

A photograph of several white wind turbines standing on rolling green hills under a blue sky with scattered clouds. The hills are covered in lush green grass, and a small stream is visible in the lower left foreground.

INVESTING IN CLIMATE SOLUTIONS FOR NEW ZEALAND



Investor Group on
Climate Change



The Investor Group on Climate Change (IGCC) is a collaboration of Australian and New Zealand institutional investors and advisors, managing over \$2 trillion in assets under management and focusing on the impact that climate change has on the financial value of investments. IGCC aims to encourage government policies and investment practices that address the risks and opportunities of climate change.. www.igcc.org.au

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FOREWORD

Institutional investors and financiers are significant players in the New Zealand economy. Investors are also exposed to the financial effects of both the transition and physical risks of climate change, and are key players in driving a low carbon transition.

We know that a significant gap remains between the level of current global climate investment and the level of investment required to meet targets under the Paris Agreement to avoid 2°C of global warming, and provide the level of adaptation needed in the face of climate change itself. Investors have a vital role to play in unlocking finance and scaling up investment to meet these challenges.

In addition, the recommendations of the Taskforce on Climate-related Financial Disclosures (TCFD), and a growing body of regulatory and legal opinion, provide an increasing imperative for companies to demonstrate how they are managing both transition and physical climate risks. This also presents opportunities to invest in new climate solutions.

In October 2018, IGCC convened a workshop in Auckland to look at how to invest in climate solutions in New Zealand. In doing so, we sought to bring together investors, financiers, and other stakeholders to investigate key challenges and barriers for New Zealand, explore opportunities to scale up climate finance and discuss real world examples of current best practice.

This report captures the current climate finance landscape in New Zealand, some of the key insights to emerge from the workshop discussion and recommendations for next steps which IGCC will take forward.

It comes at a time where there is significant momentum and activity in New Zealand, focused on scaling up the national response to climate change issues across the country.

I would like to thank all of the participants in the workshop who lent their experience, expertise and insights to the discussion. I would also like to thank Justine Sefton, for her support in authoring this report.

IGCC looks forward to continuing to partner with our members, with Government and with other representatives of the financial community as we continue to scale up investment in climate solutions in New Zealand.

Emma Herd,
Chief Executive Officer

INTRODUCTION

In October 2018, the Investor Group on Climate Change (IGCC) convened a stakeholder workshop in Auckland, focused on scaling-up and accelerating low-carbon, climate-resilient investment by New Zealand investors. The aim was to raise understanding of the current state of play and market practice, and to identify barriers and practical solutions. There was broad interest and participation from financial market policy-makers, regulators and participants as well as service providers, academics, NGOs and others.

The workshop coincided with the release of an Intergovernmental Panel on Climate Change special report on the impacts of global warming of 1.5°C above pre-industrial levels and related emissions and system transition pathways, which underscored the imperative, and urgency, of scaled-up action on mitigation *and* adaptation and the need for *transformational* change.

New Zealand Prime Minister Jacinda Adern has described climate change as the “nuclear free moment” of this generation. Consistent with the country’s international commitments, the Government seeks to put New Zealand on a pathway to a low-carbon future - aiming to reduce emissions to net zero by 2050 - and to facilitate a timely, managed and just transition as part of a broader sustainability agenda.

There is a reinvigorated programme of work across government, in tandem with strong private sector leadership on the issue. *Financial market* policy and regulation – historically neglected in climate policy frameworks – has the potential to have a powerful catalytic effect, along with increased and more innovative public finance.

Economic transformation will require financial system transformation, and a major redirection of public and private capital over a relatively short period of time. Workshop participants were reminded of the estimated scale of additional investment needed globally to meet the Paris Agreement goals, and corresponding scale of the investment opportunity that presents.

Currently, financial markets in New Zealand – and globally - are largely misaligned with climate change imperatives. There is a capital misallocation, due to issues ranging from market short-termism, asset mispricing, lack of information and awareness across financial markets and a number of other systemic barriers.

This IGCC briefing paper:

- Summarises the relevant New Zealand policy, regulatory and market landscape, with case study examples of local ‘climate finance’ activity (Part 1).
- Captures the key issues, insights and ideas that emerged from the workshop presentations and discussion of the challenges that investors are experiencing, drawing upon this to suggest key barriers and enablers, as well as potential practical solutions (Part 2).
- Provides some broad recommendations on follow-up government and market action (Part 2).

It does not seek to represent a complete state-of-the-market assessment or barrier/gap analysis. Rather, it gives a flavour of the current landscape and an indication of priority areas for focus.

DEFINING 'CLIMATE FINANCE'

There is no universally-applicable definition of the term 'climate finance'. It is currently used in relation to a wide variety of activities in the market, and effectively determined by what the market recognises as climate finance, as well as eligibility for government funding or incentives.

The UNFCCC definition is broad and principally relevant to Parties' accountability under the Paris Agreement, and how that is translated into domestic policy and regulatory frameworks. Climate Policy Initiative produces regular 'Global Landscape of Climate Finance' reports, tracking and analysing climate-related (public and private) investment flows. There are various relevant open-source or proprietary frameworks available, or under development, for defining or classifying green/climate-compatible investments (including the Climate Bonds Initiative taxonomy, for example). Some are limited to climate solutions; others encompass emissions reduction activities also. There are moves internationally towards harmonisation. New Zealand's Productivity Commission has recommended defining and developing a clear taxonomy for what constitutes 'low-emissions investment'.

In this paper, climate finance encompasses both mitigation and adaptation investments, and includes risk/negative impact reduction as well as positive solutions.



NZ SUPER'S CLIMATE CHANGE STRATEGY AND INTEGRATION APPROACH

NZ Super Fund's Climate Change Investment Strategy is anchored in its mandate and investment beliefs. The overarching strategy objective is to make NZ Super more resilient to the impacts of a low-carbon transition and the consequences of unavoidable climate change. A 'whole of portfolio' approach was applied, and a 'whole of team' approach to developing and implementing the strategy.

NZ Super believes that climate change presents material long-term risks for which it will not be rewarded, because markets are under-pricing these risks at present. This is partly because the time horizon over which the effects will manifest is too long for most market analysts. Therefore, ignoring climate change in its investment decisions could expose NZ Super to "undue risk". Managing climate change risk is regarded as a low-cost insurance policy. NZ Super is also cognisant of the New Zealand Government's policy and international commitments on climate change in relation to the "avoiding prejudice to New Zealand's reputation" leg of its mandate. NZ Super views climate change as different from other themes, given the multiple drivers, variable impacts across asset classes, sectors and geographies, and inter-generational and cross-boundary dimensions. Hence, no single metric or tool can capture it.

Consideration and integration of climate change risks across the portfolio is a long-term work programme for NZ Super. There are four main parts to its strategy:

1. Reducing portfolio exposure to fossil fuel reserves and carbon emissions in its equity investments (applying a customised benchmark), and a tailored approach to reduction of other relevant portfolio exposures;
2. incorporating climate change risk into investment analysis and decision-making (including valuation models, risk allocation and manager selection/mandates);
3. managing climate risks through being an active owner, including making it an engagement priority and reviewing voting policy and guidelines; and
4. actively seeking out new investment opportunities, across the capital stack, including in the areas of alternative energy, energy efficiency and transformational infrastructure.

As well as being a leader in the NZ market (including through involvement with the Aotearoa Circle's Sustainable Finance Forum), NZ Super has championed climate change as a member of the International Forum of Sovereign Wealth Funds and creation of the One Planet Sovereign Wealth Fund Working Group.

PART 1:

CURRENT CLIMATE FINANCE LANDSCAPE IN NEW ZEALAND

RELEVANT POLICY, REGULATORY AND MARKET DEVELOPMENTS

New Zealand is at a pivotal point in climate finance-related policy and market development. There are multiple relevant government and stakeholder processes and initiatives operating in parallel.

The Government is preparing its response to the **Productivity Commission's final report on a Low-emissions Economy¹**, the outcome of a wide-ranging inquiry that looked at mitigation pathways, emissions pricing, innovation, investment, laws and institutions and measures in key sectors. Relevant recommendations included: strengthening the national innovation system, and making low-emissions innovation a high priority with significantly increased resources; aligning public project and programme funding with a low-emissions transition; clearly defining and identifying a taxonomy for what constitutes low-emissions investment; and introducing mandatory climate change financial disclosure by firms, specifically endorsing the framework developed by the Taskforce on Climate-related Financial Disclosures (TCFD).

The Government is also considering the recommendations of the **Climate Change Adaptation Technical Working Group² (TWG)** on adapting to climate change in New Zealand. Recommended principles included: anticipating change and focusing on preventing future risks from climate change rather than responding as the changes occur; taking a long-term perspective when acting; and integrating consideration of climate change risks and future adaptation needs, costs and benefits into public policy, planning and investment decisions.

Recommended actions included: better national adaptation planning and risk assessment; better, and more accessible, information for decision-making; stronger leadership and prioritisation of adaptation by government; building capacity and capability for adaptation; and setting up a specialist expert group to define funding mechanisms to support adaptation action. Defining funding arrangements would involve an assessment of: adaptation costs (including costs of inaction); who should bear these costs and how they will be equitably shared across the public and private sectors, and between generations; current funding sources and lessons from other countries; and future funding options.

Parallel policy or legislative processes include³:

- The Zero Carbon Bill on setting a new 2050 'net zero' target, emission budgets and plans to achieve, establishing an independent Climate Change Commission (CCC) to advise the Government, and a systematic approach to adaptation;
- An interim Climate Change Committee (iCCC) – precursor to the CCC - tasked with developing evidence and analysis on the priority issues of incentivising agricultural emission reductions and getting to 100% renewable electricity by 2035;
- An inter-agency Transition Hub to develop, analyse and advise on transition pathways, a 'just transition' and economic impacts;
- Proposed post-2020 NZ Emission Trading Scheme (NZ ETS) reforms to strengthen and improve its operation and potentially extend surrender obligations to biological emissions from agricultural activities; and
- Launch of the new Green Investment Finance Fund Ltd (GIF) to stimulate low-carbon innovation and investment and new R&D tax incentives for business.

These will take into account, among other things, the recommendations of the Productivity Commission and Adaptation TWG. The Government is also considering the role of the Reserve Bank of New Zealand (RBNZ) in monitoring and managing climate change related financial system risks, as part of Phase 2 of the Reserve Bank Act review. RBNZ Governor, Adrian Orr, has referred to climate change risks and made the case for longer-term business and investment horizons in a number of recent speeches.⁴

Industry-led initiatives include the recent launch of the Climate Leaders Coalition⁵ by leading corporates, and the Sustainable Finance Forum⁶ (a flagship initiative of the newly-created Aotearoa Circle); and a joint initiative by Government and a number of other international investor organisations (including IGCC) on development of a sustainable finance roadmap for New Zealand.⁷

NEW ZEALAND BOARDROOMS – GOVERNANCE, ACCOUNTABILITY AND DISCLOSURE

There is growing awareness and recognition in the New Zealand market that climate change is a financially-material business and investment issue, increasingly driven by stakeholder values and demand.

Internationally, climate change is now widely regarded as essential expertise for boards and directors of both financial and non-financial corporates. Understanding and managing climate change related risks and opportunities is seen as central to the discharge of governance, fiduciary and stewardship duties, with the spectre of directors' personal liability in the future, for failure to properly consider and disclose.⁸

Companies need to consider both the physical and transition (policy/legal, technology, market, reputational) impacts, in relation to their products and services, operations and supply chain, and implications for financial performance as well as legal and social licence to operate. Investors need to consider the implications for asset values and the discharge of their investment mandates and duties, as well as reputational and competitiveness impacts as they come under direct scrutiny from their own stakeholders. Both need to consider the systemic risk dimension (i.e. risks to economic and financial system stability, as well as social and environmental system constraints), in addition to company/

portfolio-specific impacts.

There are strong expectations that this global trend will be reflected in New Zealand practice. Local legal experts have indicated that they expect that New Zealand will follow this “global accountability trend”. Arguably, there is already a requirement to consider these issues alongside other factors – irrespective of views on climate science or moral responsibility. It is implicit in existing investor, director and trustee duties (under the Companies Act 1993, Financial Markets Conduct Act 2003 and Trustee Act 1956), and explicit in NZX corporate governance guidance. Even so, there is a case for financial regulators to step in, to clarify or make this explicit, and to send a strong signal to the market.

Despite high profile lawsuits against directors overseas⁹, there has not (yet) been the same level of debate, or stakeholder pressure, in the New Zealand market. There has also been arguably less debate about transition and systemic risk. The issue is climbing the agenda in New Zealand boardrooms, although there has been a general disparity in response between large firms and SMEs (the latter, due to perceived relevance or limited resources).

There are signs of a shift in behaviour of consumers of (financial and non-financial) products and services. Whereas large corporates have been active in pursuing sustainability or environmental initiatives, there is evidence that smaller companies and individual households are also becoming more engaged. There are also various resources and initiatives such as BetterSaver, Responsible Returns and the Mindful Money campaign¹⁰, which are aimed at informing consumers and generating demand for sustainable investment options.”

Mandatory climate reporting could now be on the horizon. Regardless, the threat of adverse ratings or ‘hostile analytics’ by research houses and ratings agencies provides an incentive to disclose.

Better information is essential to enable market internalisation of climate change related risks, opportunities and impacts, to encourage investment that is aligned with low-carbon transition, and enable more informed decision-making by investors, consumers and government.

International best practice is heading towards mandatory climate-related disclosure; the issue being whether it is too soon to be prescriptive and weighing that up against the benefits of a harmonised approach to promote comparable, decision-useful information.

The (voluntary) TCFD¹¹ framework is becoming the internationally-accepted approach for disclosure on exposure to, and management of, climate change related (physical and transition) risk and opportunities and associated financial impacts. It applies to both non-financial companies and investors. Taking this a step further, the French Government has introduced legislation making climate change related disclosure mandatory, and requiring institutional investors to explain how their policies align with the country’s climate goals and national strategy for a low-emissions economy.¹²

Regarding current climate disclosure practice in New Zealand, workshop participants observed a disparity in corporate climate reporting, and reporting quality, especially between large companies and SMEs. Issues of non-reporting or over-reporting (“telling you everything” due to fears of personal director liability) and green-washing (“telling investors what they want to hear”) were also flagged.

There were different views among workshop participants on the best approach for the New Zealand market in the future. While market leaders will respond voluntarily, some thought that regulation may be necessary for ‘laggards’. Others supported a transition (learning and experimentation) phase

for business, with the 'threat' of regulation. In terms of approach, it was observed that the horse has probably already bolted in favour of the TCFD framework.

KEY AREAS OF INVESTMENT RISK AND OPPORTUNITY IN NEW ZEALAND

TRANSITION RISK/OPPORTUNITY

Globally, a successful transition hinges on rapid energy sector transformation, but New Zealand's mitigation priorities are different given its relatively unique emissions profile compared to other developed countries. Key sectors identified by the Productivity Commission were: land use, transport, agriculture, heat and industrial processes, waste and the built environment. Recommended priority measures included: (1) a rapid and comprehensive switch to electric vehicles and a switch away from fossil fuels in providing process heat for industry; (2) substantial levels of afforestation; and (3) changes to the structure and methods of agricultural production, including diversification of land use towards more horticulture/cropping and greater adoption of low-emissions practices on farms.

PHYSICAL RISK/OPPORTUNITY

According to the Adaptation TWG, New Zealand will experience increases in the frequency and intensity of extreme events such as higher temperatures, flooding, droughts, and wildfires (acute risks), as well as sea-level rise, and warmer and more acidic oceans (chronic risks). And there is already evidence of this. These changes threaten the country's coastal communities, cities, infrastructure, human health, biodiversity, oceans, and natural resource-based economy. The costs of action and inaction are likely to be large in scope and scale, across many sectors and environment.

Workshop participants noted that New Zealand has the 7th largest coastline in the world, and most of the country's infrastructure is located in coastal or low-lying areas. They flagged the implications of physical and transition risk for key New Zealand industries such as agriculture and tourism - to which most investors are exposed - and for international travel and exports.

ECONOMIC/FINANCIAL SYSTEM RISK

The Productivity Commission observed that New Zealand currently has no whole-of-economy understanding of the level of financial exposure to climate risk and noted the important role for central banks in assessing financial system risk exposure. The Adaptation TWG concluded that the country needs to confront the issue of allocation of risk, costs and benefits (between public and private sectors, and within and between generations) - who pays for what and what the funding mechanisms should be. It noted that risk-based insurance is likely to become increasingly expensive and/or harder to obtain in high-risk locations, placing pressure on public agencies (and in turn taxpayers and ratepayers) to fill the gap. There is also a concentration of risk in a small number of banks and insurance companies in New Zealand.

CURRENT STATE OF PLAY AND MARKET PRACTICE

While there are some market leaders (see case studies for examples), overall, the New Zealand financial market is still at relatively early stages of responding to climate change risk and opportunity.¹³

The managed fund industry in New Zealand is small compared to banks, but growing. There is untapped potential, in particular, in the (growing) KiwiSaver¹⁴ market. The next statutory review of KiwiSaver default provider rules provides an opportunity for the Government to set the benchmark on climate/ESG for this market segment.

Some investors are pursuing a portfolio/enterprise-wide integration approach, encompassing portfolio construction as well as other levers (voting and engagement, policy advocacy, collaboration and reporting). Others are introducing specific climate-related investment strategies, products or services.


Approaches include: ethically-based exclusions of fossil fuels; climate risk/carbon reduction investment strategies (i.e. divestment or down-weighting of carbon-intensive/fossil fuel stocks); and value-adding/climate positive investment strategies (i.e. allocation to mitigation/adaptation solutions).

The response of the banking sector will be particularly important, given its financial market share in New Zealand and exposure of lending portfolios to property and agriculture (mostly dairy) assets. The financial sector in New Zealand is dominated by banks, which own around two thirds of financial assets. The New Zealand banking system is also highly concentrated; with the four large Australian-owned banks (ANZ, ASB, BNZ and Westpac) accounting for around 87% of bank lending. Capital markets are relatively less developed.

In terms of banks' risk exposure (and potential for positive impact): around 61% of bank lending is to the household sector; the vast bulk of which is secured against housing assets; lending to the agriculture sector accounts for around 14% of total lending, of which the dairy sector accounts about for two-thirds; lending to the business sector accounts for 25% of total bank lending, around 34% of which is property related.¹⁵

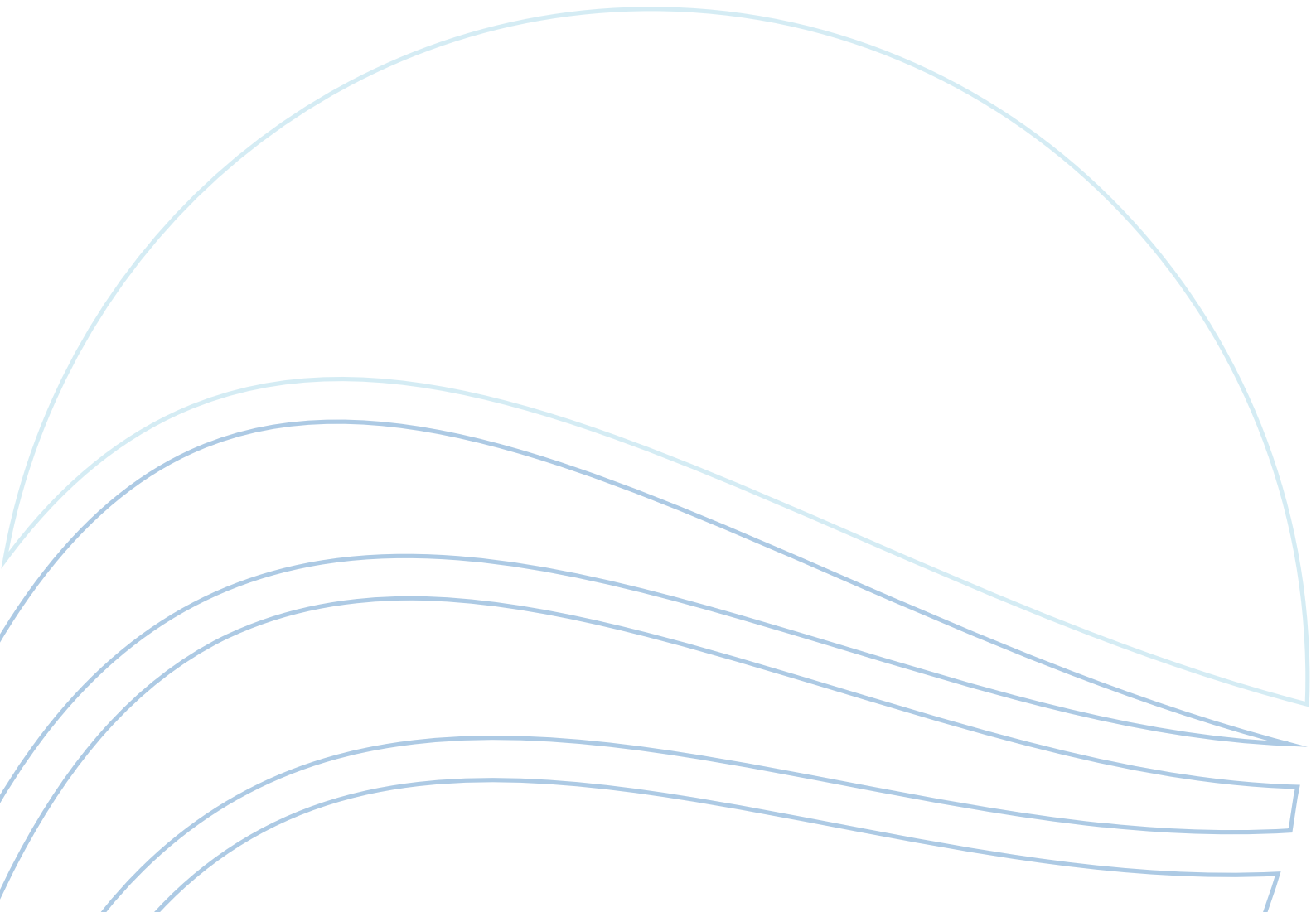
New Zealand's private insurance sector is small by international standards, with general insurance making up around 63% of that market. Around half of the licensed insurers are foreign-owned, and account for about 85% of total assets. Government owned general insurers are the Accident Compensation Corporation, the Earthquake Commission and Southern Response Earthquake Services. Workshop participants referred to insurance companies as being "on the front lines" of climate change in terms of physical risk exposure, as well as exposure of their investment portfolios. It was commented that there has not been the same level of leadership from New Zealand's insurance sector on climate change, compared to international counterparts.¹⁶

Regarding climate solutions investment in New Zealand, workshop participants said that the majority of money is still going into mitigation – and most of that to renewable energy and forestry, although the opportunities are starting to feel more real/tangible in other sectors (especially transport).



There are ongoing investment challenges, particularly for agriculture (much still at early R&D stage), infrastructure and adaptation. Private markets are more challenging, especially for early growth stage companies – bridging the divide between R&D/VC and public markets - and the alternatives segment of the market is still very small. More broadly, there are issues of investment scale, underfunding of infrastructure (generally) and a relatively weak innovation system.

It was commented there has been limited public climate finance to date, and limited central/local government appetite for PPPs. Also, little experience and experimentation in the New Zealand market generally, with innovative climate finance instruments and approaches not yet widely adopted. It is understood that the GIF is intended to address some of these gaps and weaknesses. Earlier this year, Auckland Council issued the country's first green bond – an example of innovative financing of public infrastructure in line with low-carbon transition.



WESTPAC NZ'S CLIMATE CHANGE STRATEGY AND INTEGRATION APPROACH

Westpac believes that the finance sector has a major role to play in helping New Zealand transition to a low carbon economy. Westpac's climate change strategy is guided by a set of core principles: transition to a net zero emissions economy is required; economic growth and emissions reductions are complementary goals; climate-related risk is financial risk; addressing climate change creates financial opportunities; and disclosure matters. The overarching strategy objective is to help the bank's customers manage the transition and contribute to the redirection of capital investment flows to the parts of the economy where it is needed. Specific measures and targets include:

- Integrating climate change risk and opportunity into lending and investment decisions;
- Setting green growth lending targets. (The current target is to provide \$2 billion in lending to climate change solutions by 2020), and substantially reducing lending to fossil fuels.
- Developing products that help customers reduce the upfront capital costs of reducing emissions – e.g. Energy Efficient Leasing product (including electric vehicles).
- Regularly publishing lending exposures to both businesses providing climate change solutions and those involved in fossil fuel extraction and production.

Westpac is a founding partner of both the Climate Change Leaders Coalition and the Aotearoa Circle's Sustainable Finance Forum. It also played a key market-making role for the NZ ETS.





MORRISON & CO'S GROWTH INFRASTRUCTURE FUND

Alternative asset manager, Morrison & Co, launched a \$1 billion 'green' infrastructure fund for Australia earlier in 2018, targeting social and economic infrastructure assets with potential for significant emissions cuts and improvements in energy efficiency. The Clean Energy Finance Corporation (CEFC) took a cornerstone stake, among a group of institutional investors.

Decarbonisation is a key investment strategy for Morrison & Co, based on the belief that the cost of emitting carbon is unpriced or mispriced by markets. It considers that an understanding of climate risks and opportunities is an essential part of due diligence and asset management for any kind of infrastructure investment.

The 'Growth Infrastructure Fund' will acquire and develop a diverse range of essential assets, from hospitals to data centres, retirement and aged care accommodation to student housing and renewable energy. Over time, the fund will look to progressively introduce internationally-recognised science-based targets to build a zero emissions portfolio. It will also draw on relevant Australian/international standards to set best-practice sustainability goals (including those of the Infrastructure Sustainability Council of Australia, the National Australian Built Environment Rating System and the Nationwide House Energy Rating Scheme, Green Star and GRESB).

Morrison & Co is continuing to explore sustainable investment opportunities in New Zealand and other geographies also.



AUCKLAND COUNCIL'S GREEN BOND ISSUANCE

Auckland Council was the first domestic borrower to issue a green bond in New Zealand, raising \$200 million in June 2018 which it intends to use to fund electric trains and associated infrastructure. The bonds are certified by the Climate Bonds Initiative (CBI) and quoted on the NZX Debt Market.

This was the first bond issuance under the Council's Green Bonds Framework (GBF), which is aligned with the International Capital Markets Association Green Bond Principles and also uses asset criteria set out by the CBI. The Council's GBF provides for the financing of eligible projects or assets that deliver positive environmental outcomes, or the financing of corporate debt that supports that. Eligible assets are those that fall within eligible sectors and meet specified eligibility criteria (both may be amended). Current eligible sectors are: renewable energy, energy efficiency, efficient buildings, waste management, sustainable land use, low carbon transportation, climate change adaptation and sustainable water management.

The Council has also implemented processes to ensure that green bond proceeds are allocated, tracked and reported separately and in accordance with the GBF. The Council will report to investors on the environmental outcomes that have been delivered, and make information publically available also.

The Council is responding to what it sees as clear appetite in the market for green investment, to help meet its sustainability objectives while delivering the billions of dollars of investment needed in the city's infrastructure over the coming decade. Green bonds will be considered, among other climate finance mechanisms, as part of the funding options for the Auckland region's Climate Change Action Plan (currently under development by Auckland Council).

PART 2:

CLIMATE FINANCE CHALLENGES & SOLUTIONS

In convening representatives from the finance sector for a workshop in Auckland in October 2018, IGCC was seeking to address the question: how do we increase investment in climate finance solutions in New Zealand?

The Tables in the Appendix to this report were used as the basis of discussion, and set out commonly identified types of barriers to, and enablers of, climate-compatible investment by private investors. The workshop discussion touched on many of these - as well as specific issues, insights and challenges - for the New Zealand market, based on what local investors are experiencing.

GENERAL BARRIERS AND ENABLERS

A. MOTIVATION

There is growing awareness and understanding, in the New Zealand market, of the relevance of climate change to *mainstream* (not just ethical/impact) investors, and of the various regulatory and market drivers to respond – i.e. under *current* investment mandates and legal duties. Further efforts are needed, however, to engage and educate the broader investment community, and to build capability generally.

Investment horizons and tenure remain an issue - compounded by (mis)perceptions about the proximity of risks in some cases. *How* investors respond will depend, among other things, on their beliefs about market pricing of climate change-related risks and opportunities, and the role of investors to contribute to societal goals and systemic risk management. The latter will be shaped by evolving stakeholder values and expectations – potentially reflected in future policy and regulatory interventions and/or the evolution of market best practice.

There was workshop discussion on the role of New Zealand financial market policy, regulators and regulation to drive change faster. The general lack of substantive leadership and engagement in this area, to date, was commented on. Specifically, there is heightened anticipation and market expectation that the RBNZ will take more of a public leadership position, in keeping with its international counterparts.

Workshop participants observed that there has been a lack of pressure on New Zealand investors (and companies) from consumers/civil society, and a lack of pressure on the Government for reform, to date. Also, a lack of demand for sustainable investment products and services. But that is starting to change.

B. CONFIDENCE

There is increased market certainty about the long-term climate policy and carbon price direction, given recent policy developments and general bipartisanship on the issue. However, workshop participants considered that there is a need for:

1. More detailed, and integrated, transition (mitigation and adaptation) planning - including consideration of negative social impacts and distributional issues, and a joined-up effort across government.
2. Development of a comprehensive, coordinated national climate finance strategy, encompassing mitigation and adaptation and with an enduring architecture. This could be designed through a single, multi-stakeholder and cross-party supported platform or process, ideally led or driven by financial market policy makers/regulators (i.e. Treasury, the Ministry for Business, Innovation and Employment, RBNZ and the Financial Markets Authority).
3. Broad engagement with, input from, and collaboration across the investment community on the above. Appropriate private finance sector representation on associated governance structures and expert advisory/technical working groups.

Decisions on New Zealand's 2050 target and emissions budgets and on NZ ETS settings affecting the supply, demand and price of units (auctioning, linking, price ceiling, free allocation and agricultural emissions) - and their interaction - will affect the future price of carbon that is felt by the market and improve long-term price visibility. In both cases, access to, and recognition of, international units towards compliance will be a key factor. There are also questions about whether and how to internalise the broader social cost of carbon (which may be taken forward through Treasury's Living Standards Framework project on broader measures of economic wellbeing).

There appears to be growing market appetite for low-carbon, climate-resilient investment, but with ongoing challenges in translating that into action and doing investment deals. The biggest challenges or concerns identified by workshop participants included: integrating consideration of climate change factors by their organisations; commercial viability or attractiveness of, and access to and execution of, climate solutions investment opportunities; and lack of industry experience, skills and resources.

C. INTEGRATION

Scaling-up climate finance will require consideration of climate change risks, opportunities and impacts – and ideally also consistency with national climate goals and adaptation needs – to be mainstreamed into public policy and finance and private investment decision-making. This entails integration into governance, strategy, operations and culture, top-down and across organisations. Through ownership and buy-in, accountability and incentives, policies, processes and practices, training and recruitment.

Workshop participants shared their integration experiences and insights. They emphasised the importance of leadership from the top (Board, CEO, senior management) and alignment of KPIs across the organisation. Also, setting clear objectives, principles and (science-based) targets, and investing in time, capability and resources. This includes specialist expertise on boards, or access to experts in an advisory capacity, and education and training for directors.

It was commented that investors will need to learn to invest in an environment that is changing: where the drivers of asset values are changing and the value of assets on balance sheets will change as the market gets more effective at internalising climate factors. They will need to understand transition pathways at the sector and company level, as this will become very important in terms of where to invest and reallocate. Engagement and proxy voting will also play an important role, for positive impact and informed decision-making.

D. COMMERCIAL VIABILITY/ATTRACTIVENESS, ACCESS AND EXECUTION

Workshop participants all noted that there is a dearth of investment-grade opportunities in climate solutions in New Zealand. This is due to a mismatch of risk appetite and return requirements, compounded by challenges of measuring, quantifying and pricing climate-related risk, and finding investments of appropriate scale. There is also a shortage of product and lack of a pipeline of investible projects/deals or suitable vehicles to access them. Specific barriers for specific products and market segments were mentioned, e.g. current product disclosure requirements for green bonds (see below) and liquidity restrictions for KiwiSaver schemes.

A lack of diversification across different sectors, asset classes and financial instruments and adaptation (as well as mitigation) solutions was also identified. There are emerging (public and private market) thematic funds and indices available for international markets. But little product development for the New Zealand market, and no low-carbon index offerings for the NZX were identified to date.

Additional transaction and assurance costs, regarding impact measurement and verification, can act as another disincentive to climate solutions investing. Workshop participants commented on the perverse higher burden for green, compared to conventional, bonds and other investment products. It was suggested that consideration/demonstration of green credentials should be mainstreamed into all investment activity and products and related regulatory requirements.

Workshop participants commented that sometimes misperceptions about costs, risk and performance can be a factor. In other cases, it is just very hard to make the numbers stack up. They emphasised the importance of applying the true cost of carbon. Also, the challenges of monetising broader impacts, benefits and dependencies - noting the relevance of ecosystems services literature. And that investors shouldn't under-estimate stakeholder (consumer/ratepayer/taxpayer) 'willingness to pay' for positive E&S outcomes, as long as there is trust and transparency about how money being spent. It was commented that consumer demand "creates commercial viability". And reminded that climate solutions investing is not all about technology innovation; it's also about channelling money into existing, proven technologies.

Further, in addition to technology/business model innovation, the market needs *climate finance* innovation. Workshop participants saw an important role for blended finance and other vehicles (including aggregation) to promote positive investment by private investors. It was commented that there has been limited public climate finance in New Zealand to date, and limited central/local government appetite for PPPs.

There is also little experience and experimentation with innovative climate finance instruments and approaches (c.f. overseas). There is a need for partnerships, platforms, products and pilots – and recognising the strategic value of learning. "Success breeds enthusiasm to do more", according to one workshop participant, noting the level of interest generated by Auckland Council and Contact green bond issuances.

Finally, investors in the workshop noted that there is some uncertainty as to where climate investments fit within a diversified portfolio designed through a Strategic Asset Allocation (SAA) process with required return, risk and correlations data for assets.

E. CAPABILITY AND RESOURCES

A cross-cutting issue for the industry (and especially for smaller organisations) identified by workshop participants is lack of skills, experience and resources. Practical guidance on climate investment policy development is needed, as well as fora for peer learning and exchange. Also, investment in specialist expertise as part of recruitment and procurement policies. In addition, measures to raise capability and skills across business, finance and accounting sectors generally, including through professional training and educational institutions.

SPECIFIC ISSUES, INSIGHTS AND CHALLENGES

ADAPTATION

New Zealand needs to substantially increase investment in climate change resilience and adaptation infrastructure and technologies, including natural ecosystem preservation. For commercial investors, this is complicated by the issue of generating an adequate return.

The Adaptation TWG identified a number of barriers and disincentives, including: lack of leadership; fragmented governance and policy arrangements; poor information, planning and risk assessment; and cultural attitudes and institutional practices. It observed that New Zealand lacks a culture of anticipatory funding of future risk. There is a reliance on, or expectation of, government compensation or insurance cover, and a lot of risk transfer, e.g. local government allowing building in low-lying, coastal areas.

The necessary scale of anticipatory funding is beyond the financial capacity of government and tax/ratepayers. Stakeholders need to confront the issue of allocation of risk, costs and benefits (within and between generations), who pays for what and what the funding mechanisms should be.

Workshop participants also discussed the need to approach mitigation and adaptation financing in an integrated manner (i.e. through combined low carbon and climate resilient investment opportunities) in many cases.

AGRICULTURE

Non-CO₂ gases pose the biggest challenge for New Zealand, in particular, nitrous oxides and methane from fertiliser use and dairy farming. Mitigation options range from changes in farming practices, including fertiliser use and better soil carbon management, to destocking/premium farming and plant-based proteins, to innovations targeting ruminant livestock emissions.

As well as challenges in finding investible opportunities in the agriculture sector (much of it is still early R&D stage, disaggregated or difficult to monetise), investors face uncertainty over:

4. the future treatment of short vs. long-lived greenhouse gases, i.e. whether the Government will apply a 'two-basket' approach and the amount and pace of non-CO₂ emission reductions within that (see above); and
5. application of emissions pricing to biological emissions from agriculture, through the NZ ETS or a separate pricing mechanism. This determines the strength of the near-term investment signal for agricultural emissions solutions as well as forestry.

FORESTRY (LIABILITY OR ASSET)

Better incentivising sustainable commercial forestry as well as afforestation/reforestation may help address dairy intensification and present investment opportunities in their own right. Inclusion of forestry in the NZ ETS prompted a surge of planting during the early days of the scheme, but policy uncertainty and low New Zealand Unit (NZU) prices/price volatility significantly dampened interest thereafter. The Government is looking at changes to the accounting approach and improvements to operational settings for forestry, as part of a broader package of NZ ETS reforms under consideration. Combined with proposed unit supply and price management measures, this could strengthen the signal to forestry investors. The Government has also launched a new Planting One Billion Trees grant-funded programme, however it remains unclear at this stage how this will interact with the NZ ETS.

LOW-CARBON ENERGY AND TRANSPORT

Technologies, systems and infrastructure that optimise New Zealand's renewable energy endowment and largely renewable national electricity grid are a key area of opportunity. Among other things, the country is strategically placed for electrification of transport and the Government has clearly signalled its intentions on that front. Auckland Council's first green bond issuance was used to fund electric trains and associated infrastructure. Contact Energy's Green Borrowing Programme is a (world) leading innovative financing approach for renewable electricity.

GREEN BUILDINGS (NEW-BUILD AND RENOVATIONS)

New Zealand has a legacy of poor energy efficiency, insulation and environmental performance across its existing building stock. There is also a significant housing supply shortage at present. Government-driven efforts to tackle both, combined with growing market demand for green buildings generally, creates risk and opportunities. The NZ Green Building Council (NZGBC) promotes the use of proven international certification methods adapted for New Zealand conditions (Greenstar, Homestar and NABERSNZ), which will also make eligibility for green bonds/mortgages more likely.

NZGBC report a significant increase in uptake and fit-outs from previous years. A challenge has been engaging government on incorporating this into a unified national building code, along with market misinformation about the additional costs to upgrade buildings from building code-compliant standards.

INFRASTRUCTURE (CROSS-CUTTING)

Infrastructure has the biggest potential to make a difference, according to some workshop participants; but it is a matter of opening up opportunities for investment. Morrison & Co found there was huge appetite for their (Australian) green infrastructure fund – which they hope to replicate in New Zealand – but it needed a cornerstone investor to proceed. They also found that the due diligence considerations were significant and that verification (demonstrating 'additionality') is their biggest concern, noting the skills required.

Workshop participants flagged this as a key area for blended finance approaches, especially as much of it concerns public infrastructure. Auckland Council's Green Bond Framework provides a model for other public bodies. The Government's proposed GIF could play an important role also. There is currently no (public) infrastructure fund in New Zealand, and the NZ Venture Investment Fund's mandate excludes infrastructure.

GREEN BONDS

New Zealand has been slow on the uptake with green bonds compared to Australia and other markets. The country's first green bond issuances have generated a lot of interest and appear to be creating a "halo effect" with equity investors also. New Zealand's regulatory requirements for green bonds were flagged, by workshop participants, as a potential barrier. Specifically, the requirement to produce a Product Disclosure Statement, or PDS, for new green bond issuance. Auckland Council found that the PDS requirements were the biggest cost of its green bond issuance. By setting up its Green Bonds Framework to be applicable to a range of different green bond types, this will at least be a one-off cost to be applicable to a range of different green bond types, so this will at least be a one-off cost. The assurance costs were smaller, in part because the Council started with a relatively simple project.

PRACTICAL SOLUTIONS

SUMMARY OF KEY THEMES


Workshop participants had a wide-ranging discussion, canvassing the nature of the investment challenge (and opportunity), market development issues and structural issues relating to the doing of investment deals. The following key themes emerged:

System lens: This is a systemic problem, requiring a systems solution. A comprehensive, whole-of-government strategy on climate finance – including the lever of financial market policy and regulation - and a whole-of-market response is required. As well as addressing individualised impacts, this will involve grappling with the issue of systemic risks and dependencies and inter-generational equity, and how to allocate that and internalise into policy and investment decision-making in practical terms - in turn, requiring better information. Companies and investors can't unilaterally manage system risk exposure, and research suggests that they can't fully avoid or hedge against it either; a collaborative stakeholder response is needed. They therefore have a shared interest - and arguably, moral responsibility - to contribute to system risk management.

Mainstreaming: Climate change has become a mainstream issue. The next step is mainstreaming consideration of climate change related risks and opportunities into policy, business and investment decision-making and disclosure, and valuing contribution to systemic risk management. Prioritisation by boards and greater leadership on climate change from financial policy-makers and regulators would help drive changes in the market faster. Also, educating and engaging the broader investment community and generating stakeholder debate and demand for sustainable investment products and services by institutional and retail investors.

Alignment: Arguably, the mandates, strategic priorities and performance metrics of public bodies and public finance institutions should be *aligned* with national climate change (and broader sustainability) goals and commitments, and there appear to be steps in that direction. A key question is how far the Government could, and should, go towards directing *private* investment in a similar way (i.e. beyond disclosure on consistency, as per the French regulatory model).

Ultimately, the best path to resilience is alignment of economic and financial systems with a low-carbon pathway. In theory, this will be achieved by markets integrating and pricing climate change related factors. In practice, there is a risk that this won't happen at the necessary pace and scale. Markets will be constrained by the pace and ambition of policy. Even with a high carbon price, there are other market barriers to internalisation and to implementing positive investment strategies, including data and methodological challenges, access to and commercial viability of low-carbon investment options, plus additional structural and behavioural barriers in the financial system. Disclosure is an important enabler of integration, but not a panacea.



Matching capital supply with capital needs/demand: There are multiple challenges here, which are outlined in Section 1. Integration and innovation were among key themes underpinning the practical solutions. Building a diverse pipeline of investable deals requires: business and technology innovation and investment 'readiness'; product innovation by the market; and innovative investment platforms, partnerships and pilots. It will require a much greater government appetite for blended finance approaches, and a general willingness to experiment.

Generally speaking, the commercial viability or attractiveness of climate-solutions investing should improve as markets integrate climate change factors into asset valuations and credit ratings and market prices start to correct. Adding a systems lens might influence the investment case in the future too. Long-term investors may choose to move ahead of the market, applying a strategic tilt or hedge.

Even then, the fundamentals might still not stack up at the individual asset level, or for investments of a particular type or scale in general. Targeted interventions to foster positive investment by commercial investors and overcome barriers are needed. The Government's GIF could play a positive role, although its effectiveness will depend on design and capitalisation being fit-for-purpose, and ensuring the right operational expertise. The Government could also look at re-tooling or better leveraging existing public funding and financial institutions. Other measures to address structural barriers, such as those identified above, are also needed.

RECOMMENDATIONS

Based on research undertaken and some of the key themes which emerged from discussion at the IGCC workshop, a set of recommendations for accelerating investment in climate solutions for New Zealand have been set out here. These are recommendations of IGCC, and should not be interpreted as being the expressed or direct views of workshop participants.

Policy makers and regulators

- **Sustainable finance strategy:** In consultation with the investment community and other stakeholders, develop a long-term vision, roadmap and action plan for a sustainable financial system in New Zealand, involving barrier and gap analysis. This should include climate change (both mitigation and adaptation) as a priority area.
- **Innovation system:** As part of a broader climate finance strategy, strengthen New Zealand's innovation system and make climate change a strategic priority for this, as well as for broader public investment and funding programmes.
- **Financial market regulation:** As part of a broader climate finance strategy, consider the role of financial market regulation and regulators in driving climate-compatible investment. Including the case for clarifying or amending legal duties and disclosure requirements for directors, investors, trustees, financial product providers and financial advisers, in relation to climate change. Consider the case for more directional market incentives or measures to accelerate alignment with New Zealand's climate goals and commitments.

Investors

- **Integration:** Take steps to integrate consideration of climate change-related risk and opportunity into investment governance, strategy, operations and reporting. Engage with stakeholders to understand their values and concerns.
- **Collaboration:** Participate in forums for practical peer exchange and learning, collaboration on methodologies and tools and policy advocacy.
- **Engagement:** Initiate collaborative investor engagement and voting campaigns with key New Zealand companies, such as the Climate Action 100+, or identify opportunities to apply exciting initiatives to the New Zealand market.

The market

- **Product development:** Respond to growing market interest and demand for low carbon, climate-resilient investment related products and tools.
- **Industry upskilling:** Integrate climate change into professional training and education – e.g. through the Institute of Directors, CFA Society, NZICA and university business schools, and programmes to promote sustainability experts as candidates for boards.

Cross-cutting

- **Climate finance innovation:** Establish a multi-stakeholder climate finance 'innovation lab'²⁴, modelled on (and potentially collaborating with) international examples.
- **Demand generation:** Pursue government and stakeholder campaigns to raise awareness, stimulate debate and generate demand around sustainable investment.

CONCLUSIONS & NEXT STEPS

There is currently a significant amount of policy work underway in New Zealand, aimed at setting a long term direction of travel, provide investment signals and design and deliver mechanisms for catalysing increased activity.

There is also increasing appetite and interest in the private sector for tackling both mitigation and adaptation risk challenges in New Zealand.

When IGCC convened investors, financial market intermediaries and other key stakeholders for a workshop in Auckland in October 2018, it became clear, there are also some common themes and major challenges which need to be addressed head-on to unlock the capital investment required to really transition New Zealand to a net zero emissions future.

For IGCC, we see further opportunities to engage further in areas such as:

- Working with other interested parties to convene an informal, voluntary network of New Zealand investor and financial market participants and stakeholders on climate finance challenges.
- Supporting the Sustainable Finance Forum.
- Providing investor input to Government on the development and deployment of the Green Investment Finance Fund.
- Looking at further research on investor and directors' duties as they relate to climate change obligations.

Hopefully the insights captured in this report, the summary themes and the key recommendations will provide a useful contribution to the national conversation currently underway in the New Zealand market. We would welcome further feedback.

IGCC will continue to engage with our members, with Government and the market to advance these issues and to develop the tools and resources investors need to develop investment solutions in New Zealand.

APPENDIX

Potential Barriers for Investing in Climate Solutions in New Zealand: As discussed at the IGCC Workshop, 8 October 2018, Auckland, New Zealand

Table A sets out commonly identified types of barriers to, and enablers of, climate-compatible investment by private investors.

Table B sets out specific issues, insights and challenges for the New Zealand market, based on local investor experience.

Table A

NZ MARKET GENERIC VS. CLIMATE CHANGE SPECIFIC	MIGRATION VS. ADAPTATION?	SECTOR OR LOCATION?
DOMESTIC VS. INTERNATIONAL INVESTMENTS?	PUBLIC VS. PRIVATE MARKET?	ASSET CLASS/ FINANCIAL INSTRUMENT?
TYPE OF INVESTOR - INSTITUTIONAL, RETAIL, OTHER?	STAGE OF COMMERCIALISATION?	CAPITAL SUPPLY OR DEMAND SIDE?

SOURCE: JUSTINE SEFTON 2018

Table B

INVESTORS	TYPES OF BARRIERS	CURRENT DEVELOPMENTS
MOTIVATION	BARRIERS: Constrained (real or preceived) by investment horizons, mandates, duties and beliefs; plus lack of awareness, understanding or integration of climate change-related investment risks and opportunities in NZ markets	GOVERNMENT: <ul style="list-style-type: none"> • Zero Carbon Bill • Climate Change Response Act amendment (NZ ETS) • Productivity Commission Report on Low-Emissions Transition • Green Investment Fund • Govt partnerships: e.g. Sustainable Wealth Initiative, Auckland Council, Fonterra • Other direct Government funding – e.g. Sustainable Farming Fund. One Billion Trees • Agriculture – iCCC options analysis
	ENABLERS: <ul style="list-style-type: none"> • Clarification/reinterpretation/reform of investor horizons, purpose and legal duties (public + private Fis) – directional market intervention by government? • Market leadership; evolution of market best practice; values alignment (stakeholders/society) • Education and integration into investment governance, strategy, operations and culture 	
CONFIDENCE	BARRIER: Future policy/transition pathway uncertainty; specific investment barriers; green asset bubble risk	
	ENABLERS: <ul style="list-style-type: none"> • Long-term, stable policy and institutional arrangements and transition plan; long term carbon price visibility • Comprehensive, coordinated national low-emissions investment strategy involving barrier and gap analysis • Specific interventions to address policy, regulatory, market, technology, information or other barrier/risks. 	
ACCESS & EXECUTION	BARRIER: Lack of a pipeline of investible projects/deals or suitable vehicles to access; capability and skills	MARKET <ul style="list-style-type: none"> • Invesor Group on Climate Change • Climate Leaders Coalition • Practical examples of climate-aligned investment
	ENABLERS: <ul style="list-style-type: none"> • Foster innovation ecosystem - from RD&D through to large-scale commercial deployment • Product development - thematic indices/funds and diversification of financial instruments • Innovative partnerships, platforms, market intermediaries; piloting and learning; peer exchange 	
COMMERCIAL VIABILITY OR ATTRACTIVENESS	BARRIER: Mismatch with investor risk appetite/risk-adjusted return requirements; compounded by (<2°C) misaligned benchmarks, and challenges of measuring and internalising climate related downside risk/upside potential into risk modelling and asset valuations	
	ENABLERS: <ul style="list-style-type: none"> • Robust carbon price; supplementary support for low-emissions innovation; blended finance/de-risking. • Adjustment of asset allocation and benchmarks. • Collaboration on approaches and tools for integration into risk modelling/asset valuations – incl. scenario analysis • Mandatory, harmonised climate-change related disclosure by firms. 	

SOURCE: JUSTINE SEFTON 2018

REFERENCES

- 1 Productivity Commission, Low-emissions economy Final report (August 2018) - <https://www.productivity.govt.nz/inquiry-content/3254?stage=4>.
- 2 Climate Change Adaptation Technical Working Group, Adapting to Climate Change in New Zealand - Adapting to Climate Change in New Zealand (May 2018) - <http://www.mfe.govt.nz/publications/climate-change/adapting-climate-change-new-zealand-recommendations-climate-change>.
- 3 See New Zealand Ministry for the Environment website for details - <https://mfe.govt.nz/climate-change>.
- 4 See RBNZ website - <https://rbnz.govt.nz/research-and-publications/speeches/2018/speech2018-07-12>; <https://rbnz.govt.nz/research-and-publications/speeches/2018/speech2018-09-07>.
- 5 <https://www.climateleaderscoalition.org.nz/>.
- 6 <https://www.theaotearoacircle.nz/forest>.
- 7 <https://igcc.org.au/joint-statement-calls-on-the-finance-sector-to-support-the-development-of-sustainable-finance-roadmaps-for-australia-and-new-zealand/>.
- 8 Noting the legal opinion on directors' duties and climate risk by Australian QC, Noel Hutley – <https://cpd.org.au/2016/10/directorsduties/> - and the view he has expressed that "it's only a matter of time".
- 9 Including a potentially precedent-setting legal claim against Australian super fund, REST, by one of its members (Mark McVeigh).
- 10 <http://www.mindfulmoney.nz/>, <https://bettersaver.co.nz/social-good>, <https://www.responsiblereturns.com.au/>.
- 11 <https://www.fsb-tcfd.org/>.
- 12 For details on the French Energy Transition Law - <http://www.unepfi.org/fileadmin/documents/PRI-FrenchEnergyTransitionLaw.pdf>.
- 13 This is reflective of where the New Zealand market is at generally with responsible investment/EGS. See RIAA, Responsible Investment Benchmark Report 2018 New Zealand - https://responsibleinvestment.org/wp-content/uploads/2018/08/RIAA_RI_Renchmark_Report_NZ_2018v7.pdf.
- 14 <https://www.kiwisaver.govt.nz/>.
- 15 See RBNZ website for details - <https://www.rbnz.govt.nz/>.
- 16 See RBNZ website for details - <https://www.rbnz.govt.nz/>.
- 17 The Zero Carbon Bill identifies three 'net zero target' options: (1) zero carbon dioxide - reducing net carbon dioxide emissions to zero by 2050; (2) net zero long-lived gases and stabilised short-lived gases; and (3) reduce emissions of long-lived gases to net zero by 2050, while also stabilising emissions of short-lived gases. Each target option has different implications for the climate and economy. Modelling suggests that, under any target, there will be need to be significant increases in new forest planting and emissions reductions in transport and energy, as well as changes in land use. (Source: Mfe, Our Climate Your Say: Consultation on the Zero Carbon Bill (June 2018) – <https://mfe.govt.nz/node/24262>.) Relevant research and recommendations were made in recent reports by the Productivity Commission and the Parliamentary Commissioner for the Environment.
- 18 <https://treasury.govt.nz/information-and-services/nz-economy/living-standards>.
- 19 Both issues are addressed in the Productivity Commission's Low-emissions Economy report. Required levels of methane reductions is addressed in recent research by the Parliamentary Commissioner for the Environment, A Note on New Zealand's Methane Emissions from Livestock (August 2018) - <https://www.pce.parliament.nz/publications/a-note-on-new-zealand-s-methane-emissions-from-livestock>.
- 20 <https://contact.co.nz/aboutus/sustainability/financial-sustainability>.
- 21 See website for details – <https://www.nzgbc.org.nz/>.
- 22 Economic and financial systems operate with social and environmental system constraints – both under pressure from climate change physical and transition impacts. Runaway climate change, or a delayed/poorly-managed response, may also impact on the stability of the global economy and financial system, potentially lowering business performance and investment returns overall. This includes potentially 'unhedgeable risk' from market sentiment shift causing sudden asset re-pricing.
- 23 See, for example, the study by the University of Cambridge Centre for Sustainability Leadership, Unhedgeable risk: How climate change sentiment impacts investment (November 2015) - <https://www.cisl.cam.ac.uk/resources/sustainable-finance-publications/unhedgeable-risk>.
- 24 For example, The Lab - <https://www.climatefinancelab.org/>.

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