NZ SUPER FUND PORTFOLIO CARBON FOOTPRINT 2020

The Guardians is committed to reducing the NZ Super Fund's exposure to carbon. We define carbon exposure as a combination of the portfolio's current carbon emissions intensity (emissions intensity) and potential future carbon emissions from fossil fuel reserves (fossil fuel reserves). By 2020, we targeted a reduction in the carbon emission intensity of the Fund by at least 20%, and in fossil fuel reserves by at least 40%. We have achieved these targets.

Our focus on reducing carbon exposure is one part of our overall climate change investment strategy. This strategy also includes analysing investments for their exposure to risk from climate change, engaging with companies on their climate change strategies, and searching for new investment opportunities that arise from climate change and related policy responses. For more information refer to: https://www.nzsuperfund.nz/how-we-invest-balancing-risk-and-return-climate-change/climate-change-strategy.

This footprint report quantifies the Fund's carbon exposure as at 30 June 2020 (refer to Table 1 below). We use this measurement to determine whether we have achieved our 2020 carbon reduction targets. As part of our climate change strategy, one of our first steps was to reduce the carbon exposure of the Fund's global listed equities portfolio in 2017 (physical and passive). Over 2018 and 2019, we took additional steps in reducing carbon exposure in the Fund's actively managed equity and derivative exposure[1] and significantly exceeded our carbon targets. In 2020, we further refined our approach, implementing a new approach which further decreased the Fund's exposure to climate reserves.

The 2020 carbon footprint is:

- an estimated – 40.0% as measured by emissions intensity (expectation -20%); and
- - 90.0% as measured by fossil fuel reserves compared to our original Reference Portfolio (expectation -40%).

We report on the Fund's carbon footprint annually in order to track our progress. The climate change strategy is a long-term one and while there may be volatility in the footprint from year to year, it is most important to focus on longer-term trends in the footprint relative to our targets.

The approach to reducing the Fund's carbon footprint relative to our targets is set out in box 1 below. Box 1 and 2 in this document outline our carbon reduction methodology and the main metrics used for the calculations respectively. We measure the improvement in

[1] A **derivative** is a contract between two parties which derives its value/price from an underlying asset. The most common types of **derivatives** are futures, options, forwards and swaps.

the footprint against what the Fund would have owned if we had not implemented the carbon reductions to its passive global equity portfolio.

Table 1: 2020 Carbon Footprint (emissions intensity) of the NZ Super Fund[2,3]

	30th June 2018	30th June 2019	30th June 2020
	Target Footprint Metrics[4]		
	Emissions Intensity per $ of firms sales (tonnes of CO_2e^5/$USm Sales)		
Unadjusted Reference Portfolio	241.6	230.7	212.9
NZ Super Fund	196.3	131.8	127.6
% Reduction	**- 18.7%**	**- 42.9%**	**- 40.0%**
	Potential Emissions from Fossil Fuel Reserves per $ invested (tonnes CO_2e/NAV[6] $USm)		
Unadjusted Reference Portfolio	2,578	2,740	2,324
NZ Super Fund	1,752	1,319	233
% Reduction	**- 32.1%**	**- 51.9%**	**-90.0%**

Box 1: Our reduction methodology – applied to passive physical listed global Equities

In 2017 we created a bespoke methodology for reducing our carbon exposure of our listed portfolio based on independent third-party data on emissions intensity and fossil fuel reserves provided by MSCI ESG Research. Our focus was on stocks with high carbon footprints without regard to sector. The methodology identifies stocks that exceed thresholds for either emissions intensity which are not considered to be standout performers and stocks with fossil fuel reserves.

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[2] NZ Super Fund portfolio footprint includes active and passive listed physical equities, passive equity derivative exposures, and other unlisted assets. Further details provided in Box 2.

[3] We have made a number of methodological changes and error corrections for the FY20 carbon footprint. These are: (1) adjustments to the accounting of hydrolic fracturing as required by the US EPA's Greenhouse Gas Reporting Program for our shale assets; (2) updating emissions factors for our toll road assets; (3) including the electricity for irrigation in calculating the Scope 2 emissions of our rural properties; (4) correcting an error in our ownership percentage for some of our forestry assets; and (5) proxying emissions for one of our direct private market assets whose footprint only covers part of the business. We have decided not to restate FY19 footprint because we do not believe these changes would have a material impact. However, we note that this means that the FY20 data is not directly comparable to the FY19 data.

[4] Refer to box 2 on definitions of reported metrics.

[5] Greenhouse gases are usually measured as a CO2 equivalent (CO2e), and for simplicity in this paper we use the word 'carbon' to refer to all these greenhouse gases. See https://www.msci.com/www/research-paper/carbon-footprinting-101-a/0229050187 for formulas for carbon metrics.

[6] Net Asset Value (NAV)

Specifically, stocks with high emissions intensity which were in the top quartile of MSCI ESG Research's "Carbon Emissions" score – reflecting less risk due to better management than their peers with respect to climate issues have been retained in the portfolio. Stocks that were not in the top quartile have been eliminated from the portfolio one-by-one until we met specific the 50% reduction target for the passive physical global equity portfolio. This year we targeted a 100% reduction in fossil fuel reserves and as such we got rid of all of all companies with fossil fuel reserves from our portfolio (see the New Zealand 2020 Climate Change Report for a full explanation of these changes).

These targets were previously set at -70% carbon fossil fuel reserves and -50% emissions intensity compared to the Reference Portfolio. The top quartile exclusion used to be applied for the purposes of reducing the fossil fuel reserves but this is no longer feasible as we are aiming to completely divest from investments with fossil fuel reserves.
We will continue to refine this methodology and will reapply it annually.

Box 2: Fund's Approach to Carbon Footprinting

Measurement

Listed Portfolio
We obtained MSCI ESG Research's footprint calculations for our Actual Fund Equities (this includes active and passive listed physical equities, and passive equity derivative exposures), which accounts for 42.9% of the Fund's holdings by asset value at 30 June 2020. 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.

The MSCI ESG Research data used covered 99% of our listed equity holdings (by value) with a mixture of reported figures and model-based estimates. Our bond investments make up approximately 7.3% of the portfolio and are considered to have no carbon footprint at this stage and for this reason we have assigned zero emissions to bonds.

Our equity positions taken as part of our strategic tilting program as well as life settlements, natural catastrophe insurance, active collateral, and other market neutral strategies (32.5% of the Fund) have been excluded from this analysis.

Unlisted Portfolio
As of 30th of June, the Fund has approximately 18% invested in unlisted assets. Timber assets are one of our largest investments consisting of 5.2% of our total portfolio assets and rural investments make up 1.3% of the portfolio. For timber and rural assets, we obtain emissions data from the asset operators. The footprint is then calculated by a third party provider S&P Global and apportioned based on our ownership of the assets. We have selected these unlisted assets for footprinting based on our investment exposure in the assets, and the climate change risk exposure of the assets.

In addition, where carbon data is available, we obtain information directly from our external managers or asset operators. e.g. for Shale investments, Kiwibank , Metlifecare and Horizon Roads.

In total, carbon data was obtained in this way for approximately 8.6% of the of portfolio.

Proxy-based estimates
For the remaining unlisted assets where no data was available (approximately 8.7% of the Fund), the emissions intensity and fossil fuel reserves have been proxied. The proxies are based on the average emissions per million dollars invested. Where the asset can be clearly assigned to a sector, as referenced in the Global Industry Classification Standard (GICS), then we use the emissions from that sector. Otherwise, we use the general average. We use MSCI's data for our unadjusted Reference Portfolio to determine these averages.

Calculation
Total portfolio footprinting is a combination of our listed portfolio emissions (calculated by MSCI), obtained carbon data, and proxy-based estimates. Of the total portfolio, approximately 63.6% is based on externally sourced data (MSCI (43.4%) and S&P Global (6.5%)), 2.0% is estimated by external managers or asset operators, and 8.7% has a proxy footprint applied. The remainder of the portfolio is assigned a nil footprint (as specified above).

Data and Definitions
Greenhouse gases are usually measured as a CO_2 equivalent (CO_2e), and for simplicity in this paper we use the word 'carbon' to refer to all these greenhouse gases. See https://www.msci.com/www/research-paper/carbon-footprinting-101-a/0229050187 for formulas for carbon metrics.

We have followed the approach of measuring Scope 1 and Scope 2 emissions in our footprint.

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). S&P Global don not include scope 2 emissions for Timber because scope 2 emissions are immaterial.
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. We did not include scope 3 in our footprint calculations other than for fossil fuel reserves (see below) as most scope 3 estimation methodology remains in its infancy [7].

Both MSCI and S&P global have used the Greenhouse Gas Protocol as the basis of their footprinting calculations https://ghgprotocol.org/.

Footprint Target Metrics Reported:[8]
Emissions Intensity: measured tonnes CO2e/$m sales = Tonnes of carbon emissions divided by $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 robust to movements in market valuations. The emissions/sales of listed equities is derived from MSCI.

Potential Emissions: measures tonnes CO2e/$m invested = Tonnes of carbon emissions divided by $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 tonnes of CO_2 equivalent using the Potsdam Institute methodology. This includes proved and probable fossil fuel reserves.

Fossil Fuel Reserves Calculations
For listed holdings, fossil fuel reserves data is received from MSCI. For unlisted assets where carbon data was obtained, we assumed that the asset owned no fossil fuel reserves unless we have direct knowledge to the contrary (e.g. KKR Shale). For KKR Shale, we estimated the fossil fuel reserves by calculating the potential emissions from fossil fuel reserves per $m invested for the GICS Energy Sector using underlying holdings carbon data from MSCI, and applying this ratio to the KKR asset.

For assets with proxy-based estimates, we assumed that a company has no fossil fuel reserves unless it is a fund that can invest across a range of sectors and it is plausible that some investments could have fossil fuel reserves. 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 USD terms to facilitate easier comparison both over time and to other international funds.

[7] Source: MSCI ESG Research
[8] Source: MSCI ESG Research

Independent Limited Assurance Report to the Directors of the Guardians of the 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 the Carbon Footprint (emissions intensity) presented in the NZ Super Fund Portfolio Carbon Footprint 2020 ("Portfolio Carbon Footprint") has not, in all material respects, been prepared in accordance with the requirements of Guardians of the New Zealand Superannuation management criteria (the "Criteria") for the period 1 July 2019 to 30 June 2020.

Information subject to assurance

We have performed an engagement to provide limited assurance in relation to Guardians of the New Zealand Superannuation's ("GNZS's") Carbon Footprint (emissions intensity) presented in the Portfolio Carbon Footprint, for the period 1 July 2019 to 30 June 2020.

Criteria

The subject matter of the Carbon Footprint (emissions intensity) presented in the Portfolio Carbon Footprint was evaluated against the Criteria specified in 'Box 2: Fund's Approach to Carbon Footprinting (emissions intensity)' contained within the Portfolio Carbon Footprint.

Standards we followed

We conducted our limited assurance engagement in accordance with International Standard on Assurance Engagements (New Zealand) 3000 (Revised) *Assurance Engagements other than audits or reviews of historical financial information* and International Standard on Assurance Engagements (New Zealand) 3410 *Assurance Engagements on Greenhouse Gas Statements*. We believe that the evidence we have obtained is sufficient and appropriate to provide a basis for our conclusion. In accordance with that standards we have:

— used our professional judgement to plan and perform the engagement to obtain limited assurance that the Carbon Footprint (emissions intensity) is free from material misstatement and non-compliance, whether due to fraud or error;

— considered relevant internal controls when designing our assurance procedures, however we do not express a conclusion on the effectiveness of these controls; and

— ensured that the engagement team possess the appropriate knowledge, skills and professional competencies.

The procedures performed in a limited assurance engagement vary in nature and timing from, and are less in extent than for 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.

Restriction of distribution and use

Our report should not be regarded as suitable to be used or relied on by any party's other than GNZS for any purpose or in any context. Any party other than GNZS 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, we accept or assume no responsibility and deny any liability to any party other than GNZS for our work, for this independent limited assurance report, or for the conclusions we have reached.

Our report is released to GNZS on the basis that it shall not be copied, referred to or disclosed, in whole (save for GNZS's own internal purposes) or in part, without our prior written consent.

Management's responsibility for the Carbon Footprint (emissions intensity)

Management of GNZS are responsible for the preparation and fair presentation of the Carbon Footprint (emissions intensity), presented within the Portfolio Carbon Footprint in accordance with the Criteria. This responsibility includes such internal control as Management determine is necessary to enable the preparation of a Carbon Footprint (emission intensity) to be presented in the Portfolio Carbon Footprint that is free from material misstatement and non-compliance whether due to fraud or error.

Our responsibility

Our responsibility is to express a conclusion to the Directors on whether anything has come to our attention that the Carbon Footprint (emissions intensity) presented within the Portfolio Carbon Footprint has not, in all material respects, been prepared in accordance with the Criteria.

Our independence and quality control

We have complied with the independence and other ethical requirements of Professional and Ethical Standard 1 (Revised) 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 (Amended) and accordingly maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

Our firm has also provided advisory services to GNZS. Subject to certain restrictions, partners and employees of our firm may also deal with GNZS on normal terms within the ordinary course of trading activities of the business of GNZS. These matters have not impaired our independence as assurance providers of GNZS for this engagement. The firm has no other relationship with, or interest in, GNZS.

KPMG.

KPMG
Auckland, New Zealand

10 September 2020