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NZSUPERFUND

*Te Kaitiaki Tāhua Penihana
Kaumatua o Aotearoa*

TITLE:

Climate Change Investment Strategy Refresh

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Chief Investment Officer, Head of Responsible Investment

EVENT | PRESENTATION:

NZSF Board Strategy Day, 20 February 2017

Our mandate, beliefs and climate change

Climate Change is addressed as an investment strategy – based on our mandate, beliefs and investment frameworks.

The most relevant legs of our mandate are:

- best practice portfolio management;
- maximising return without undue risk to the Fund as a whole;

We believe climate change is a material long-term risk for which the Fund will not be rewarded. Ignoring climate change in our investment decisions could expose the Fund to “undue risk”.

Our investment beliefs require us to have regard to climate change:

“Responsible investors must have concern for ESG factors because they are material to long-term returns”

“Investors with a long-term horizon can outperform more short-term focused investors over the long-run”

For these reasons we believe climate change risk requires an investment response, supported by our RI and Investment Frameworks, rather than an ethical policy decision.

However, the relevance of the “avoiding prejudice to New Zealand’s reputation” leg of our mandate will increase over time and this will be monitored through our RI policy work in this area.

Climate change – an undue risk

- Climate change presents a risk for which we believe we will not be rewarded – an undue risk over the long-term – and it is good practice to try to hedge this risk.
- *Climate change is a market and policy failure:* markets are producing too many emissions and are over-invested in fossil fuels. We believe carbon risk is under-priced partly because the time horizon over which the effects will manifest is too long for most market analysts – but it is relevant to the time horizon that matters for the Fund.
- Risk arises from impacts on
 - a) supply and demand changes from substitution, higher cost structures, consumer preference, and regulation;
 - b) physical damage or disruption to industries and economies; and
 - c) inability to adapt at reasonable cost over a reasonable period.
- *Climate change is different from other themes:* it has multiple drivers across technological change, resource & physical impacts, and policy actions; it encompasses both listed and alternative assets – but impacts them in different ways; requires an energy shift which affects all sectors; and is an inter-generational and cross-boundary issue.
- No single metric fully captures the risk & no single tool can deal with managing the difference or significance of impacts between asset classes.
- Reducing exposure in the equity portfolio, where most of our risk lies, offers a low-cost insurance policy. If the markets really do efficiently price climate change risks, then we have shifted weightings from some fair-priced assets to others.
- Integrating long-term risk analysis into our active decision-making builds resilience across the whole portfolio.

Potential Impact: Mercer scenarios by industry sector

Table 6:
Sensitivity to the climate change risk factors: industry and sector level

| INDUSTRY SECTOR | T | R | I | P |
|-------------------------------|-------|-------|-------|-------|
| ENERGY | -0.25 | -0.75 | -0.75 | -0.75 |
| Oil | -0.50 | -0.75 | -0.75 | -0.75 |
| Gas | -0.25 | -0.50 | -0.75 | -0.25 |
| Coal | -0.50 | -0.75 | -0.75 | -1.00 |
| Renewable | 0.50 | -0.25 | -0.25 | 1.00 |
| Nuclear | 0.50 | -0.75 | -0.25 | 0.50 |
| UTILITIES | -0.25 | -0.75 | -0.50 | -0.50 |
| Electric | -0.50 | -0.75 | -0.50 | -1.00 |
| Gas | -0.25 | -0.75 | -0.25 | -0.50 |
| Multi | -0.25 | -0.75 | -0.50 | -0.75 |
| Water | -0.25 | -0.50 | -0.25 | -0.75 |
| MATERIALS | -0.25 | -0.75 | -0.25 | -0.50 |
| Metals and mining | -0.25 | -0.75 | -0.25 | -0.75 |
| INDUSTRIALS | -0.25 | -0.25 | -0.50 | -0.25 |
| Transport and infrastructure | -0.25 | -0.25 | -0.75 | -0.25 |
| CONSUMER DISCRETIONARY | 0.00 | 0.00 | 0.00 | -0.25 |
| CONSUMER STAPLES | 0.00 | -0.25 | 0.00 | -0.25 |
| HEALTH | 0.00 | -0.25 | -0.25 | 0.00 |
| FINANCIALS | 0.00 | -0.25 | -0.50 | 0.00 |
| IT | -0.25 | 0.00 | 0.00 | 0.00 |
| TELECOMMUNICATIONS | 0.00 | 0.00 | -0.25 | 0.00 |

Negative Positive

TECHNOLOGY (T)

Broadly defined as the rate of progress and investment in the development of technology to support the low-carbon economy.

RESOURCE AVAILABILITY (R)

Defined as the impact on investments of chronic weather patterns (e.g. long-term changes in temperature or precipitation).

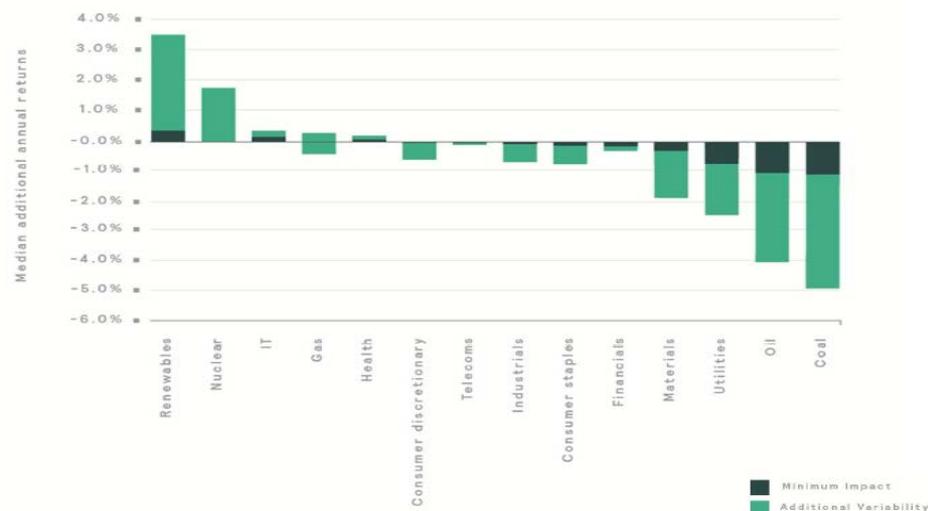
IMPACT (I)

Defined as the physical impact on investments of acute weather incidence/severity (i.e. extreme or catastrophic events).

POLICY (P)

Broadly defined as all international, national, and sub-national targets; mandates; legislation; and regulations meant to reduce the risk of further man-made or "anthropogenic" climate change.

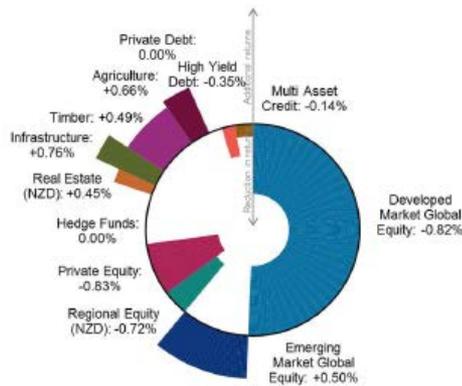
Figure 18:
Climate impact on return by industry sector (35 years)



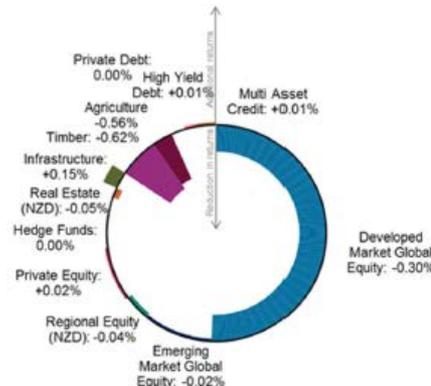
Potential Impact: Mercer scenarios by asset class

Figure 1:
NZ Super Asset Allocation (data over 10 years)

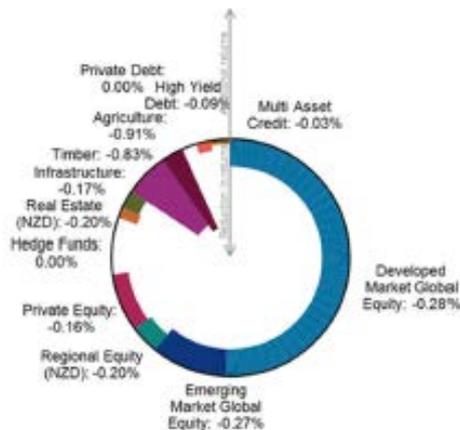
Transformation



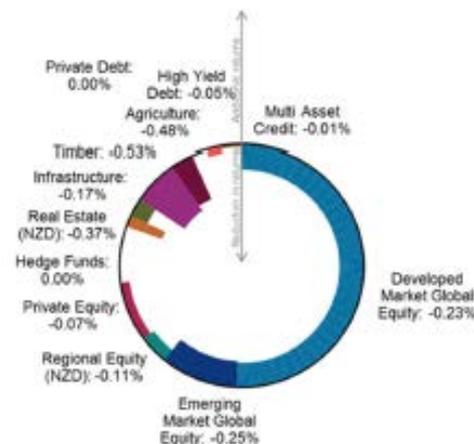
Coordination



Fragmentation – Lower Damages



Fragmentation – Higher Damages



Transformation: Climate change is contained to 2DC. Fossil fuel use is reduced to less than 50% of the energy mix by 2050 due to policy and technology – i.e. technology and policy risk factors have a larger effect on asset returns than impact and resource availability.

Coordination: Climate change is contained to 3DC. Fossil fuel use is constrained to 75% of energy mix by 2050. All risk factors play a role across asset returns.

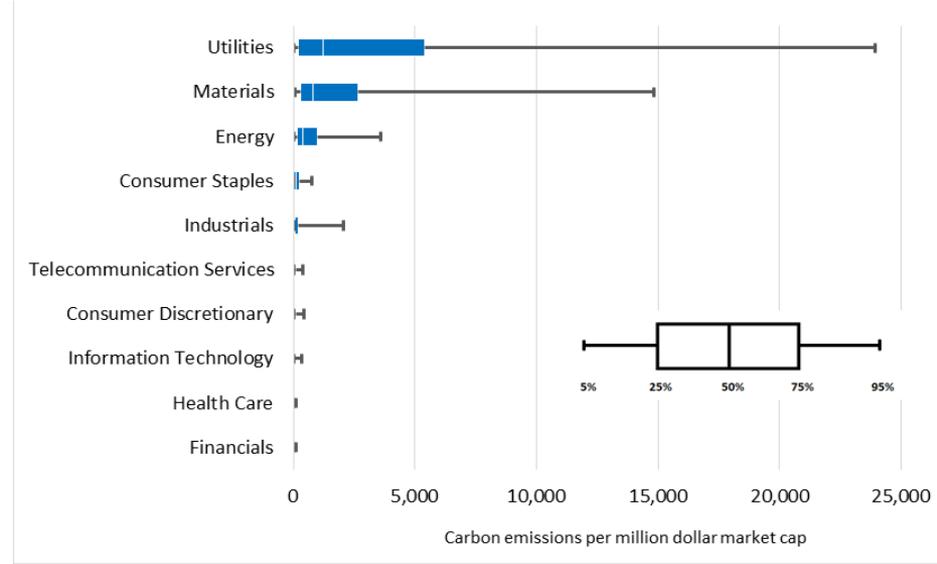
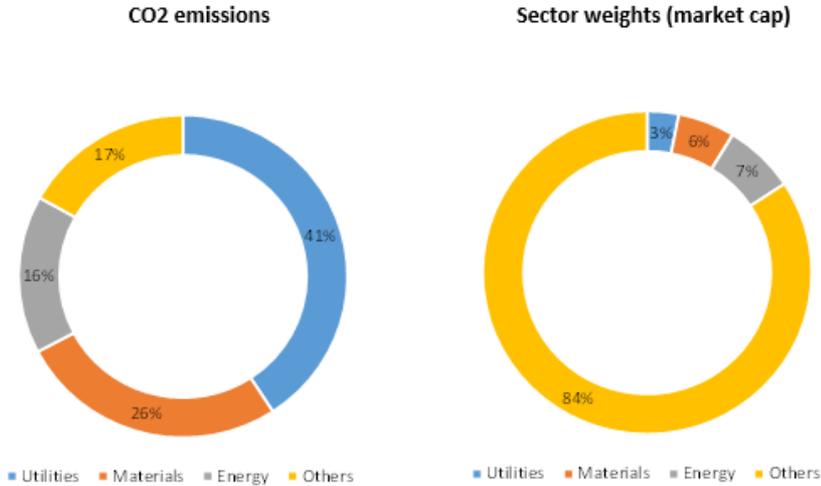
Fragmentation (low damage): Climate change contained to 4DC.

Fragmentation (high damage): Climate change contained to 5DC.

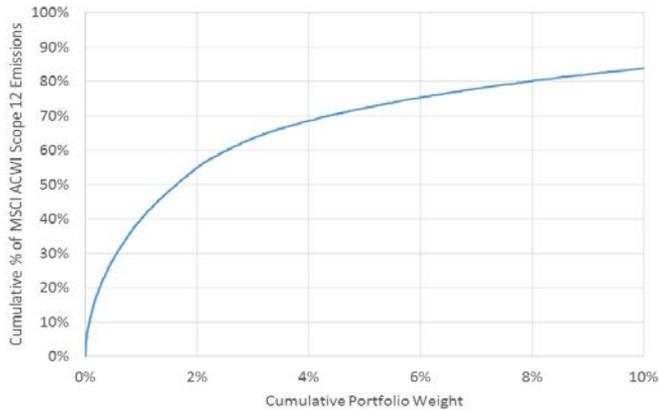
Both Fragmentation scenarios represent a lack of action and assume marginal impact from the technology and policy risk factors, but significant affects from the Impact and Resource availability risk factors as the world does little, at least initially, to address climate change.

Source: Mercer 2015 "Investing in a time of climate change"

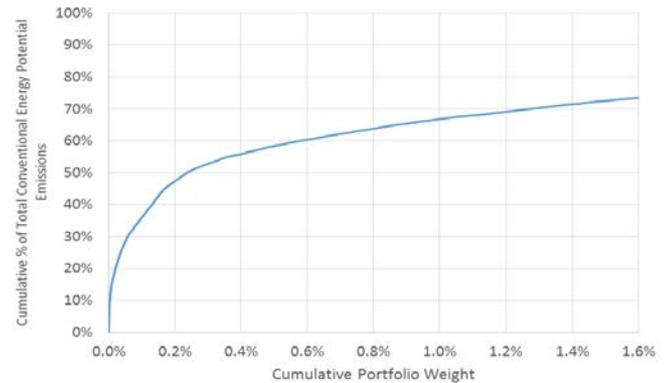
Portfolio carbon foot-printing – where is carbon concentrated?



Scope 1 & 2 Emissions



Reserves Emissions



Our Carbon Footprint: A Preliminary view (30 June 2015)

| | % NAV | Carbon emissions (% of total) | Carbon per NZ\$m invested |
|------------------------------------|-------------|----------------------------------|--|
| Reference portfolio | | | |
| Global Equities | 56% | 75% | 259  |
| Active strategies | | | |
| Timber | 5.9% | 0.4% | 13  |
| NZ Equities | 4.7% | 5.5% | 231  |
| Infrastructure | 4.0% | 2.5% | 119  |
| Equity Beta (EM) | 2.7% | 8.0% | 592  |
| Opportunistic | 2.6% | 1.0% | 77  |
| Active Equities (EM) | 1.4% | 4.1% | 592  |
| Buyout | 0.8% | 1.1% | 259  |
| Energy Growth (Alternative) | 0.7% | 0.2% | 68  |
| Real Estate | 0.6% | 0.8% | 259  |
| Rural Land | 0.6% | 1.3% | 459  |
| Expansion Capital | 0.2% | 0.3% | 259  |
| Energy Growth (Shale) | 0.2% | 0.3% | 259  |
| TOTAL FOR ACTIVE STRATEGIES | 24% | 25% | 206  |
| Opportunities assumed zero | | | |
| Global Bonds | 13.2% | | |
| Global Macro | 2.6% | | |
| Distressed Credit | 1.2% | | |
| Life Settlements | 1.1% | | |
| Natural Catastrophe Reinsurance | 1.0% | | |
| Convertible Arbitrage | 0.1% | | |
| PORTFOLIO TOTAL | 100% | 100% | 196  |

Carbon Footprint Summary:

The Carbon Footprint is a good indicator of carbon risk related to:

- Listed Portfolio represents 75% of emissions – this is the main focus of our reduce strategy.
- Active strategies don't appear to materially alter carbon risk at present (with current assets).
- Further work is required on:
 - How to treat bond holdings;
 - Review & selection of underlying methodologies for active strategies.

Carbon Footprint and Climate Risk: Limitations

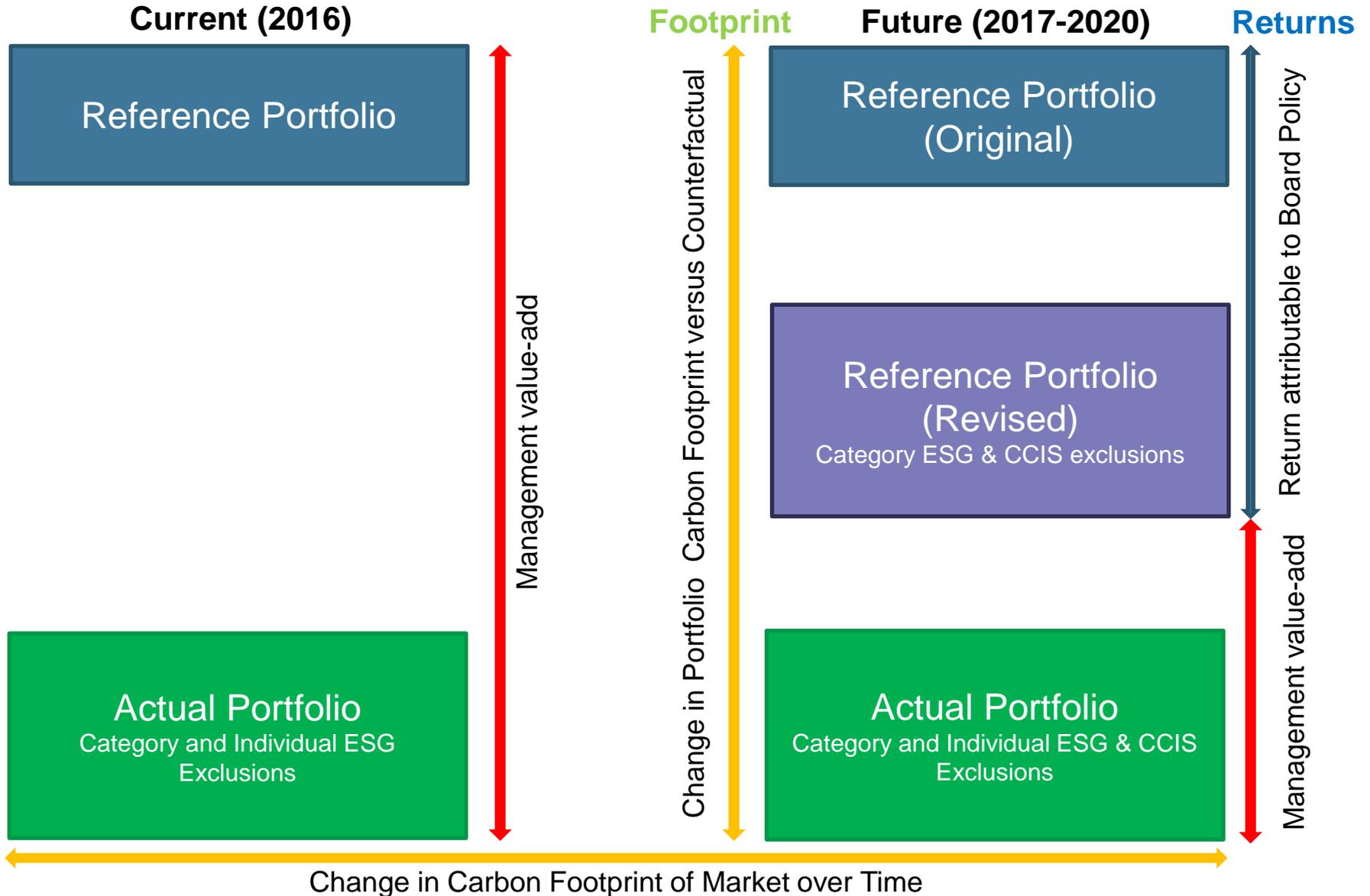
The Carbon Footprint is a good indicator of carbon risk related to:

- those industries/companies most exposed to risk from directly releasing emissions; or that are intensive energy users (Scope 1 & 2 emissions)
- fossil fuel reserves exposure

What the carbon metrics don't capture is:

- risk to industries or companies or assets *reliant on* high emitters or fossil fuel companies, that do not have a high carbon footprint themselves;
- ability for industries or companies to adapt;
- risks from physical, water resource or weather impacts caused by climate change.

Measuring and Comparing the Right Things



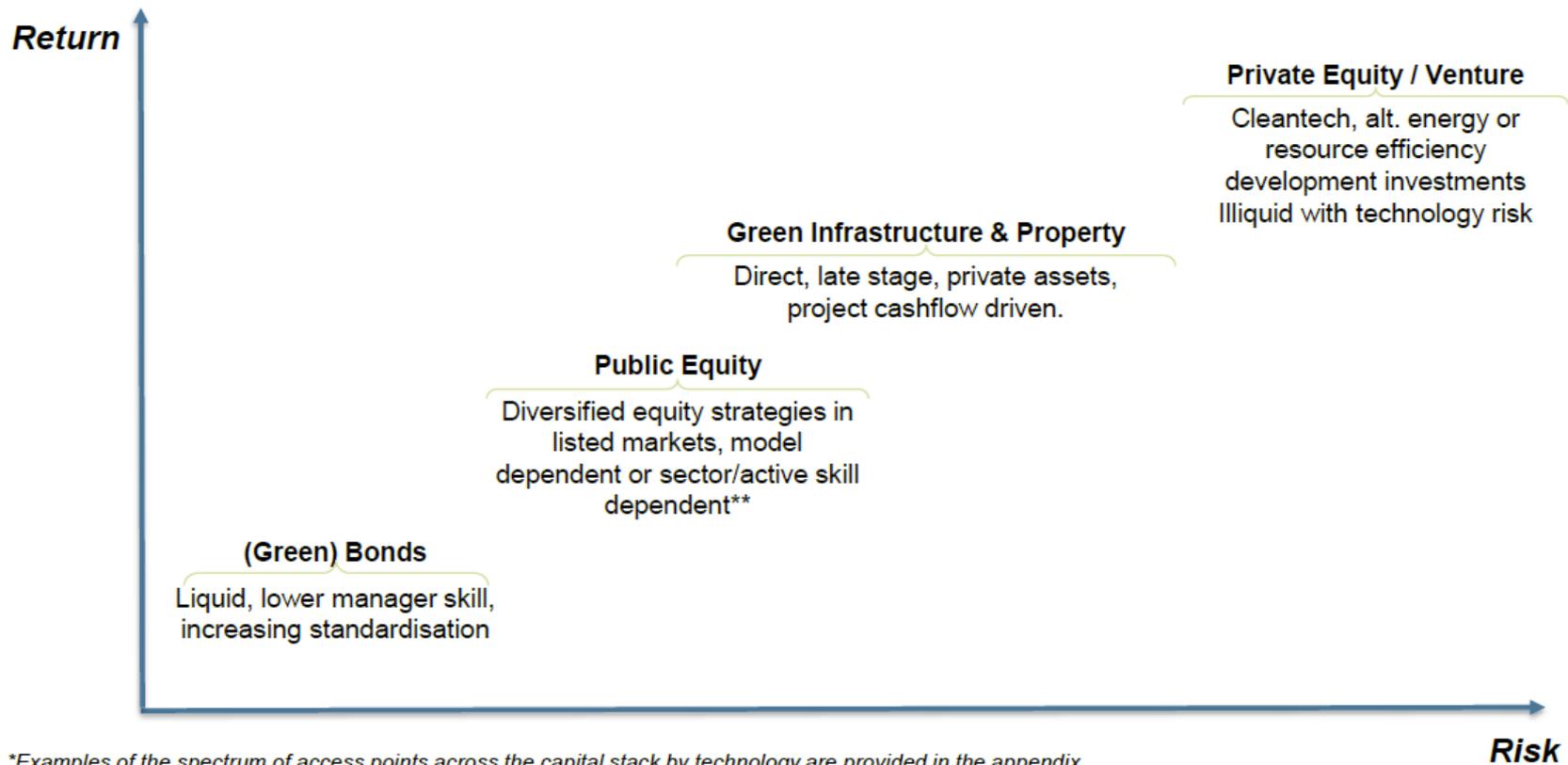
Implementing the Strategy – Key Workstreams Underway

The goal of our climate change investment strategy is to make the Fund more resilient to climate-related risk.

| WORKSTREAM | DESCRIPTION |
|---|---|
| REDUCE: Reduce exposure to fossil fuel reserves & carbon emissions | <ul style="list-style-type: none"> Establishing design principles for reducing exposures to high risk companies across the equity portfolio. Implement reduction in exposure to emissions and reserves across equity portfolio beginning this year. Carbon footprint for passive equities published. Initial assessment of non-passive portfolio exposures undertaken. Designing approach to reducing exposure to carbon emissions across unlisted assets. |
| ANALYSE: Incorporate climate change into our analysis and decisions making | <ul style="list-style-type: none"> <i>Valuation</i> - Developing a methodology to incorporate carbon pricing into valuation models. <i>Scenarios</i> - Considering the return impact on the whole portfolio of various climate change scenarios. <i>Manager Selection</i> - integrate into Manager Selection & Conviction Framework, and ESG clauses in mandates. <i>Physical risks & real assets</i> - Assessment of climate change risks embedded in our real asset holdings, risk of physical damage & resource impacts and potential implications for our Natural Catastrophe exposure. |
| ENGAGE: Manage climate risks by being an active owner | <ul style="list-style-type: none"> <i>Engagement programme: add climate change as a priority focus issue:</i> direct & collaborative engagement to encourage companies to develop robust climate change strategies and to improve reporting. <i>Voting:</i> Review voting guidelines to ensure they encompass climate change considerations. |
| SEARCH: Execution ability and our target operating model | <ul style="list-style-type: none"> <i>Opportunities:</i> Actively seek new investment opportunities suitable for long horizon investors, including in the areas of alternative energy, energy efficiency and transformational infrastructure. Key elements: Opportunity Filter, Spectrum of opportunities, Near & long-term prospects. |

Moving to Full Spectrum of Risk & Return Opportunities

Traditionally, most opportunities were accessed by us via private market equity. We are seeing climate change opportunities increasingly gain breadth across the full risk spectrum from green bonds to private equity and venture capital type investments, making it more amenable to various beta (simple, liquid, cost effective) approaches.*



*Examples of the spectrum of access points across the capital stack by technology are provided in the appendix.

**A systematic, climate-based, equity program is not considered in this report whilst we review if this should be an alternate benchmark.