the Fund's portfolio, along with potential emissions from fossil fuel reserves each year; reporting via an internal Sustainable Finance Report and this Climate Change Report (published annually on our website).

Having substantially revised our GHG emissions measurement methodology in FY2024-25, we have disclosed metrics in accordance with both our **current** management criteria (market cap based) and **revised** management criteria (mostly EVIC-based) to effectively address:

- the final reporting year of current metrics and Board-approved targets for 30 June 2025;
- the baseline year for the revised GHG emissions inventory and metrics;
- our Statement of Intent 2024-29 (straddling both target periods), which references requirement for an externally-assured 'carbon foot print';
- potential future need for retrospective analysis across the period of transition from our current to the revised methods and targets.

GHG metrics rely on third-party data and estimates, especially for Scope 3 and unlisted assets; coverage and quality vary by asset class. Annex A (current management criteria) and Annex B (revised management criteria) detail the basis of preparation for our GHG emissions disclosures.

The GHG Emissions Inventory and associated disclosures under both management criteria have been subject to external limited assurance. Refer to the appended Independent Assurance Report for full details.

BOX 2:

Adoption Provision 4 - Scope 3 GHG emissions [CS2.17]

Adoption Provision 5 - Comparatives for Scope 3 emissions [CS2.18-19]

For FY2024-25, we have elected to disclose Scope 3 GHG emissions metrics in accordance with both our **current** and **revised** management criteria.

Under the **current** management criteria, the Guardians calculates and discloses the emissions intensity and potential emissions from fossil fuels for the majority of our portfolio, including comparative data for our benchmark, trends linked to preceding reporting periods, and performance against our targets (2021-25). See Section 5.1a), Table 2, Figure 8, and Annex A.

Under the **revised** management criteria, the Guardians calculates and discloses the absolute gross emissions, emissions intensity, and potential emissions from fossil fuels for the majority of our portfolio. With 2025 being the baseline year, future reporting periods will include year-on-year trends analysis and performance against our 2030 targets. See Section 5.1b), Tables 3-8 and Annex B for details.

Adoption Provision 8 - Scope 3 GHG emissions assurance [CS2.24-25]

Scope 3 GHG emissions measurement approaches and outputs from both **current** and **revised** management criteria have been subject to external limited assurance. Refer to the appended Independent Assurance Report for full details.

(A) CURRENT GHG EMISSIONS INVENTORY METRICS AND 2025 TARGET

In 2020, we set carbon targets for 2025, relative to our benchmark (the market-weighted, unadjusted Reference Portfolio at the end of each reporting year), to:¹

- *reduce emissions intensity of the Fund by at least 40%, and;*
- *reduce the potential emissions from fossil fuel reserves of the Fund by at least 80%*

As of 30 June 2025, we had significantly exceeded our targets, with the Fund's emissions intensity estimated as **64.3%** lower than the target benchmark, and our exposure to potential emissions from reserves estimated as **99.4%** lower (Table 2a).

Consistent with the other CFIs, we also provide figures for the reduction in the Fund's emissions intensity and fossil fuel reserves relative to the 2019 unadjusted Reference Portfolio (Table 2b).

1. See Glossary for definition of the 'Unadjusted Reference Portfolio'

Table 2a: Emissions intensity and potential emissions from fossil fuel reserves of the Fund relative to unadjusted Reference Portfolio (2021-25) ^{1,2}

Reporting year, as at 30 June:	2021	2022	2023	2024	2025
Emissions Intensity (metric tonnes carbon dioxide equivalent (mTCO₂e) / \$USm in sales)					
Unadjusted Reference Portfolio	207.1	194.8	175.8	167.2	152.8
Actual Portfolio	109.5	99.4	70.9	59.6	54.6
% reduction [2025 target -40%]	-47.1%	-49.0%	-59.7%	-64.4%	-64.3%
Potential emissions from fossil fuel reserves per USD million invested (mTCO₂e / \$USm NAV)					
Unadjusted Reference Portfolio	1,663	1,524	1,331	1,247	738
Actual Portfolio	106	134	16	23	4.3
% reduction [2025 target -80%]	-93.6%	-91.2%	-98.8%	-98.2%	-99.4%

1. See Glossary for description of the 'unadjusted Reference Portfolio', and Annex A for the Basis of Preparation.

2. With emissions attributed on a market capitalisation basis

Table 2b: Emissions intensity and potential emissions from fossil fuel reserves of the Fund relative to unadjusted Reference Portfolio (2019)

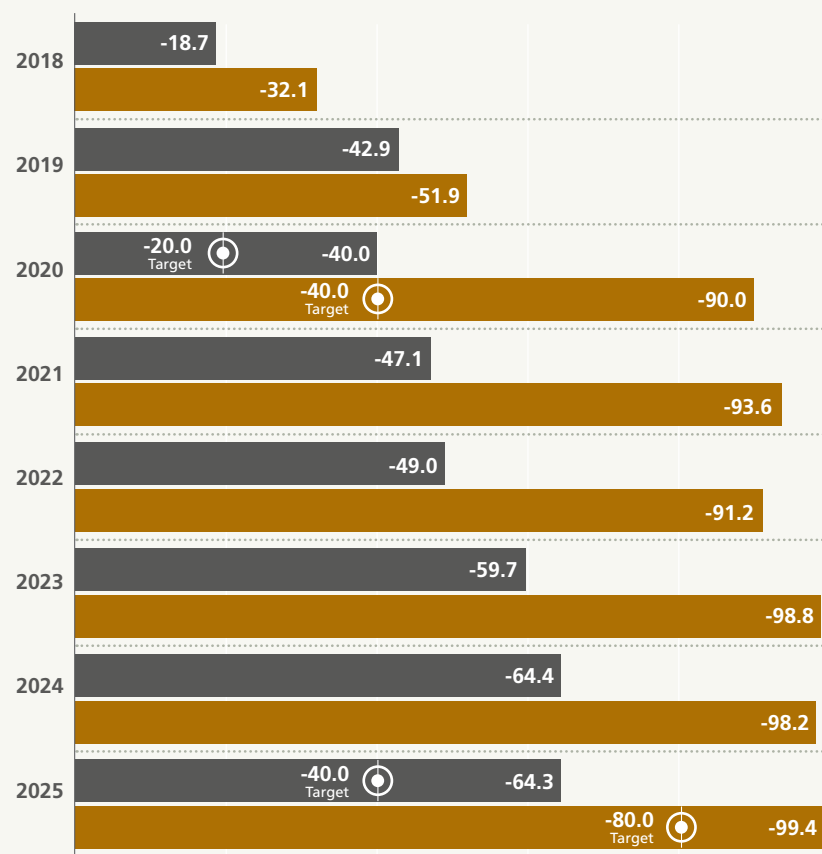
	Emissions Intensity (mTCO₂e / \$USm in sales)	Potential emissions from fossil fuel reserves (mTCO₂e / \$USm NAV)
Unadjusted Reference Portfolio (2019)	230.7	2,740
Actual Portfolio (2025)	54.6	4.3
% reduction [targets not applicable]	-76.3%	-99.8%

Figure 8: The Fund's emissions reduction journey (2018-25)

KEY PERFORMANCE MEASURES AND MILESTONES FROM OUR CLIMATE CHANGE INVESTMENT STRATEGY

- Emissions intensity
- Exposure to potential emissions from fossil fuel reserves

Annual % reductions, relative to our unadjusted Reference Portfolio as at 30 June of each reporting year



2016-2020

- Launched our Climate Change Investment Strategy (FY17)
- Set our initial carbon reduction targets through to 2020 (FY19)
- Published first TCFD-aligned annual disclosures (FY20)
- Set new carbon reduction targets for 2025 (FY20)

2021-2025

- Agreed the Crown RI Framework (FY21)
- Joined the Net Zero Asset Owners Commitment (FY22)
- Shifted global listed equities to Paris Aligned Benchmark indices (FY23)
- Launched engagements with NZX50 companies to encourage them to manage and report on climate risks and targets (FY23-24)
- Adopted measures to improve the ESG profile of our multi-factor (FY24) and passive corporate fixed income portfolios (FY25)
- Revised our disclosures in alignment with XRB New Zealand Climate Standards (FY24)
- Revised methodology and management criteria for GHG emissions measurement, with reference to the Partnership for Carbon Accounting Fundamentals (FY25)
- Set new GHG emissions reductions targets for 2030 (FY25)

(B) REVISED GHG EMISSIONS INVENTORY METRICS AND 2030 TARGET

In FY2025, the Board approved a new GHG emissions measurement methodology and reduction targets for 2030, relative to our benchmark (the market-weighted, unadjusted Reference Portfolio as at 30 June 2019), to:

- *reduce the emissions intensity of the Fund by at least 75%, and;*
- *reduce potential emissions from fossil fuel reserves of the Fund by at least 80%*

Our Management Criteria draw primarily on the GHG Protocol and elements of PCAF. We do not claim full PCAF alignment, and where methodologies are incomplete or impractical for our purposes, deviations and rationales are documented in Annex B.

Metrics are primarily on an enterprise value including cash (EVIC) basis, except where indicated in Annex B.

We disclose the emissions intensity (Table 3) and potential emissions from fossil fuels reserves (Table 5) for the Fund portfolio, which together form the basis of our GHG emissions targets. Furthermore, we disclose other GHG metrics in line with PCAF, comprising an absolute gross emissions inventory (Table 6) and the carbon footprint of the Fund (Table 8) - neither of which are subject to targets.

For some metrics (Table 4; 7), we isolate data for our sovereign bond holdings (and derivatives) separately – including production versus consumption-based perspectives and intensity. These do not form part of our target benchmark.

We provide estimates of data coverage for some metrics, indicating the percentage share of total exposure for each asset class, for which minimum required data is available in usable format.

Table 3: Emissions intensity of the Fund¹

Assets class (excluding sovereign bonds)	Data coverage	Emissions intensity Scope 1+2 (mTCO ₂ e / US\$m total sales)
Listed equities ^d	99.6%	28.24
Corporate bonds ^d	85.0%	107.45
Unlisted assets (including private equity)	79.9%	247.62
Unlisted assets (business loans)	-	-
Commercial real estate	39.1%	20.53
Actual Portfolio total (as at 30 June 2025)	90.4%	53.45
^d includes equivalent derivatives;		

1. With emissions attributed on an EVIC basis

Table 4: Emissions intensity of the Fund sovereign bonds

Sovereign bonds only (and derivatives)	Actual Portfolio (as at 30 June 2025)
% data coverage	98.2%
Portfolio weighted capita	104,839
Consumption (demand) emissions per capita (mTCO ₂ e / capita)	11.34
Production emissions per PPP-adjusted \$1M GDP (mTCO ₂ e /PPP adjusted GDP m international \$)	204.94

Table 5: Potential emissions from fossil fuel reserves per amount invested

Portfolio	Potential emissions (mTCO ₂ e / US\$ NAV)
Actual Portfolio total (30 June 2025)	6.2

Table 6: Absolute gross GHG emissions inventory for the Fund¹

Asset classes	Scope 1 + 2 GHG emissions			Scope 3 GHG emissions		
	Absolute gross emissions (mTCO ₂ e)	% data coverage	Data quality score	Absolute gross emissions (mTCO ₂ e)	% data coverage	Data quality score
Listed equities ^d	244,230	99.7	2.18	3,519,513	99.7	2.28
Corporate bonds ^d	116,926	96.8	2.65	386,545	86.4	2.45
Unlisted assets (inc. private equity)	267,160	94.3	-	330,180	93.4	-
Unlisted assets (business loans)	6,548	100.0	-	50,883	100.0	-
Commercial real estate	15,148	100.0	-	38,798	53.2	-
Actual Portfolio total (30 June 2025)	650,012	96.6	-	4,325,919	93.7	-
^d includes equivalent derivatives						

1. PCAF data quality scores indicate what proportion of data is measured, reported, estimated, and/or assured, etc. (1=Highest quality, 5=Lowest quality). Only stated for Listed equities and bonds for this year.

Table 7: Absolute gross GHG emissions inventory for the Fund's sovereign bonds

Sovereign bonds (and sovereign bond derivatives)	Actual Portfolio (as at 30 June 2025)
Absolute Scope 1 emissions (mTCO ₂ e)	1,172,557
% data coverage	100.0%
Consumption (demand) emissions (mTCO ₂ e)	1,058,534
Production emissions (mTCO ₂ e)	1,188,533

Table 8: Carbon footprint of the Fund

Asset Classes (ex. sovereign bonds)	Net Asset Value / NZ\$	Asset Class Exposure	Carbon footprint Scope 1+2 (mTCO ₂ e / NZ\$m total invested)	Data coverage
Listed equities ^{di}	\$54,264,451,849	63.8%	4.51	99.7%
Corporate bonds ^{di}	\$5,122,700,835	6.0%	23.59	96.8%
Unlisted assets (including private equity)	\$11,990,329,923	14.1%	23.63	94.3%
Unlisted assets (business loans)	\$337,185,294	0.4%	19.42	100.0%
Commercial real estate	\$3,314,810,083	3.9%	4.57	100.0%
Actual Portfolio total (as at 30 June 2025)	\$76,631,337,276	88.2%	8.78	96.6%
<i>Sovereign bonds ^{dii}</i>	<i>\$8,473,039,415</i>	<i>9.9%</i>	<i>138.4</i>	<i>100.0%</i>

^{di} includes derivatives, with NAV taken as exposure of physical equivalents (notional/delta-adjusted)
^{dii} includes derivatives, with NAV taken as exposure of physical equivalents (World Bank GDP, adjusted for PPP)

5.2. CLIMATE VALUE-AT-RISK

CVaR links listed companies' net present value with an estimate of indicative value-at-risk (or opportunity) under a range of climate change scenarios and time horizons. The CVaR method is subject to limitations due to data gaps, necessary over-simplifications, assumptions and approximations. Nevertheless, the outputs can be useful for providing high level insights and indications for further analysis.

We apply the CVaR model to our listed equities portfolio using the three NGFS scenarios outlined in Section 4.3 and compare results for our Actual Portfolio against our unadjusted Reference Portfolio, as at 30 June 2025 (Table 9).

We do not disclose year-on-year trends since it is difficult to distinguish shifts in CVaR as attributable to changes in our holdings, underlying climate risk exposures, and/or scenario and model updates.

Table 9: Difference between the estimated CVaR of our Actual Portfolio versus unadjusted Reference Portfolio (as at 30 June 2025)

Portfolios		Estimated Climate Value-at-Risk (%) under each scenario ¹		
		Net Zero 2050	Delayed Transition	Current Policies
Unadjusted Reference Portfolio - net CVaR		-13.8	-7.4	-7.7
(ACWI IMI + NZX50) ²	Physical risk	-1.2	-1.9	-3.6
	Transition risk	-12.6	-5.5	-4.1
	• Policy risk	-13.7	-5.8	-4.4
	• Technology risk	1.1	0.3	0.3
Actual Portfolio - net CVaR		-2.9	-2.0	-2.7
(as of 30 June 2025)	Physical risk	-0.7	-1.2	-2.2
	Transition risk	-2.2	-0.8	-0.5
	• Policy risk	-4.4	-1.3	-1.0
	• Technology risk	2.1	0.4	0.5
Overall improvement in net CVaR (%)		10.8	5.4	5.0

1. See NGFS Scenarios (Table 1). Where negative % climate value-at-risk figures indicate a reduction in portfolio value

2. As of 30 June 2025, the MSCI All Country World Investable Market Index (ACWI IMI) + NZX50 (the 50 largest companies by market cap trading on the New Zealand Stock Exchange).

Based on our **30 June 2025** analysis:

- Our Actual (Paris-aligned) Portfolio is estimated to be better positioned than the unadjusted Reference Portfolio across all scenarios; ranging from 10.8% reduced CVaR under the Net Zero 2050 scenario, to a 5.0% relative reduction under Current Policies.
- Total estimated CVaR under all scenarios shows distinct variation between the Actual Portfolio and Reference Portfolio, with a range of relative contributions from physical, policy and technology risks and opportunities.
- The higher policy CVaR under the Net Zero 2050 scenario is likely driven by the upfront costs of climate-related policy and market risks from a rapid transition. Financial models tend to place greater relative emphasis on nearer term impacts, whilst discounting impacts on earnings or asset values over a longer timeframe (i.e. those arising from some chronic physical risks). Technology opportunities from clean tech revenues and green innovation are greater as part of an orderly and earlier transition towards Net Zero 2050.
- In every scenario, our Actual Portfolio appears significantly better at reducing physical and policy CVaR than an equivalent market-weighted unadjusted Reference Portfolio.
- Across all scenarios, we can infer that the Fund remains exposed to net negative climate-related risks. However, these risks are reduced - and the potential for upside from increased exposure to technology opportunities is enhanced - compared to a situation where the CCIS and Climate Action Plan had not been implemented.

The results are not predictive of the state that is most likely to occur. Like all climate change scenarios, the NGFS scenarios contain significant degrees of inherent uncertainty. The economic impacts of physical climate change are likely to be substantially different than those anticipated by current modelling.

Chronic physical climate-related risks under 'Current Policies' - including the impact of critical tipping points - are expected to take longer to emerge and be reflected in asset values, compared to nearer-term acute physical impacts and policy or technology shifts.

Companies have a greater degree of agency over their positioning relative to policy and technology risks and local, near-term physical risks - in comparison to the large-scale impacts from macro shifts in planetary processes such as sea level rise.

CVaR analysis does not yet factor in companies' transition plans, meaning that some of the estimated value-at-risk from the transition may be overestimated for those with well-established and feasible plans. Section 6(c) details the methods, assumptions, limitations and estimation uncertainties associated with climate scenarios and CVaR.

5.3. CARBON PRICE

We do not use a common internal carbon price across the Fund given the range of sectors and geographies in which we invest. Carbon prices may be factored in as relevant data points for specific investment analyses.

5.4. OTHER CLIMATE AND ESG PERFORMANCE MEASURES

Our adoption of the MSCI Paris Aligned Benchmark indices has enabled us to establish additional climate-related measures for our global passive equities portfolios (see Box 3). The indices aim to track and improve portfolio ESG performance against their benchmark (market-weighted parent indices) by adjusting relative weightings based on:¹

- Companies facing high transition and physical climate risk (underweight)
- Companies providing climate solutions (overweight)
- Companies with credible emissions-reduction targets (overweight)
- Exposure to 'green revenues' (overweight, by at least double)
- Low Carbon Transition (LCT) Score (improved)
- Physical Climate Value-at-Risk (at least 50% lower than benchmark).

BOX 3: Adoption Provision 6 – Comparatives for Metrics [CS2.20]; Adoption Provision 7 – Analysis of trends [CS2.22]

We do not disclose comparative information or trend analysis for climate-related metrics from previous reporting periods, other than for the Fund's Scope 3 GHG emissions metrics (Section 5.1). This is something we will consider in future as standards and data improve.

1. See MSCI for a detailed description and methodology for each of these performance measures (<https://www.msci.com/our-solutions/esg-investing/esg-indexes/climate-paris-aligned-indexes>). Our active multifactor portfolios aim to achieve many of the same performance improvements.

6.

Statement on methods, assumptions and estimation uncertainty



This report contains disclosures that rely on incomplete or estimated data, partial or provisional assessments of current and forward-looking information, and related judgements, opinions and assumptions.

Climate change is an evolving concept with high levels of uncertainty - particularly over long-term horizons. Descriptions of the current and anticipated risks and impacts relating to climate change represent estimates only. In particular, this document contains forward-looking statements and opinions about the Fund, markets, our portfolio companies and the environment in which the Guardians operates - including climate-related scenarios, metrics, targets, and statements of the Guardians' and our partners' future intentions and performance relating to them.

We base our statements and opinions on reasonable information available to us at the date of publication. These statements and opinions necessarily involve assumptions, forecasts and projections about the Guardians' future strategies and operating contexts, which may be inherently uncertain and/or subject to contingencies outside of the Guardians' direct control, particularly as to inputs, available data and modelling which is likely to change.

The risks and opportunities described in this report, and our strategies to achieve our targets, may not eventuate or may be more or less significant than anticipated. There are many factors outside of the Guardians' control that could cause the Fund's actual performance or climate-related metrics (including targets) to differ materially from that described, including economic factors, technological developments, climatic shifts, and government, consumer and/or market behaviours.

(A) FINANCIAL INFORMATION

The Guardians uses net asset value for some asset classes to calculate of GHG emissions inventory, this treatment may result in year-on-year fluctuations caused by valuation. This approach is considered appropriate and accepted as a known risk by Management.

(B) CLIMATE SCENARIOS - NETWORK FOR GREENING THE FINANCIAL SYSTEM (NGFS)

Most mainstream climate models and associated scenarios like the NGFS retain significant flaws due to inherent conceptual or practical limitations. This means approaches

often underrepresent the degree of complexity, ambiguity and potential volatility in projected pathways.¹

For example, the approach and assumptions underlying NGFS scenarios are characterised by:

- Poor appreciation and integration of complex but real physical risks, such as non-linear changes via climate tipping points, feedback loops and compounding, cumulative and interdependent climate and nature-related risks;
- Frequent lack of data granularity, geographical resolution, and consideration of asset-level vulnerabilities – a major driver of real-world risk;
- Absence of certain transition risks, such as acutely disruptive policy or technology ('social tipping points'), extreme financial market volatility (climate change-induced or otherwise), and the implication of certain physical climate impacts on asset prices, for example.
- Reliance on various assumptions about future social, economic, technological, and policy developments and pathways, which are inherently uncertain.
- Absence of non-climatic drivers of risk such as civil unrest or geopolitical conflict over e.g. diminished and/or newly accessible natural resources, systemic vulnerabilities.

In reality, interrelated transition and physical climate risks may compound and be unevenly distributed across time, geographies and/or sectors of society, potentially leading to divergent, unpredictable outcomes.

As such, outputs from most high-level scenario analyses can be considered oversimplified and too benign in most cases, potentially underestimating damages caused by climate change and associated loss of GDP.

(C) MSCI CLIMATE VALUE AT RISK (CVAR)

The CvaR method is subject to key limitations due to data gaps, necessary oversimplifications, assumptions and approximations. Nevertheless, the outputs can be useful for providing high level insights and indications for further analysis. The complete CVAR methodology is available from MSCI.²

Each scenario provides a point estimate of indicative value at risk. The estimates MSCI have produced are based on various assumptions and scenarios that, if adjusted, could significantly alter the indicative values. In particular, we note that CVaR assumes companies

discount at their Weighted Average Cost of Capital, rather than the social discount rate. Therefore, CVaR results should not be interpreted as reflecting the full social cost, nor are they predictive of the state that is most likely to eventuate.

For the purposes of this CVaR analysis we exclude some of our synthetic positions. This is because there are data limitations, and because including derivative positions that can change significantly on a day-to-day basis, would introduce undesirable short-term fluctuations which could obfuscate the more material long-term trends. We note that including these derivative positions could have a material short-term impact on these measures so these results should be interpreted with caution.

(D) GHG EMISSIONS

See Annex A (current method) and Annex B (revised method) for details on the basis of preparation, including the approach, methodology, assumptions, limitations and estimation uncertainties specific to our GHG emissions metrics and targets.

1. <https://www.ngfs.net/ngfs-scenarios-portal/data-resources>

2. https://www.msci.com/documents/1296102/39141520/Updated_PUBLIC_CVaR_Meth+doc_EEC.pdf

7.

Glossary

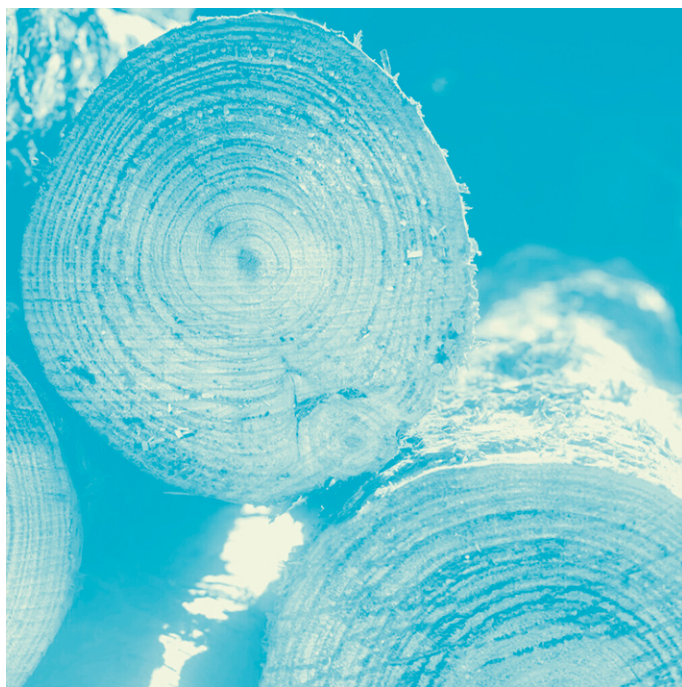


Term	Description
Access point	The actual investment the Guardians makes to gain exposure to a desired risk (e.g. buying a listed equity). Access points are our way of exploiting opportunities.
Asset class	A group of securities or assets that share common risk and return characteristics.
Baseline year	A baseline (base) year is a reference point in the past with which current emissions can be compared. Baseline years are set to maintain consistency between data sets and enable readers to make comparisons of data over time using a consistent calculation methodology.
Business loans (corporate credit)	Business loans include all on-balance sheet loans and lines of credit to businesses, nonprofits, and any other structure of organization that are not traded on a market and are for general corporate purposes, i.e., with unknown use of proceeds as defined by the GHG Protocol.
Cash	Used for cash equivalents: short-term, low-risk investments that can easily be converted to cash. Examples include bank deposits and bonds nearing maturity.
Climate scenarios	A series of assumptions, analyses and informed judgement used to establish plausible projected future pathways and outcomes for global climatic and socio-economic conditions.
Climate value-at-risk (CVaR)	A forward-looking and return-based valuation assessment to estimate climate-related risks and opportunities in an investment portfolio.
Commercial real estate	This asset class includes on-balance sheet loans for specific corporate income-generating purposes, namely the purchase and refinance of commercial real estate and on-balance sheet investments in commercial real estate. Assets include properties used as retail, hotels, office space, industrial, or large multifamily rentals.
Corporate Bonds	This asset class includes all on-balance sheet listed corporate bonds that are traded on a market and are for general corporate purposes, i.e., unknown use of proceeds as defined by the GHG Protocol.
Crown Responsible Investment Framework	In 2020–21, the Guardians collaborated with other Crown Financial Institutions (CFIs) and the New Zealand Government in developing a common ‘Crown Responsible Investment Framework’ which outlined the basis for CFIs’ alignment on carbon emissions measurement, net zero 2050 commitments, and climate-related disclosures [https://nzsuperfund.nz/assets/Uploads/Enduring-Letter-of-Expectations-to-Crown-Financial-Institutions-in-relation-to-Responsible-Investment.pdf].
Currency exposure	Foreign exchange hedging. Currency hedging is where we adjust our currency hedges to match the Reference Portfolio currency exposure, which is 100% hedged to the NZ dollar.
Derivative exposures	Derivatives are designed to gain exposure to risk without having to physically hold the assets. They are financial instruments that derive their value from that of the underlying entities to which they are linked - such as an asset, index or interest rate. It has no intrinsic value. Given that much of our equity exposure is completed through derivatives, we have created a look-through tool which allows us to footprint these positions. The result mimics the physical listed equity holding.

Term	Description
Discount rate	When comparing earnings in the future with earnings today, financial models apply a discount to earnings in the future to reflect that they are less certain and that there is value to having cash today, rather than prospect of cash in the future. The amount that earnings are discounted (each year) is called the discount rate. When earnings are less certain, for example because of climate-related risk, this can be adjusted by increasing the discount rate to reflect this extra risk.
Downstream Scope 3 emissions	Indirect carbon emissions related to sold goods and services.
Endowments	A characteristic of the Fund that provides the Guardians with a comparative advantage or edge over other investors. The Fund's four main endowments are a Long Investment Horizon, Operational Independence, Sovereign Status, and our Governance structure.
EVIC (enterprise value including cash)	The sum of the market capitalization of ordinary shares at financial year-end, the market capitalization of preferred shares at fiscal year-end, and the book values of total debt and minorities' interests. No deductions of cash or cash equivalents are made to avoid the possibility of negative enterprise values.
Fossil fuel reserves	This measures the carbon equivalent emissions stored in fossil fuel reserves that would be released if those fossil fuel reserves were produced and used in the future, relative to dollars invested. Fossil fuel reserves include thermal coal, gas and oil. In line with MSCI, fossil fuel reserves include: metallurgical coal, thermal coal, conventional oil, shale oil, oil shale & tar sands, natural gas, shale gas. MSCI ESG Research calculates the potential emissions should all fossil fuel reserves be produced and burnt expressed as metric tonnes of CO ₂ equivalent using the Potsdam Institute methodology. This includes proved and probable fossil fuel reserves.
Greenhouse gas	The greenhouse gases listed in the Kyoto Protocol: carbon dioxide (CO ₂); methane (CH ₄), nitrous oxide (N ₂ O), hydrofluorocarbons (HFCs), nitrogen trifluoride (NF ₃), perfluorocarbons (PFCs), and sulphur hexafluoride (SF ₆).
Information Ratio	A measurement of return per unit of risk.
Investment	An allocation of risk capital to a specific manager or activity.
Listed equities	A company is described as listed if its stock shares can be bought and sold through a public stock exchange. This asset class includes all on-balance sheet listed equity that is traded on a market and is for general corporate purposes. This may include listed NZ equities and listed global equities, and covers both active and passive listed physical equities.
Long position	In the context of derivatives, a long position is one in which the investor expects to make a gain if the price of the underlying asset rises.
Market capitalisation	Total market value of a company's outstanding shares.
Net neutral strategies	Refers to investment strategies where we expect to be long and/or short across a range of markets, regions and/or asset classes over interim periods, with positions expected to net to zero over time. Relevant strategies are excluded from the GHG Emissions Inventory.
Opportunity	Used by the Guardians to denote sub-asset classes: the basic building blocks of our Active Portfolio. This could be aligned with sectors, asset classes or more nuanced, custom investment concepts or strategies.

Term	Description
Passive management	Passive management, or 'index-tracking', involves constructing a portfolio that mirrors a selected market index. Assets (such as shares) are held in proportion to their weighting in the chosen index rather than through active investment decisions.
Project Finance	Financed emissions include all on-balance sheet loans or equities to projects or activities that are designated for specific purposes.
Reference portfolio	A notional portfolio of passive, low-cost, listed investments suited to the Fund's long-term investment horizon and risk profile. Capable of meeting the Fund's objectives over time, it has an 80:20 split between growth and fixed-income investments and its foreign currency exposures are 100% hedged to the New Zealand dollar. A key benchmark for the performance of the Actual Portfolio.
Risk budget	The average amount of active risk that is expected to be allocated to an opportunity. Risk budgets aggregate to the total active risk budget.
Short position	A short or short position is an investment strategy where an entity sells a security, currency or derivative with the view of buying back the same amount of the relevant instrument at a lower price. In the context of derivatives, a short position refers to a situation where the investor expects to make a gain if the price of the underlying asset decreases.
Sovereign Bonds (debt)	A debt security issued by a national government. This asset class includes sovereign bonds of all maturities issued in domestic or foreign currencies.
Synthetic portfolios	Obtaining exposures using derivatives. Generally does not require funding.
Unadjusted Reference Portfolio	The term 'Unadjusted Reference Portfolio' links back to the benchmark indices in use as the Fund's Reference Portfolio (see above) when we established our GHG emissions reduction targets in 2019-20. That benchmark comprised a combination of the MSCI All Country World Investable Market Index (ACWI IMI) and the NZX50. For our 2020-2025 GHG emissions method/targets and CVaR, we consider what those original benchmark indices own at each subsequent year end (30 June 2025 in this latest case) as the 'unadjusted Reference Portfolio' – as the baseline against which to compare performance of our Actual Portfolio on GHG metrics, targets – and for CVaR. For our 2025-2030 GHG emissions method/targets, we adopt those original benchmark indices as a fixed instance of the 'unadjusted Reference Portfolio' as at 30 June 2019 - for the purposes of a baseline against which to compare performance of our Actual Portfolio on GHG metrics and targets.
Unlisted	An unlisted security is a financial instrument that is not traded on a formal exchange. For example, unlisted equities include all on-balance sheet equity investments to businesses, nonprofits, and any other structure of organization that are not traded on a market and are for general corporate purposes, i.e., with unknown use of proceeds as defined by the GHG Protocol. This includes private equity investments.
Upstream Scope 3 emissions	Indirect carbon emissions related to purchased or acquired goods and services.

Annex A



Basis of preparation – current GHG emissions approach (2020-25)

ANNEX A: BASIS OF PREPARATION – CURRENT GHG EMISSIONS APPROACH (2020-25)

APPROACH

[applicable to Tables 2a. and 2b.]

The Fund continues to make reference to the GHG Protocol approach to measuring our emissions for FY2024-25, to ensure consistency with previous reporting periods and avoid introducing methodological changes which would have implications for tracking performance against our 2025 emissions reduction targets (established in 2020).

LISTED PORTFOLIO

We obtained MSCI ESG Research’s footprint calculations for the Fund’s actual listed equities (including active and passive listed physical equities, and passive equity derivative exposures) as at 30 June 2025.

Our equity derivative exposures were treated as equivalent in emissions intensity and fossil fuel reserves as their underlying physical equities equivalents, even though there is not necessarily any underlying holding of physical equities.

For our long holdings of listed equities, the MSCI ESG Research data covered 99.7% (by market value), compared with 99.6% in 2024, with 0.3% not attributable (0.4% in 2024). We did not have any short holdings of listed equities in scope of our current management criteria as at 30 June 2025.

Treatment of Short Positions: We use the ‘Carbon Net Financial Exposure Approach’ from the Institutional Investors Group on Climate Change to short positions, whereby the emissions and reserves from the long and short portfolios are netted off to show the Fund’s portfolio exposure to net carbon financial risk.¹

UNLISTED PORTFOLIO

Where carbon data is available, we obtain information on our unlisted assets directly from our external managers or asset operators. This year we were able to collect data from investees representing approximately 11% of the Fund’s total holdings by asset value.

1. https://139838633.fs1.hubspotusercontent-eu1.net/hubfs/139838633/Past_resource_uploads/IIGCC_Incorporating_Derivatives_May_2022.pdf

For the remaining unlisted assets where no data was available (2.8% total holdings by asset value), the emissions intensity and fossil fuel reserves are proxied. We proxied other unlisted timber assets (0.9%) based on Kaingaroa Timberland's FY2023 emission profile, and other assets using the Reference Portfolio's averages for the most relevant sector to the asset - as per the Global Industry Classification Standard (e.g. Real Estate).

When a holding is invested in multiple assets or when the underlying assets are not known, we proxy it against the overall average emissions intensity and fossil fuel reserves. We infer fossil fuel reserves, emissions intensity and revenue for individual assets by viewing them as some combination of equities and bonds/cash. We determine this mix from the proxy system used to control portfolio risk by the Asset Allocation team, thus ensuring consistency.

ASSETS EXCLUDED OR ASSUMED TO HAVE NIL EMISSIONS

Our bond investments are considered to have no carbon footprint (and no revenue) assigned. This is based on the market capitalisation approach as set out in TCFD guidance, where emissions are allocated based on equity ownership.¹

In this approach, bonds are not allocated fossil fuel reserves, emissions and revenue as there is no equity ownership. Additionally, equity positions taken as part of our strategic tilting programme and other market neutral strategies, as well as life settlements, natural catastrophe insurance, active collateral, currency exposure, and wireless spectrum (17.9% of the Fund in total) have been excluded from this analysis for the purpose of calculating carbon intensity (and they are treated as having a zero fossil fuel reserves for the purposes of our fossil fuel reserve calculation – see the Fossil Fuel Reserve Calculation section for further details).

We have excluded these as the strategies meet one of the following criteria: (1) they are net-neutral over the long-term; (2) the strategies are constructed of fixed income products, which our methodology does not attribute emissions to; or (3) the investment has no clear carbon footprint.

CALCULATION

Total portfolio foot-printing is a combination of our listed portfolio emissions (calculated by MSCI), obtained carbon data from unlisted assets, and proxy-based estimates. In calculating emissions, revenue and potential emissions from fossil fuel reserves in the listed portfolio, we assume that these are all attributable to equities and not fixed income or net neutral investments.

DATA AND DEFINITIONS

We use 'carbon' to refer to all major GHGs, collectively measured as metric tonnes of carbon dioxide equivalent (mTCO₂e).

Our calculated footprint only includes Scope 1 and Scope 2 emissions of the Fund's investees. Scope 3 emissions are not currently included in footprint calculations, other than for fossil fuel reserves, since Scope 3 data quality and estimation methodologies are still evolving.

- Scope 1 emissions are the direct emissions from a company's own production or controlled by the company. It includes emissions from combustion in the company's own boilers, furnaces and vehicles, as well as fugitive emissions.
- Scope 2 emissions are the emissions from the production of electricity, heat or steam used by that company (including the transmission and distribution losses associated with some purchased entities).
- Scope 3 emissions are the indirect emissions from the production of goods and services purchased by that company or other indirect emissions that occur from sources not owned or controlled by the company. It includes the emissions of contractors and other outsourced activities, such as third-party deliveries, business travel and the ultimate use of the product or service. Thus, it covers upstream and downstream emissions.²

The GHG Protocol provides guidance on appropriate source and use of global warming potential (GWP) rates and emission factors.³ MSCI considers the GHG Protocol as the basis of their foot printing calculations, including use of the GWP rates in their estimation of GHG emissions.⁴ MSCI applies emissions factors to estimate emissions based on available activity

1. <https://www.tcfhub.org/wp-content/uploads/2022/04/Table-3.pdf>

2. MSCI ESG Research

3. GHG Protocol - Inventory Guidance (https://ghgprotocol.org/sites/default/files/Guidance_Handbook_2019_FINAL.pdf)

4. MSCI ESG Research, formulas for carbon metrics (<https://www.msci.com/www/research-paper/carbon-footprinting-101-a/0229050187>)

data. These emissions factors are typically derived from relevant authoritative sources such as the Intergovernmental Panel on Climate Change (IPCC), US Environmental Protection Agency, etc.¹

FOOTPRINT TARGET METRICS REPORTED²

Emissions Intensity: measured $\text{mTCO}_2\text{e} / \text{US\$m sales}$ = metric tonnes of carbon emissions divided by US\$ million of company sales. This measures the portfolio in terms of carbon emissions per unit of output and provides a measure of the overall efficiency of the portfolio by comparing emissions to the economic activity that produces them. This metric is not as impacted by shifts in market valuations as approaches that measure emissions per dollar invested. The emissions/sales data of listed equities is derived from MSCI.

Potential Emissions: measured $\text{mTCO}_2\text{e} / \text{US\$m invested}$ = metric tonnes of carbon emissions divided by \$US million invested. This measures the carbon equivalent emissions stored in fossil fuel reserves that would be released if those fossil fuel reserves were produced and used in the future, relative to dollars invested. Fossil fuel reserves include thermal coal, gas and oil. MSCI ESG Research calculates the potential emissions should all fossil fuel reserves be produced and burnt expressed as metric tonnes of CO_2 equivalent using the Potsdam Institute methodology. This includes proved and probable fossil fuel reserves.

Fossil Fuel Reserves: For listed holdings, fossil fuel reserves data is received from MSCI. For our unlisted assets, we request that they report their fossil fuel reserves. Given our knowledge of the unlisted assets that report on their footprint, if they do not report, we assume that they own no fossil fuel reserves.

For assets with proxy-based estimates, we assumed that a company has no fossil fuel reserves unless it is proxied against the overall category rather than a specific category (because we have deeper knowledge of these investments). In the latter case, fossil fuel reserves are proxied using the average fossil fuel reserves for our unadjusted Reference Portfolio, which was calculated by MSCI.

Portfolio footprints have been reported in US\$ terms to facilitate easier comparison both over time and to other international funds.

1. MSCI ESG Research (2023). *ESG Climate Change Metrics - Methodology and definitions* (<https://support.msci.com/support/methodologies/climate-change-metrics/03553936309>)

2. MSCI ESG RESEARCH DATA IS SUBJECT TO TIMING LAGS MEANING DATA INCLUDED IN THE FOOTPRINT CALCULATIONS MAY NOT DIRECTLY CORRELATE TO OUR 30 JUNE YEAR END.

Annex B



Basis of preparation – revised GHG emissions approach (2025-)

ANNEX B: BASIS OF PREPARATION – REVISED GHG EMISSIONS APPROACH (2025-)

[applicable to Tables 3-8]

1. INTRODUCTION

This Basis of Preparation (BOP) describes the methods, rationale, assumptions and limitations involved in measuring the financed greenhouse gas (GHG) emissions of the New Zealand Super Fund (NZSF) investment portfolio. The GHG Emissions Inventory of the NZSF - including the BOP - is externally published in the annual NZSF Climate Change Report in Q4 of each year.¹ This BOP applies to the GHG Emissions Inventory of the NZSF from 1 July 2025 onwards.

2. SCOPE AND STANDARDS

2.1 SCOPE

This BOP covers the Guardians' Scope 3; Category 15 GHG emissions – arising from the underlying securities and investee companies in the NZSF. Under the GHG Protocol Value Chain (Scope 3) Accounting and Reporting Standard, these emissions are described as the *'operation of investments (including equity and debt investments and project finance) in the reporting year, not included in scope 1 or scope 2'*.²

Avoided emissions and emissions removals are not in the scope of this inventory or any GHG-related metric and targets.

Operational GHG emissions associated with the Guardians as an entity lie outside of scope. Specifically, the Scope 1, 2 and 3 operational emissions arising from the Guardians' service functions (investment management, fund administration, etc.) are calculated and disclosed separately in the Guardians' Annual Report.³

1. NZ Super Fund Climate Change Report 2024 [<https://nzsuperfund.nz/assets/Publications/Annual-Reports/NZ-Super-Fund-Climate-Change-Report-2024.pdf>]

2. *Corporate-Value-Chain-Accounting-Reporting-Standard_041613_2.pdf*

3. *NZ Super Fund - Annual Report*

2.2 STANDARDS APPLIED

The GHG Emissions Inventory for the NZSF is calculated using the **Management Criteria** as set out in this BOP. The standards used as a basis to develop our Management Criteria include the World Resources Institute and World Business Council for Sustainable Development's Greenhouse Gas Protocol standards and guidance (collectively, the 'GHG Protocol').¹

Specifically, our Management Criteria is based on elements of the following standards:

- GHG Protocol: A Corporate Accounting and Reporting Standard (revised edition).
- GHG Protocol: Corporate Value Chain (Scope 3) Accounting and Reporting Standard.
- Partnership for Carbon Accounting Financial (PCAF): The Global GHG Accounting Reporting Standard Part A: Financed Emissions, Second Edition. (PCAF, 2022).²

We do not fully comply with the PCAF standards but have used these as a basis to develop our Management Criteria as shown in **Table 2.1**.

Table 2.1: PCAF standards applied to measuring financed emissions of the NZSF

Asset class	Standard considered	Comment
Listed equities	PCAF Chapter 5.1	Including active and passive listed physical equities. PCAF does not cover special cases of underwriting such as Initial Public Offering underwriting.
Corporate Bonds (listed)	PCAF Chapter 5.1	PCAF does not include bonds with a specific purpose (such as a green bond). Although green and/or social corporate bonds are excluded from PCAF Chapter 5.1, for some investments we are not able to distinguish if the bond is a special purpose bond. In these instances, the methodology for corporate bonds applies.
Unlisted assets	PCAF Chapter 5.2	Includes private equity assets and business loans (corporate credit).
Sovereign Bonds	PCAF Chapter 5.7	PCAF does not include sub sovereign and supranational bonds.
Commercial real estate	PCAF Chapter 5.4	This asset class captures unlisted assets such as hotels. Property investments listed on the stock market are classified as listed equity (i.e. listed property).

1. [Homepage](#) | GHG Protocol

2. PCAF (2022). *The Global GHG Accounting and Reporting Standard Part A: Financed Emissions. Second Edition*.

2.3 DEVIATIONS FROM STANDARDS

For some areas, the Guardians have determined that it is not feasible or practical to fully align with the PCAF standards – especially where methodologies for some asset classes are not well established. These deviations and our corresponding rationales are summarised in **Table 2.2**.

Table 2.2: Key deviations from the PCAF standards for the NZSF

Aspect	NZSF approach	Rationale
Derivatives (not covered by PCAF) (<i>see below for more information</i>)	Include listed equity, listed corporate bond and sovereign bond derivatives; treat as physical equivalents using exposure (notional/delta-adjusted) and net longs/shorts where applicable. Exclude other derivatives and strategies deemed net neutral over time.	• PCAF does not cover short and long positions / derivatives. • Derivatives have been included in our 2019 emission reduction targets and have previously been measured.
Cash assets (not included in PCAF)	For some unlisted investments we include cash	• For certain investments it is not possible to distinguish and confirm the asset class for the cash component.
Corporate and sovereign bonds (PCAF requires the nominal value of the bond to be used)	Use the market value of the bond	• We use data that is available and consistent with our financial valuation of an investment.
Commercial real estate (PCAF requires the property value at the year of loan origination)	Use the property value at the financial year end, updated annually as per our Valuation Policy	• We align with NZSF financial valuation basis. Origination values are not consistently accessible.
Unlisted investments (PCAF requires total equity plus debt) to be used as the value of the investment	Use the Net Asset Value for the investment at 30 June.	• Alignment with NZSF valuation basis and data availability.

2.4 DERIVATIVE EXPOSURES

Using derivatives allows the Fund to enter into agreements to either buy or sell an underlying asset at a predetermined price and future date, without directly owning it.

PCAF does not currently provide a widely accepted standard for apportioning emissions associated with derivatives.

To account for selected derivative GHG emissions, we have opted to align with our financial reporting approach. This means we calculate the total longs held and the total shorts held and net them ('net neutral'). We include derivatives associated with listed equity, listed corporate bonds, and sovereign bonds. All other derivatives are excluded. We also exclude derivatives we deem to be net neutral (see glossary).

- For listed equity and corporate bonds, we use the same denominators as for listed equities: Enterprise Value Including Cash (EVIC) and revenue for equity and credit positions (excluding sovereign bonds).
- For sovereign bonds we use the same World Bank Gross Domestic Product (GDP) adjusted for Purchasing Power Parity (PPP) using 2021 International \$.

We are aware of emerging guidance from bodies such as the Institutional Investors Group on Climate Change. However, as a globally accepted standard does not yet exist, we will continue to monitor evolving best practice for measuring and reporting GHG emissions on derivative positions and may adjust our approach in the future.

2.5 BASELINE AND ACCOUNTING PERIOD

The GHG Emissions Inventory is calculated in line with the NZSF financial accounting cycle. This means the inventory is calculated annually and covers the 12 months included within the Financial Year ending 30 June (i.e. 1 July to 30 June inclusive).

The GHG Emissions Inventory is based on data available at the time of preparation, reflective of the Fund's financial year end. Due to delays between an investee reporting their GHG emissions and our inventory being calculated, disclosures may include data from outside of the financial year (see Section 9).

The GHG emissions baseline year under this Management Criteria is FY2025 (i.e. 30 June 2025). N.B. This is distinct from the benchmark year established for our 2030 GHG emissions reduction targets (30 June 2019).

2.6 RESTATEMENTS AND RECALCULATIONS APPROACH

Management will apply reasonable endeavours to restate or recalculate the baseline year and - if it is considered beneficial to users understanding- subsequent years' GHG emissions inventories, where:

- we identify material errors, omissions, or misstatements in data or calculations;
- we elect to apply material changes in standards or methodologies;
- new asset classes are included (baseline set at first year of inclusion);
- practical (see below).

'Material' is taken as issues affecting $\geq 5\%$ total portfolio emissions.

Management will not restate or recalculate the baseline year and subsequent years' GHG emissions inventories where this is considered impractical or unreasonable, such as when:

- accurate, complete and/or comparable historical data is unavailable, based on reasonable endeavours (e.g. using our existing third-party data service providers);
- such endeavours would require disproportionate amount of Guardians' resources, and/or ;
- to account for organic growth or decline of the Fund.

The scope, rationale and any associated implications of restatement will be disclosed.

3. ASSET CLASS INCLUSIONS AND EXCLUSIONS

3.1 ASSET CLASS INCLUSIONS

Whilst emissions from most asset classes have been measured since 2019, new asset classes have been added as at 30 June 2025, as part of the transition to new Management Criteria.

Table 3.1 outlines the asset classes included in the GHG financed emissions inventory, and associated commentary. Although cash assets are typically excluded, where we are not able to distinguish whether an investment includes cash, some cash assets may be included.

Table 3.1: Asset classes included in the NZSF's GHG Emissions Inventory

Asset classes included in the GHG inventory	Comments
Listed equities (includes listed property)	Includes equity exposures gained via derivative positions.
Listed Corporate Bonds	Includes corporate bond exposures gained via derivative positions.
Sovereign Bonds	Includes sovereign bond exposures gained via derivative positions.
Unlisted assets (private equity; business loans)	
Commercial real estate (unlisted)	

Green and/or social bonds are typically excluded. However, for some investments we are not able to distinguish if the bond is a special purpose bond hence these may be included. In these instances, the methodology for corporate bonds applies.

3.2 ASSET CLASS EXCLUSIONS

Table 3.2 outlines the asset class exposures excluded from the financed GHG Emissions Inventory for one or more of the following reasons:

- there is no global methodology to quantify the financed emissions of these asset classes.
- we are not able to extract these asset classes separately within our holdings database
- the individual activities are insignificant (i.e. <5%) to NZSF's total estimated financed GHG emissions.
- Investments are considered net neutral over the long term. Including such positions could introduce undesirable short-term fluctuations which could obfuscate the more material long-term trends. Given these factors, it would not be a fair reflection of GHG emissions exposure of the portfolio to include net neutral positions in an annual inventory.

Table 3.2: Asset classes excluded from the NZSF GHG Emissions Inventory

Asset classes excluded from GHG inventory	Comments
Strategic tilting and selected derivatives - Positions taken as part of Strategic Tilting. - Short-term derivative positions and other derivatives not included above.	The activities are insignificant (i.e. <5%) to NZSF's total anticipated financed GHG emissions. A value-adding strategy that seeks to exploit differences between an asset's market price and its fundamental long-term value. Our strategic-tilting program is intended to be net neutral over the long-term and fluctuates significantly over any given period. Due to the fluctuation and the short-term nature of the positions, this asset class is excluded from the GHG Emissions Inventory.
Private credit: Off-balance sheet loans and lines of credit (and therefore have no present investment value)	These assets are off balance sheet and therefore have no present investment value.
Selected corporate bonds: Business bonds and loans with specific corporate purposes (e.g. a green loan or green bond)	There is no global methodology to quantify the financed emissions associated with bonds and loans with specific purposes (e.g. green bonds). For some investments we are not able to distinguish if the bond is a special purpose bond. In these instances, the methodology for corporate bonds applies.
Unlisted corporate bonds	As of 30 June 2025, we did not hold any investments in this asset class.
Selected commercial real estate - Loans for construction and renovation. - Financed construction emissions	There is no global methodology to quantify the financed emissions of these asset classes.
Sovereign bonds - Sub sovereign bonds (e.g. municipal) - Supranational bonds (where the country of issue cannot be identified)	There is no global methodology to quantify the financed emissions of these asset classes.
Other	There is no global methodology to quantify the financed emissions for some of these other asset classes, including: • Natural catastrophe insurance: <i>Involves the purchase of natural catastrophe linked bonds and other products.</i> • Active collateral: <i>Cash and non-cash assets pledged as collateral.</i> • Wireless spectrum: <i>A tactical opportunity within private equity and unconsolidated subsidiaries in the telecommunications sector.</i> • Global Macro: <i>A market-neutral strategy that produces return by exploiting inefficiencies within and across a broad range of liquid markets. .</i> • Tactical Credit Opportunities: <i>Short-term credit positions.</i>

Asset classes excluded from GHG inventory	Comments
	Carbon credits
Cash, currency exposure and tax credits/liabilities	Some cash investments are not excluded in commercial real estate, and unlisted investments due to the inability to isolate the asset class at this granular level.
Project finance	The activities are insignificant (i.e. <5%) to NZSF's total anticipated financed GHG emissions.

4. CONSOLIDATED APPROACH

In line with the PCAF standards, the asset class methodologies are used to calculate the Scope 3 category 15 emissions from financial investments. The GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard presents three consolidation approaches when preparing GHG emission inventories.¹

To deliver consistency, we use a **control approach**. This means that emissions from NZSF loans and investments are reported as financed emissions under the Scope 3 category 15 (investments), as defined by the GHG Protocol Value Chain (Scope 3) Accounting and Reporting Standard.² As the Guardians owns an interest in an investment, but does not have operational control, we do not account for GHG emissions using the operational control approach. Accordingly, an investment's operational emissions are not included as part of the Guardians' scope 1 and 2 emissions.

We adopt the **financial control approach**. This means we report the emissions for the investments in NZSF based on the fact NZSF has the potential to benefit economically from the issuer's activities. Using the **financial control approach** allows the Guardians to define organisational boundaries for the purposes of carbon accounting and report the GHG financed emissions from its investments as Scope 3, Category 15. This approach allows us to report emissions according to NZSF's relative share of ownership. For consistency with our financial reporting (investment entity) approach, we treat all investments as Category 15 regardless of our level of ownership.

For the purposes of GHG emissions accounting, we do not consolidate our investments. Investments are calculated at the asset class level in line with PCAF. NZSF investments are assessed using their fair value and reflected on the balance sheet as separate assets.

Further, to apply consistency with financial accounting judgments, where we own more than a 50% share in an investment, we also consider them using the financial control approach for the purposes of carbon accounting.

For investments where we own more than a 50% share, our key role is as shareholder/investor. There are governance frameworks in place (including the Statement of Investment Policies Standards and Procedures) which mean that although we may acquire a controlling interest in direct assets, the investee retains operational independence from the Guardians and the NZSF is not directly involved in the management of investment.³

1. [Corporate Standard | GHG Protocol](#)

2. [Corporate Value Chain \(Scope 3\) Standard | GHG Protocol](#)

3. [Statement of Investment Policies Standards and Procedures - VCF \[CD00044\].pdf](#)

5. EMISSIONS METRICS AND DEFINITIONS

The key metrics we measure as part of the GHG Emissions Inventory are outlined below.

5.1 LISTED EQUITIES

Table 5.1: Metrics for listed equities and equity derivative exposures¹

Metric	Outstanding amount (numerator)	Company value (denominator)
Scope 1 and 2 (mTCO2e) Sum of absolute gross scope 1 and 2 greenhouse gas emissions associated with NZSF investment portfolio.	Outstanding amount invested based on market value as at end of the FY	EVIC ²
Scope 3 (mTCO2e) Absolute gross scope 3 greenhouse gas emissions associated with NZSF investment portfolio.	Outstanding amount invested based on market value as at end of the FY	EVIC
Carbon footprint (mTCO2e / NZ\$M total invested) Total carbon emissions for a portfolio normalized by the market value of NZSF investment portfolio. $\text{Economic emission intensity} = \sum_i \frac{\text{Outstanding amount}_i}{\text{Investee company's EVIC}_i} \times \text{Investee company's emissions}_i$ $\text{Total outstanding amount or assets under management (AuM)}$	Scope 1 and 2 emissions as per above	Current investment portfolio value (NAV, NZ\$M) for this asset class as at end of FY ³ For derivatives we use the equivalent exposure amount.
*Carbon intensity (mTCO2e / US\$M sales) Volume of carbon emissions per million dollars of revenue (carbon efficiency of a portfolio) ⁴	Scope 1 and 2 emissions	Total sales (US\$M)
*Potential emissions from fossil fuel reserves (mTCO2e / US\$M NAV) The equivalent emissions stored in fossil fuel reserves that would be released if these reserves were produced and used in the future based on the current portfolio value.	Outstanding amount in the reserve based on market value as at end of the FY	Current investment portfolio value US\$M (for Fossil Fuel Reserves)
*existing metric and metric used for emissions reduction targets		

1. E09 - Carbon Footprinting - metrics.pdf

2. For derivatives, we adopt EVIC over revenue denominators, when computing intensity metrics for equity and credit positions.

3. For derivatives we use the exposure value as this provides a more comparable value to the NAV.

4. No adjustments for fluctuations in EVIC are made.

5.2 CORPORATE BONDS (LISTED)

Table 5.2: Metrics for corporate bond exposures and listed corporate bond derivatives

Metric	Outstanding amount (numerator)	Company value (denominator)
Scope 1 and 2 (<i>mTCO2e</i>) Sum of absolute gross scope 1 and 2 greenhouse gas emissions associated with NZSF investment portfolio	The market value of the debt as at end of the FY (NAV).	EVIC (listed issuers)
Scope 3 (<i>mTCO2e</i>) Absolute gross scope 3 greenhouse gas emissions associated with NZSF investment portfolio ¹	The market value of the debt as at end of the FY (NAV).	EVIC (listed issuers)
Carbon footprint (<i>mTCO2e/NZ\$M total invested</i>) Total carbon emissions for a portfolio normalized by the market value of NZSF investment portfolio	Scope 1 and 2 emissions as per above	Current investment portfolio value (NZ\$M) for this asset class as at end of FY ^{2,3} For derivatives we use the equivalent exposure amount.
Carbon intensity (<i>mTCO2e/US\$M sales</i>) Volume of carbon emissions per million dollars of revenue (carbon efficiency of a portfolio) ⁴	Scope 1 and 2 emissions	Total sales (US\$M)
Potential emissions from fossil fuel reserves (<i>mTCO2e / US\$M NAV</i>) The equivalent emissions stored in fossil fuel reserves that would be released if these reserves were produced and used in the future based on the current portfolio value.	Tonnes of equivalent carbon emissions	Current investment portfolio value US\$M (for Fossil Fuel Reserves)

1. Includes all available data. Sector specific breakdowns are not monitored or disclosed.

2. To calculate the footprint, our third-party data provider uses the notional value of the bond as the outstanding amount. However, the Fund uses the market value of the bond at the time of the report. We chose this because it aligns with the valuation the Fund has for the investment.

3. For listed corporate bond derivatives we use the exposure value as this provides a more comparable value to the NAV.

4. No adjustments for fluctuations in EVIC are made.

5.3 UNLISTED ASSETS (PRIVATE EQUITY AND BUSINESS LOANS)

Table 5.3: Metrics for unlisted asset exposures (including private equity and business loans)

Metric	Outstanding amount (numerator)	Company value (denominator)
Scope 1 and 2 (mTCO2e): Sum of absolute gross Scope 1 and 2 GHG emissions associated with NZSF investment portfolio $\text{Financed emissions} = \sum_c \text{Attribution factor}_c \times \text{Company emissions}_c$ (with c = borrower or investee company)	For business loans: - the value of the debt the issuer owes NZSF (i.e., disbursed debt minus any repayments) as at the financial year end (i.e. will decline to zero at loan end). For unlisted equity: - the outstanding value of equity NZSF holds in the private company at the financial year end. It is calculated by multiplying the relative share of the financial institution in the respective investee by the total equity of the respective issuer according to its balance sheet at the FY year end.	For business loans to listed companies: - EVIC For unlisted equity: - Net Asset Value for the company
Scope 3 (mTCO2e): Absolute gross Scope 3 GHG emissions associated with NZSF investment portfolio ¹	As per Scope 1 and 2 above	As per Scope 1 and 2 above.
Carbon footprint (mTCO2e / NZ\$M total invested): Total emissions for a portfolio normalized by the market value of NZSF investment portfolio	Scope 1 and 2 emissions as per above	Current investment portfolio value (NZ\$M)
Carbon intensity (mTCO2e / US\$M sales): Volume of emissions per million dollars of revenue (carbon efficiency of a portfolio) ²	Scope 1 and 2 emissions	Total sales (US\$M)
Potential emissions from fossil fuel reserves (mTCO2e / US\$M NAV): The equivalent emissions in reserves that would be released to atmosphere if these reserves were produced and used in the future, based on the current portfolio value	Tonnes of equivalent carbon emissions	Current investment portfolio value US\$M (for Fossil Fuel Reserves)

1. Includes all available data. Sector specific breakdowns are not monitored or disclosed.

2. No adjustments for fluctuations in EVIC are made.

5.4 COMMERCIAL REAL ESTATE

Table 5.4: Metrics for commercial real estate

Metric	Outstanding amount (numerator)	Company value (denominator)
Scope 1 and 2 (<i>mTCO2e</i>) Absolute scope 1 and 2 emissions related to the energy use of financed buildings during their operation and held within the NZSF investment portfolio ¹	Outstanding investment amount (% ownership)	Latest property value at financial year end date ²
Carbon footprint (<i>mTCO2e/NZ\$M total invested</i>) Total carbon emissions for a portfolio normalized by the market value of NZSF investment portfolio.	Scope 1 and 2 emissions as per above	Current investment portfolio value (NZ\$M) (for this asset class as at end of FY)

1. Energy use includes the energy consumed by the building's occupant and shared facilities.

2. We are not able to fix this as the property value at loan or equity origination, instead we use the property valuation that is updated annually as per our Valuation Policy and Procedure.

5.5 SOVEREIGN BONDS

Table 5.5: Metrics for sovereign bonds (inc. sovereign bond exposures gained via derivative positions)

Metric	Outstanding amount (numerator)	Value (denominator)
Scope 1 (<i>mTCO2e</i>) These are the absolute GHG emissions from sources located within the country territory.	Scope 1 emissions (taken from the EDGAR database) ¹	Market value of the bond. ² For derivatives, we use the equivalent exposure amount.
Scope 1 – Production emissions (<i>mTCO2e</i>) Production emissions are emissions attributable to emissions produced domestically and include domestic consumption and exports. Production-based emissions are estimated according to the residence principle. They refer to the GHG emitted from the resident economic activities and households of a country.	Production emissions (taken from the OECD database)	Market value of the bond. For derivatives we use the equivalent exposure amount.
Scope 1 – Consumption (demand side) emissions (<i>mTCO2e</i>)	Consumption (demand) emissions (taken from the OECD database)	Market value of the bond.

Metric	Outstanding amount (numerator)	Value (denominator)
Consumption emissions represent the demand side of sovereign emissions, capturing consumption patterns and trade effects. This metric provides a broader view of a sovereign's GHG emissions and addresses carbon leakage that arises due to offshore shifts in production from countries where goods and services are consumed. Demand-based emissions encompass GHG emissions from a country's resident households, as well as direct and indirect upstream emissions from their consumption of finished goods and services.		For derivatives we use the equivalent exposure amount.
Carbon footprint (mTCO2e/NZ\$M total invested): The absolute domestic GHG emissions from sources located within a country by the NZD\$ million invested	Scope 1 emissions as per above (using EDGAR emissions)	Current investment portfolio value (NZ\$M) (for this asset class as at end of FY) ³
Carbon intensity for sovereign production emissions (mTCO2e / PPP adjusted GDP 1\$M): Production emissions per \$1M GDP-PPP adjusted	Production emissions (using OECD production emissions)	GDP-PPP adjusted. (uses the international \$).
Carbon intensity for sovereign consumption (demand side) emissions (mTCO2e / capita): Consumption emissions per capita	Consumption emissions (using OECD final demand emissions)	Population per country.

1. Emissions Database for Global Atmospheric Research (EDGAR)
2. Note PCAF requires nominal value, however, as market value is tracked by the Fund as part of Net Asset Value, we use this instead
3. For sovereign bond derivatives we use the exposure value as this provides a more comparable value to the NAV.

6. EMISSIONS ATTRIBUTION FACTORS

Attribution is based on the annual emissions of the issuer. This represents NZSF's share of emissions in relation to its proportional holdings exposure - relative to the total value of the issuer (company, country, asset).

NZSF accounts for the share of the annual emissions of the issuer based upon the ratio between the institution's outstanding amount (numerator) and the value of the issuer (denominator).¹ This ratio is called the **attribution factor**.

The attribution factor is typically calculated by determining the share of the outstanding amount of loans and investments of NZSF, over the total equity and debt of the issuer (company, asset, etc.).

Figure 6.1: General approach to calculating financed emissions (as per PCAF)

$$\text{Financed emissions} = \sum_i \underbrace{\text{Attribution factor}_i}_{\frac{\text{Outstanding amount}_i}{\text{Total equity} + \text{debt}_i}} \times \text{Emissions}_i$$

(with i = borrower or investee)

We have deviated from PCAF for some attribution factors owing to data availability and our preference to align with our financial valuation approach. Our approach for each asset class is outlined in **Table 6.1**, including alignment or deviation from PCAF. This will be reviewed and addressed annually in line with our restatement and recalculations approach (Section 2.6).

Our derivative exposures for listed equities, sovereign bond and corporate bonds are treated as per their physical equivalents.

Table 6.1: Attribution factors used by asset class exposure

Asset class	Attribution Factor
Listed equities (includes active and passive listed physical equities and listed property) Includes listed equity derivatives	We use: $\text{Attribution factor}_c = \frac{\text{Outstanding amount}_c}{\text{Enterprise Value Including Cash}_c}$ With c = investment (such as a listed company).

1. PCAF (2022). *The Global GHG Accounting and Reporting Standard Part A: Financed Emissions. Second Edition.*

Asset class	Attribution Factor
	The outstanding amount for listed equities is taken as: (number of shares x price) + the net long/short exposure of the derivatives (based on notional values) and options (based on delta-adjusted values). This is obtained through internal databases and is linked to our NAV. EVIC is provided by our third-party data provider. We then calculate the financed emissions using this formula: $\text{Financed emissions} = \sum_c \frac{\text{Outstanding amount}_c}{\text{Enterprise Value Including Cash}_c} \times \text{Company emissions}_c$
Unlisted assets - loans to private companies	For unlisted loan investments, the attribution factor is the outstanding value of the loan, using our Net Asset Value (NAV) divided by the total Company Valuation as of 30 June. $\text{Attribution factor}_c = \frac{\text{Outstanding Loan Value (NAV)}_c}{\text{Company Valuation as at 30 June } c}$ With c = investment (such as private loan investment) The outstanding amount is the value of the loan recognised at the amortised cost (i.e. outstanding principal with interest). With c = investment (such as private equity investment) This is a deviation from PCAF, which requires the denominator to be total equity and debt. We chose this because it aligns with the valuation the Fund has for the investment.

Asset class	Attribution Factor
	$\text{Attribution factor}_c = \frac{\text{Outstanding amount}_c}{\text{Total equity} + \text{debt}_c}$
Unlisted assets - equity investments in private companies	For unlisted equity investments, the attribution factor is the share of our investment (using our NAV), divided by the total Company Valuation as of 30 June (this is akin to the percentage ownership in the investment). $\text{Attribution factor}_c = \frac{\text{Our share of the investment (NAV)}}{\text{Company Valuation as at 30 June } c}$ With c = investment (such as private equity investment) We chose this because it aligns with the valuation the Fund has for the investment. This is a deviation from PCAF which requires the following: $\frac{\# \text{ shares of financial institution}_c}{\# \text{ total shares}_c} \times \text{Total equity}_c$
Corporate Bonds (listed) Includes listed corporate bond derivatives.	For listed bonds, the outstanding amount is the value of the bond based on the market value of the bond (based on NAV) (for both corporate listed bonds and corporate listed bond derivatives). $\text{Attribution factor}_c = \frac{\text{Outstanding amount}_c}{\text{Enterprise Value Including Cash}_c}$ With c = investment (e.g., listed corporate bond issuer)

Asset class	Attribution Factor
	EVIC is provided by our third-party data provider. We then calculate the financed emissions using this formula: $\text{Financed emissions} = \sum_c \frac{\text{Outstanding amount}_c}{\text{Enterprise Value Including Cash}_c} \times \text{Company emissions}_c$
Sovereign Bonds Includes exposures through sovereign bond derivatives.	$\text{Attributed Emissions} = \frac{\text{Exposure to Sovereign Bond (USD)}}{\text{PPP-adjusted GDP (international USD)}} \times \text{Sovereign Emissions (tCO}_2\text{e)}$ For exposure to sovereign bonds, we use the market value of the bond at the as of 30 June. For derivative exposures we use the equivalent exposure amount. We chose to deviate from PCAF to align with the valuation the Fund has for the investment. We use the World Bank sourced PPP-adjusted GDP (current international \$)¹
Commercial real estate	For commercial real estate, attribution is based on the share invested. For the attribution factor, we use the outstanding amount, based on the latest investment value divided by the latest property value of the building. $\text{Outstanding Amount} = \frac{\text{Latest Investment Value (NAV) as at 30 June}}{\text{Latest Property Value of the Building}}$ This is in line with PCAF standards, which notes the property value at origination is not always readily available. However, unlike PCAF, we update the property value in line with our Valuation Policy and Procedure, and the property value changes every year. This deviates from PCAF which states that the financial institutions shall fix this value for the following years of GHG accounting, i.e. the denominator remains constant from the first year of GHG accounting onward.

Asset class	Attribution Factor
	$Attribution\ factor_b = \frac{Outstanding\ amount_b}{Property\ Value\ at\ origination_b}$ (with $b = building$) We chose to deviate from PCAF so we can align with the valuation the Fund has for the investment.

1. [GDP, PPP \(current international \\$\) | Data](#)

7. GHG EMISSIONS DATA SOURCES

The GHG Emissions Inventory relies on a range of third-party data sources with supporting methodologies, as described in **Table 7.1**.

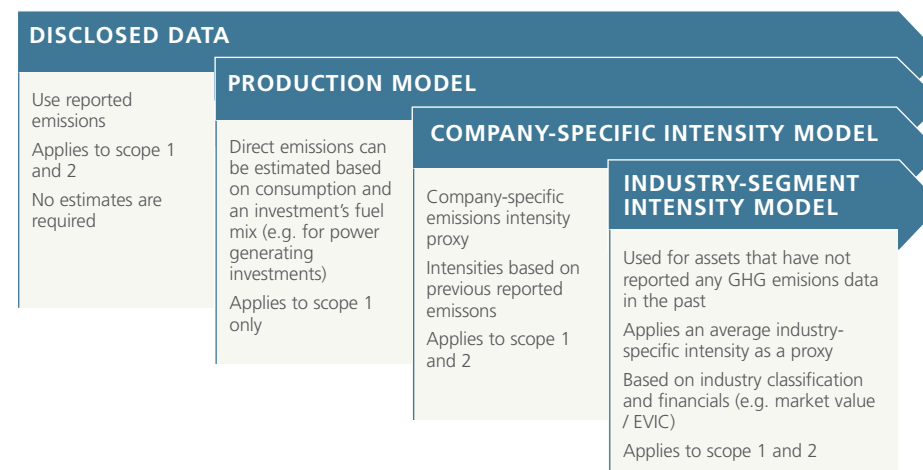
Table 7.1: Key GHG emissions data sources

Asset class	GHG emissions data provider
Listed equities including listed property and equity exposures gained via derivative positions	Our third-party data provider (MSCI) provides a mix of actual and estimated EVIC, GHG emissions and fossil fuel reserve data collected from companies in their coverage universe. Data is collected once per year from most recent corporate sources, including annual reports, sustainability reports, or websites. Other sources include the CDP database or government databases.
Corporate Bonds to listed issuers (includes exposures gained via derivative positions)	
Unlisted investments (includes private equity, business loans and commercial real estate)	Our managers work with our assets to obtain GHG emissions data. For some direct investments we obtain the data directly. For unlisted investments, GHG emissions data is obtained directly from the investment on an annual basis (as of 30 June 20YY or the most recent quarter end available). If an asset's reporting does not align with the GHG Protocol framework or does not represent emissions across all its geographies and operations, MSCI estimates GHG emissions. MSCI provides estimated emissions for our unlisted assets where information has not been reported. MSCI does not footprint forestry assets, so for these we use proxy data (refer below).
Sovereign bonds (including exposures gained via derivative positions)	We use a variety of sources such as EDGAR, the OECD and the World Bank. Refer below for further details.

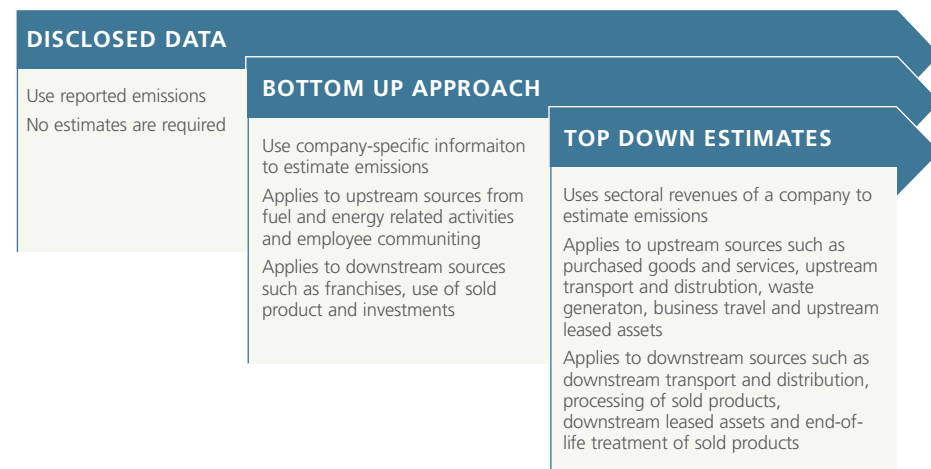
7.1 GHG EMISSIONS ESTIMATES - LISTED AND UNLISTED (EX. SOV BONDS)

MSCI provides estimates for GHG emissions where the reported data does not align with the GHG Protocol, or data is absent. This applies to listed equities, unlisted investments, and corporate bonds. The use of estimates does not apply to the sovereign bond asset class.

The data estimation hierarchy applied by MSCI for **Scope 1 and 2 emissions** data is as follows:



Scope 3 data availability is limited and when available it is often incomplete, inconsistent and volatile. The data estimation hierarchy applied by MSCI for **Scope 3 emissions** data is as follows:



7.2 GHG EMISSIONS ESTIMATES DERIVED INTERNALLY (UNLISTED INVESTMENTS)

MSCI's Private-i platform (formerly 'Burgiss') does not footprint forestry assets. This leaves us with two options for proxying the footprint.

- Option 1: Treat the assets as companies and assign a GICS sub-industry code. The most relevant would be 15105010, Forest Products.
- Option 2: Proxy the emissions with an individual comparable investment.

Given the breadth of investment types in the General Industry Classification System (GICS) sub-industry code (which include timber tract operations, forest nurseries, and manufacturers of lumber and plywood for the building industry such as wood panels), it was deemed preferable that we use Option 2 for proxying of forestry assets.

Our investment in Kaingaroa Timberlands (KT) is our preferred asset for proxying the other forestry assets. This is because we have worked with KT to measure their GHG emissions over many years, so have a greater understanding of their systems and processes. Additionally, KT activities are reasonably comparable to other Forestry assets in the NZSF. As such, the emissions from KT are used as a proxy for emissions from our other forestry assets.

7.3 GHG EMISSIONS ESTIMATES - SOVEREIGN BONDS

Key data sources available to assist with the GHG Emissions Inventory for sovereign bonds include:

Source	Link	Most recent data
Emissions Database for Global Atmospheric Research (EDGAR) EDGAR ¹ is a multipurpose, independent, global database of anthropogenic emissions of greenhouse gases on Earth. We use EDGAR to provide the Scope 1 GHG emissions for our sovereign bond portfolio.	EDGAR - The Emissions Database for Global Atmospheric Research	2023
OECD Greenhouse Gas Footprints (GHGFP): Principal indicators Production-based emissions and consumption (demand-based) emissions.	OECD Data Explorer • Greenhouse Gas Footprints (GHGFP): Principal indicators	2020
OECD Greenhouse Gas Footprints (GHGFP): Principal indicators Population data per country available for 56 countries.	OECD Data Explorer • Historical population data	2022
World Bank – GDP-PPP adjusted (international \$, 2021) Provides the GDP PPP figures needed for the sovereign bond GHG emissions footprint.	GDP, PPP (current international \$) Data	2021

1. Crippa, M. et al., 2024. GHG emissions of all world countries (<https://publications.jrc.ec.europa.eu/repository/handle/JRC138862>)

7.4 FINANCIAL DATA SOURCES

To calculate the GHG Emissions Inventory we use financial data in the form of an issuer valuation and the investment value (NAV). The sources of this data are described below.

Listed investments – Financial data (excluding sovereign bonds)

Valuations (e.g., EVIC) for listed investments is provided by our third-party data provider. The % of shares (which contributes to NAV) is obtained internally. For derivative positions with underlying exposure to listed instruments (equities, bonds, and sovereign bonds) we use the exposure amount in place of the NAV. The exposure is measured as the notional value of the derivative, split into individual constituent weights of the referenced index.

Unlisted investments – Financial data

Valuations for unlisted investments is obtained internally. We use the investment's valuation as of the financial year-end on June 30 as this aligns with that used for financial reporting purposes. The investment value/ownership amount (NAV) is obtained internally and does not include tax liability. We do not include unlisted derivative exposures in the GHG Emissions Inventory.

Sovereign bonds – Financial data

For the value of the country, we use the World Bank GDP-PPP adjusted (current international \$) indicator as a proxy. We use our NAV for investments in sovereign bonds. This is based on the market value of the bond or for derivatives the exposure amount.

8. DATA QUALITY AND COVERAGE

8.1 DATA QUALITY SCORES (FOR LISTED INVESTMENTS)

GHG emissions data for listed investments can be based upon reported data or estimated. To give an indication on how accurate a footprint is PCAF developed a framework of data quality scores. A data quality score 1 indicates the highest quality, while data quality score 5 represents the lowest.

8.2 DATA COVERAGE

Where data is absent, and/or cannot be reliably proxied by our third-party data provider this impacts the available data set. We provide estimates of data coverage for some metrics, indicating the percentage share of total exposure for each asset class, for which minimum required data (e.g. emissions + revenue) is available in usable format.

9. ASSUMPTIONS, LIMITATIONS, ESTIMATION UNCERTAINTIES

The data and methodologies for calculating the GHG Emissions Inventory is evolving and comes with high levels of uncertainty. Key assumptions, limitations and estimation uncertainties are outlined below:

Deviations from PCAF. Whilst deviations of our Management Criteria from PCAF (asset class exclusions; attribution factors; etc.) may have significant impacts on the quantum of our reported GHG metrics relative to those expected under strict PCAF adherence, Management are comfortable with this approach on the basis that: a) the scale of net difference at portfolio level is expected to be proportional to the inherent margin for error of underlying Scope 3 emissions data uncertainty, and; b) the benefits to users of aligning with our GHG and financial reporting approaches, outweigh the risk of emissions misstatements. This position and approach will be reviewed as part of each annual climate-related disclosures cycle.

Asset class exclusions. The GHG Emissions Inventory does not capture all investment asset classes. This is due to one of the following: a lack of defined methodology, a lack of data, and/or the amount held is relatively small in comparison to the total investment value of the Portfolio. Further, investments we define as net neutral over the long-term are excluded (see glossary).

Use of third-party data sources - data quality. We rely on external GHG emissions and financial data from a range of third-party sources which have inherent limitations including data availability, quality, relevance, and accuracy. Third-party data can also be unverified, may differ materially from the most recent published information from other sources, and/or may use proxies in place of published data.

Use of third-party data sources - data timeliness. We run the GHG Emissions Inventory using data available as of the 30 June financial year end. There may be issues regarding the alignment of timings of emissions data and investment data used at this point, due to inherent delays between the reporting, data being loaded onto the third-party database, and the data then being made available to use. Further, there are multiple financial year ends across our investments, and we acknowledge that our calculation contains information that does not necessarily align with our own 30 June year end. To apply consistency across asset classes, we use available data from the most recent 12-month period that is available to us, as at 30 June each year.

Use of third-party data sources – data availability and reliability, especially for scope 3 data. We recognise that Scope 3 data can vary greatly in terms of comparability, coverage, transparency. In the interest of completeness, we include Scope 3 reporting in our GHG Emissions Inventory with the aim of encouraging improved availability and quality of Scope 3 data from our investments over time. Because data availability and reliability are an issue, we expect variations in coverage, and fluctuations in the results for the Scope 3 aspects of our GHG Emissions Inventory.

Market value fluctuations. Our calculations rely on the current market value of an investment. For example, for listed equities this is EVIC, and for unlisted this is the company valuation. The latter is updated annually as part of our investment valuation procedures. Changes in market values can impact our calculations. This means these metrics can change due to factors outside of our control. We do not apply any corrections to allow for market value fluctuations. Market value fluctuations can impact our finalised GHG Emissions Inventory, including the intensity and footprint metrics.

Currency fluctuations. Investment values are received in a range of currencies and converted into NZD by the Fund's custodian. Where financial data is required to be converted within the carbon footprint model, the 30 June London Closing Time exchange rate, sourced from Bloomberg, is used for calculations.

Global Warming Potential (GWP) and greenhouse gas coverage. GWPs are typically set by individual countries. The data we use relies on our asset managers adopting GWPs based upon their assessment of geographical location and using globally-recognized standards such as the GHG Protocol which requires consideration of all GHGs. Since we receive data from thousands of assets and it is neither feasible nor practical to aggregate country-based or investment-level GWPs, and the gases that have been captured. MSCI does not calculate nor report this, nor do they modify the GWP equivalences reported by our access points. Accordingly, we calculate our GHG emissions using an aggregation of available emissions data based on CO₂ equivalents. For sovereign emissions, using the EDGAR database GHG emissions are expressed in CO₂eq using the GWP values of the Fifth Assessment Report of the IPCC.

Use of data sources for sovereign emissions - timeliness. There are significant limitations associated with sovereign emissions. This is due to several factors, including: i) difficulty in obtaining an accurate allocation of emissions along the supply value chain; ii) the time lag in data availability (approximately 2-3 years delay in obtaining emissions data by country).



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Independent Limited Assurance Report to Guardians of New Zealand Superannuation

Conclusion

Our limited assurance conclusion has been formed on the basis of the matters outlined in this report.

Based on our limited assurance engagement, which is not a reasonable assurance engagement or an audit, nothing has come to our attention that would lead us to believe that, in all material respects, the Greenhouse Gas disclosures in the New Zealand Super Fund Climate Change Report 2025 (the **Climate Change Report**), comprising the financed emissions inventory, emission intensity metrics, and the explanatory notes in section 5.1 on pages 28 to 34 (**GHG Disclosures**), has not been prepared in accordance with the disclosed Basis of Preparation (**the criteria**) for the period 1 July 2024 to 30 June 2025.

Information subject to assurance

We have performed an engagement to provide limited assurance in relation to Guardians of New Zealand Superannuation's GHG Disclosures for the period 1 July 2024 to 30 June 2025.

Other Information

Our conclusion on the GHG Disclosures does not extend to any other information included, or referred to, in the Climate Change report, that is not in relation to the financed emissions inventory or the emissions intensity metrics in section 5.1 on pages 28 to 34 (**other information**).

Additionally, our assurance engagement does not extend to consideration of the Unadjusted reference portfolio, of which details may be referenced within 28 to 34:

We have not performed any procedures with respect to the other information.

Criteria

The criteria used as the basis of reporting is outlined in the internally developed Basis of Preparation which is disclosed on pages 43 to 67.

More specifically, the "current" GHG emissions intensities has been prepared in accordance with the criteria specified in Annex A: *Basis of Preparation – Current GHG emissions approach (2020-25)* on pages 43 to 45.

The "revised" GHG emissions intensities and financed emissions inventory intensities has been prepared in accordance with the criteria specified in Annex B: *Basis of Preparation – Revised GHG emissions approach (2025-30)* on pages 46 to 66.

As a result, this report may not be suitable for another purpose.



Standards we followed

We conducted our limited assurance engagement in accordance with International Standard on Assurance Engagements (New Zealand) 3410 Assurance Engagements on Greenhouse Gas Statements (**ISAE (NZ) 3410**) issued by the New Zealand Auditing and Assurance Standards Board (**Standard**). We believe that the evidence we have obtained is sufficient and appropriate to provide a basis for our conclusion.

Our responsibilities under the Standard are further described in the 'Our responsibility' section of our report.

Emphasis of Matter – Reliance on third-party data providers

We draw attention to the use of third-party data sources disclosures in section 9. *Assumptions, limitations, estimation uncertainties* on page 67 which describes the inherent limitations arising from the reliance on third-party data providers and the data they provide in calculating the financed emissions inventory and emissions intensities. The disclosure highlights that inherent limitations and risks exist regarding the quality, timeliness, availability and reliability of data relied upon by Guardians of New Zealand Superannuation.

Our conclusion is not modified in respect of this matter.

How to interpret limited assurance and material misstatement

A limited assurance engagement is substantially less in scope than a reasonable assurance engagement in relation to both the risk assessment procedures, including an understanding of internal control, and the procedures performed in response to the assessed risks.

Misstatements, including omissions, within the GHG Disclosures are considered material if, individually or in the aggregate, they could reasonably be expected to influence the relevant decisions of the intended users taken on the basis of the GHG Disclosures.

Inherent limitations

As noted in the Annex B: *Basis of Preparation – Revised GHG emissions approach (2025-30)* page 68, GHG quantification is subject to inherent uncertainty because of incomplete scientific knowledge used to determine emission factors and the values needed to combine emissions of different gases. As noted above, there are additional significant inherent limitations as a result of the reliance on third-party data providers specifically that the data provided by the third-party:

- may differ materially from the most recent published information; and
- may use proxies in place of the published actual data.

The reliance on this data is consistent with the Criteria and our conclusion is not modified in respect of this matter.

Use of this assurance report

Our report is made solely for Guardians of New Zealand Superannuation. Our assurance work has been undertaken so that we might state to Guardians of New Zealand Superannuation those matters we are required to state to them in the assurance report and for no other purpose.

Our report is released to Guardians of New Zealand Superannuation on the basis that it shall not be copied, referred to or disclosed, in whole or in part, without our prior written consent. No other third party is intended to receive our report.



Our report should not be regarded as suitable to be used or relied on by anyone other than Guardians of New Zealand Superannuation for any purpose or in any context. Any other person who obtains access to our report or a copy thereof and chooses to rely on our report (or any part thereof) will do so at its own risk.

To the fullest extent permitted by law, none of KPMG, any entities directly or indirectly controlled by KPMG, or any of their respective members or employees accept or assume any responsibility and deny all liability to anyone other than Guardians of New Zealand Superannuation for our work, for this independent assurance report, and/or for the opinions or conclusions we have reached.

Our conclusion is not modified in respect of this matter.

Guardians of New Zealand Superannuation's responsibility for the GHG Disclosures

The Directors of Guardians of New Zealand Superannuation are responsible for the preparation of the GHG Disclosures in accordance with the criteria. This responsibility includes the design, implementation and maintenance of such internal control as Directors determine is relevant to enable the preparation of the GHG Disclosures that are free from material misstatement whether due to fraud or error.

The Directors of Guardians of New Zealand Superannuation are also responsible for selecting or developing suitable criteria for preparing the GHG Disclosures and appropriately referring to or describing the criteria used.

Our responsibility

We have responsibility for:

- planning and performing the engagement to obtain limited assurance about whether the GHG Disclosures are free from material misstatement, whether due to fraud or error;
- forming an independent conclusion based on the procedures we have performed and the evidence we have obtained; and
- reporting our conclusion to Guardians of New Zealand Superannuation.

Our work was carried out by a multidisciplinary team, including specialists in data science, who assisted with assurance procedures. We remain solely responsible for assurance conclusion.

Summary of the work we performed as the basis for our conclusion

A limited assurance engagement performed in accordance with the Standard involves assessing the suitability in the circumstances of Guardians of New Zealand Superannuation's use of the criteria as the basis for the preparation of the GHG Disclosures, assessing the risks of material misstatement of the GHG Disclosures whether due to fraud or error, responding to the assessed risks as necessary in the circumstances, and evaluating the overall presentation of the GHG Disclosures.

We exercised professional judgment and maintained professional scepticism throughout the engagement. We designed and performed our procedures to obtain evidence about the GHG Disclosures that is sufficient and appropriate to provide a basis for our conclusion.

Our procedures selected depended on an understanding of the GHG Disclosures that is sufficient and appropriate to provide a basis for our conclusion. The procedures we performed were based on our professional judgment and included inquiries, observation of processes performed, inspection of documents, analytical procedures, evaluating the appropriateness of quantification methods and reporting policies, and agreeing or reconciling with underlying records.

In undertaking limited assurance on the GHG Disclosures, the procedures we primarily performed were:



- obtained, through inquiries, an understanding of Guardians of New Zealand Superannuation control environment, processes and information systems relevant to the preparation of the GHG Disclosures. We did not evaluate the design of particular control activities, or obtain evidence about their implementation;
- evaluated whether Guardians of New Zealand Superannuation methods for developing estimates are appropriate and had been consistently applied. Our procedures did not include testing the data on which the estimates are based or separately developing our own estimates against which to evaluate Guardians of New Zealand Superannuation estimates;
- recalculated the emissions for a limited number of items;
- obtained confirmation for a limited number of emission values from relevant third parties;
- performed analytical procedures on emission intensity metrics by comparing the expected intensity to the actual intensity and made inquiries of management to obtain explanations for any significant differences we identified
- assessed the accuracy of the implementation of the IT application scripts; and
- considered the adequacy of disclosures within the criteria including assumptions, limitations and estimation uncertainties disclosures.

The procedures performed in a limited assurance engagement vary in nature and timing, and are less in extent than a reasonable assurance engagement. Consequently, the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had a reasonable assurance engagement been performed.

Our independence and quality management

We have complied with the independence and other ethical requirements of Professional and Ethical Standard 1 *International Code of Ethics for Assurance Practitioners (including International Independence Standards)* (New Zealand) (**PES 1**) issued by the New Zealand Auditing and Assurance Standards Board, which is founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behaviour.

The firm applies Professional and Ethical Standard 3 *Quality Management for Firms that Perform Audits or Reviews of Financial Statements, or Other Assurance or Related Services Engagements* (**PES 3**), which requires the firm to design, implement and operate a system of quality control including policies or procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

We have also complied with Professional and Ethical Standard 4 *Engagement Quality Reviews* (**PES 4**) which deals with the appointment and eligibility of the engagement quality reviewer and the engagement quality reviewer's responsibilities relating to the performance and documentation of an engagement quality review.

Our firm has also provided advisory services including, financial risk management, tax consulting, ready for assurance and compliance, cyber and IT advice to Guardians of New Zealand Superannuation. Subject to certain restrictions, partners and employees of our firm may also deal with x on normal terms within the ordinary course of trading activities of the business of Guardians of New Zealand Superannuation. These matters have not impaired our independence as assurance providers of Guardians of New Zealand Superannuation for this engagement. The firm has no other relationship with, or interest in, Guardians of New Zealand Superannuation.

KPMG.

KPMG

Auckland

24 September 2025