

NZ SUPER FUND CARBON FOOTPRINT 2018

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 2018 (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). Since then, we have been in the process of reducing our carbon exposure in our actively managed equity holdings.

The 2018 carbon footprint is:

- an estimated 18.7% lower as measured by emissions intensity; and
- 32.1% lower as measured by fossil fuel reserves compared to our original Reference Portfolio.

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 reductions to the passive global equity portfolio – i.e. the [Reference Portfolio](#).

Additional steps were taken this year to extend our carbon reduction methodology within our listed equity holdings. This change resulted in further reductions in Emissions Intensity and Fossil Fuel Reserves for the listed equities. While Fossil Fuel Reserves also declined at the total Fund level, reported Emissions Intensity increased slightly from 2017¹ as a

¹ 2017: Carbon footprint was 19.6% lower as measured by emissions intensity; and 21.5% lower as measured by fossil fuel

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result of methodological changes to increase the accuracy of how we calculate the footprint of unlisted assets. As such, the 2017 footnoted and 2018 figures are not directly comparable.

Table 1: 2018 Carbon Footprint of the NZ Super Fund²

	30th June 2018	30 June 2020 Targets
Target Footprint Metrics³		
	<i>Emissions Intensity per \$ of firms sales (tonnes of CO₂e⁴/\$USm Sales)</i>	
Unadjusted Reference Portfolio	241.6	
NZ Super Fund	196.3	
% Reduction	- 18.7%	- 20%
	<i>Potential Emissions from Fossil Fuel Reserves per \$ invested (tonnes CO₂e/NAV⁵ \$USm)</i>	
Unadjusted Reference Portfolio	2,578	
NZ Super Fund	1,752	
% Reduction	- 32.1%	- 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.

reserves compared to our original Reference Portfolio.

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.

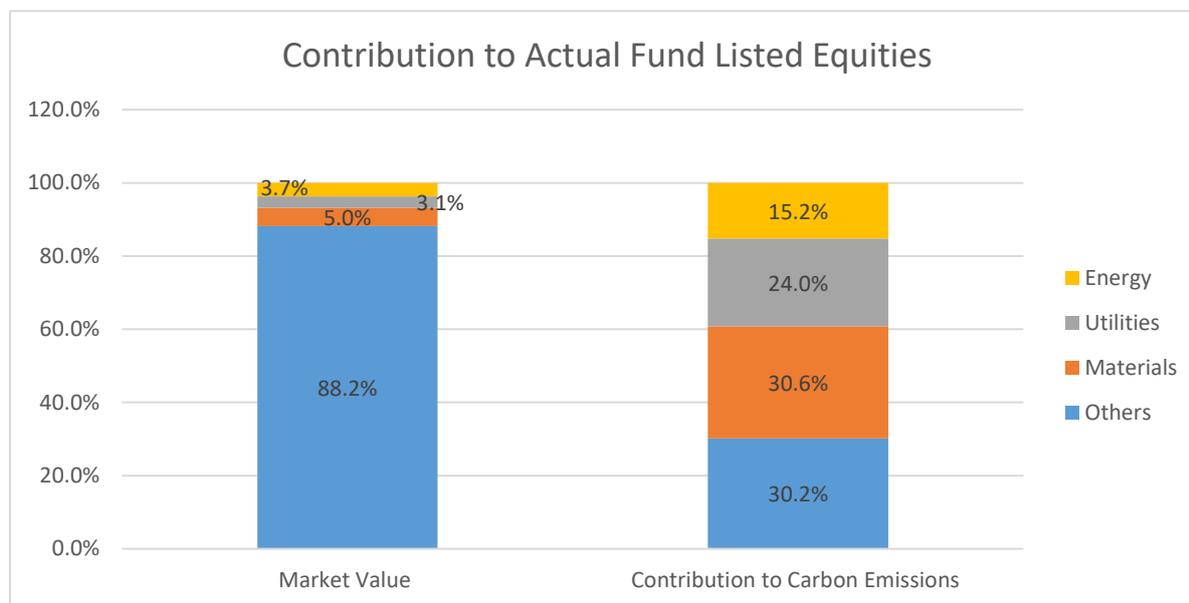
⁴ Greenhouse gases are usually measured as a CO₂ equivalent (CO₂e), and for simplicity in this paper we use the word 'carbon' to refer to all these greenhouse gases. See <https://www.msci.com/www/research-paper/carbon-footprinting-101-a/0229050187> for formulas for carbon metrics.

⁵ Net Asset Value (NAV)

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The carbon emissions profile of the Fund remains heavily concentrated in a few sectors that make up a relatively small share of the Fund's assets. As per Chart 1 below, three sectors – Utilities, Materials, and Energy – accounts for 70% of the remaining Scope 1 and 2 carbon emissions, but represents only 12% of the value of the *Actual Fund Listed Equities*⁶.

Chart 1: Sector carbon exposure (listed equities, scope 1&2 emissions)⁷



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 72% of the Fund's holdings by asset value at 30 June 2018. 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 11% 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 (13% of the Fund) have been excluded from this analysis.

Unlisted Portfolio

As of 30th of June, the Fund has approximately 18% invested in unlisted assets⁸. Timber assets are one of our largest investments consisting of 5.8% 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.

⁶ Source: MSCI ESG Research Carbon Portfolio Analytics 2018.

⁷ Source: MSCI Carbon Portfolio Analytics 2018

⁸ The total portfolio for footprinting of listed equities, excluded assets and unlisted assets totals to 114%. This is because of the notational swap exposure being treated a physical equities.

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<p>In addition, where carbon data is available, we obtain information directly from our external managers or asset operators e.g. for Shale investments (0.4% of the Fund), Kiwibank (1% of the Fund), Metlifecare (0.7% of the Fund) and Horizon Roads (1.1% of the Fund).</p> <p>In total, carbon data was obtained for approximately 10% of the unlisted portfolio.</p>
<p>Proxy-based estimates</p> <p>For the remaining unlisted assets where no data was available (approximately 8% 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.</p>
<p>Calculation</p> <p>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 79% is based on externally sourced data (MSCI (72%) and S&P Global (7%)), 3% is estimated by external managers or asset operators, and 8% has a proxy footprint applied. The remainder of the portfolio is assigned a nil footprint (as specified above).</p>
<p>Data and Definitions</p> <p>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.</p> <p>We have followed the approach of measuring Scope 1 and Scope 2 emissions in our footprint.</p> <p>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.</p> <p>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).</p> <p>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 infancy⁹.</p> <p>Both MSCI and S&P global have used the Greenhouse Gas Protocol Protocol as the basis of their footprinting calculations https://ghgprotocol.org/.</p>
<p>Footprint Target Metrics Reported:¹⁰</p> <p>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.</p> <p>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 CO₂ equivalent using the Potsdam Institute methodology. This includes proved and probable fossil fuel reserves.</p> <p>Fossil Fuel Reserves Calculations</p> <p>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,</p>

⁹ Source: MSCI ESG Research

¹⁰ Source: MSCI ESG Research

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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.