NZ SUPER FUND GREENHOUSE GAS (GHG) STATEMENT

OVER THE INVESTMENT PORTFOLIO

The Guardians is committed to reducing the 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 target a reduction in the carbon emission intensity of the Fund by at least 20% and in fossil fuel reserves by at least 40%.

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 our carbon exposure as at 30 June 2019 (refer to Table 1 below). We use this measurement as a means of tracking our progress towards our 2020 carbon reduction targets. As part of our climate change strategy, one of our first steps was to reduce the carbon exposure of our global listed equities portfolio in 2017 (physical and passive). Over 2018 and 2019, we took additional steps in reducing our carbon exposure in our actively managed equity and derivative exposure[1] enabling us to exceed our carbon targets significantly.

The 2019 carbon footprint is:

- an estimated – 42.9% lower, as measured by emissions intensity (expectation - 20%); and
- - 51.9% as measured by fossil fuel reserves compared to our original Reference Portfolio (expectation - 40%).

We report on our 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 our 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 the footprint against what we would have owned if we had not implemented the carbon

[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.

reductions to the passive global equity portfolio – i.e. the Reference Portfolio.

Table 1: 2019 Carbon Footprint (emission intensity) of the NZ Super Fund[2]

30th June 2018		30th June 2019	30 June 2020 Targets
	Target Footprint Metrics[3]		
	Emissions Intensity per $ of firms sales (tonnes of CO_2e[4]/$USm Sales)		
Unadjusted Reference Portfolio	241.6	230.7	
NZ Super Fund	196.3	131.8	
% Reduction	**- 18.7%**	**- 42.9%**	- 20%
	Potential Emissions from Fossil Fuel Reserves per $ invested (tonnes CO_2e/NAV[5] $USm)		
Unadjusted Reference Portfolio	2,578	2,740	
NZ Super Fund	1,752	1,319	
% Reduction	**- 32.1%**	**- 51.9%**	- 40%

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 or for fossil fuel reserves, and which are not considered to be standout performers. Specifically, stocks 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 reduction targets for the passive physical global equity portfolio. These targets were set at -70% carbon fossil fuel reserves and -50% emissions intensity compared to the Reference Portfolio.

We will continue to refine this methodology and will reapply it annually.

[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] Refer to box 2 on definitions of reported metrics.
[4] 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.
[5] Net Asset Value (NAV)

Box 2: Fund's Approach to Carbon Footprinting (emissions intensity)

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 57.2% of the Fund's holdings by asset value at 30 June 2019. 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 98% of our listed equity holdings (by value) with a mixture of reported figures and model-based estimates. Our bond investments make up approximately 9.1% 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 catastrophic insurance, active collateral, and other market neutral strategies (16.2% 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 1.2% 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 for approximately 9% of the unlisted portfolio.

Proxy-based estimates

For the remaining unlisted assets where no data was available (approximately 8.4% of the Fund), the emissions intensity and fossil fuel reserves have been proxied. The proxies are based on the general sector of activity of the asset as referenced in the Global Industry Classification Standard (GICS). MSCI provides carbon data on these sectors.

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 (57.2%) and S&P Global (6.4%)), 2.6% is estimated by external managers or asset operators, and 8.4% 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 do 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 [6].

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

Footprint Target Metrics Reported:[7]

Emissions Intensity: measured tonnes CO2e/$m sales = Tonnes of carbon emissions divided by $USm 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 $USm 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.

[6] Source: MSCI ESG Research

[7] Source: MSCI ESG Research