

APRIL 2018

CLIMATE FINANCE
LANDSCAPE FOR
AOTEAROA NEW ZEALAND:
A PRELIMINARY SURVEY

MōHIO

DR. DAVID HALL
SAM LINDSAY

Acknowledgements

The authors would like to acknowledge Ian Short and Ed Montague for their strategic direction. The paper has also benefited from feedback from Adrian Wimmers, John McCarthy and Bill Kermode. The authors would also like to acknowledge The Policy Observatory, as well as the wider team within AUT's Faculty of Design and Creative Technologies, for support.

Disclaimer

This paper was prepared for the Ministry for the Environment in mid-2017. It is derived from literature reviews and interviews; however, *the views and opinions expressed in this article are those of the authors alone and do not necessarily reflect the official policy or position of any person or department within the New Zealand Government.* Due to the very broad scope of the topic and the limited time provided to undertake this analysis, there will inevitably be omissions – hence this is a preliminary survey intended to orient future research and analysis.

How to cite this document: David Hall and Sam Lindsay (2017), *Climate Finance Landscape for Aotearoa New Zealand: A Preliminary Survey*, Report Prepared for the Ministry for the Environment, Auckland: Mōhio.

MōHIO

Mōhio is a research collective that provides research and policy solutions to reflect the particular context of Aotearoa New Zealand: its circumstances, its values and its opportunities.

With support from:



Cover Photo Credit: Cassie Matias via Unsplash

Contents

Executive Summary	1
1. The Global Context	5
1.1 A Changing World	5
1.2 The Rise of Natural Capital	9
1.3 An Evolving Investment Spectrum	12
1.4 The Integration of Intended Outcomes	16
2. The New Zealand Context	20
2.1 International Commitments	20
2.2 Current Situation	21
2.3 Domestic Policy Opportunities	24
3. Introduction to Climate Finance	27
3.1 Defining Climate Finance	27
3.2 The Scale and Shortfall of Global Climate Finance	29
3.3 Challenges and Limitations	30
4. Climate Finance Instruments	32
4.1 Grants	32
4.1.1 New Zealand Examples	34
4.2 Balance Sheet Finance	36
4.2.1 New Zealand examples	36
4.3 Project Finance	37
4.4 Equity Instruments	37
4.4.1 New Zealand Examples	38
4.5 Debt Instruments	41
4.5.1 Market-rate Debt	41
4.5.1.1 New Zealand Examples	41
4.5.2 Low-cost Debt	42
4.5.2.1 New Zealand Examples	42
4.6 Bonds	43
4.6.1 Climate-aligned Bonds	45
4.6.2 Green Bonds	45
4.6.3 Climate Bonds	46
4.6.4 Impact Bonds	47
4.6.5 Green Bonds: New Zealand versus Australia	48
5. Recommendations	51
5.1 Disclosure and Reporting	52
5.2 Climate Finance Tracking	53
5.3 Climate-friendly Principles for Existing Institutions	54

5.4 Pipeline of Climate-aligned Projects.....	55
5.5 Structural Realignment to Climate Objectives	56
5.6 Climate Change Leadership.....	57
5.7 Alternative Organisational Forms	58
5.8 Project-oriented Intermediaries	59
5.9 Green Investment Fund	60
5.10 Carbon Pricing	61
6. New Zealand Instrument Examples	64
6.1 Low Emissions Accelerator Fund (LEAF)	64
6.2 Permanent Forest Bond (PFB).....	69
7. Postscript	75
7.1 Living Standards Framework.....	75
7.2 Green Bonds.....	75
7.3 Green Investment Fund	76
7.4 New Zealand Super Fund	77
8. Bibliography	78

Executive Summary

The transition by financial markets to a low-emissions global economy has already begun (see §1.1). Global capital is increasingly being channelled in directions that prioritise and enable climate-aligned projects to deliver mitigation and adaptation benefits. These capital flows are what we call *climate finance*; that is, investment and expenditure – public and private, domestic and transnational – that demonstrably contributes to climate mitigation, adaptation or both (see §3.1).

As a country that operates openly in the global economy, New Zealand faces immediate, medium- and long-term decisions about how to engage with this transition toward a low-emissions economy, in a way that maximises the advantages of our unique geographic, cultural and political circumstances. Although this transition will require new kinds of investment, this climate-aligned expenditure provides opportunities to create new jobs and industries, to spur growth in different parts of the economy, and to crowd-in new capital from diverse sources through emerging frameworks of impact investment (see §1.2–4).

At a global level, various analyses reveal a significant gap between the level of current global climate investment and the level of expenditure required. For example, it is estimated that current global climate finance flows are around US\$391–714 billion annually, yet it is also estimated that, over the next 15 years, investments of US\$900 billion annually will be required to meet the national pledges made in the 2015 Paris Agreement, or US\$1.13 trillion annually to limit global temperature increase to 2°C (see §3.2). There is growing pressure at all levels to address this global investment shortfall.

The Paris Agreement imposes a range of obligations and expectations upon signatory nations, including New Zealand (see §2.1). Alongside the national and collective commitments to reduce net greenhouse gas emissions, Article 2(1) of the Paris Agreement commits parties to: “Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate resilient development”. This goal encompasses *all* finance flows, transnational and domestic, and creates an expectation upon New Zealand to undertake activities that in the short- and medium-term will redirect climate finance flows toward low emissions and climate-resilient outcomes.

The primary focus of this report, however, is *domestic climate finance* – that is, finance flows that are internal to New Zealand by having domestic use-of-proceeds for climate-aligned projects and activities. (This contrasts with international climate finance, where investment flows from developed to developing countries to support sustainable, climate-aligned development.) This report shows that there are already a range of financial flows within New Zealand that meet climate finance definitions (see Section 4). Nevertheless, there are significant opportunities to increase the volume

and effectiveness of climate finance flows in order to better align with New Zealand's international obligations and expectations, not least the collective agreement to reach global net zero emissions by the second half of this century. Improving the quantity and quality of climate finance is not only a challenge for New Zealand but for all signatories to the Paris Agreement, due to the major global shortfall of adequate climate investment. However, creating a more enabling environment for climate finance flows will not only help New Zealand to meet its international obligations, it will also position New Zealand favourably within the global economy as the transition to lower emissions activities gathers pace.

This report further examines domestic climate finance through the lenses of *natural capital* and *impact investing*. These ideas can contribute to a more systemic approach to climate policy which recognises the rich value stack of social, environmental and economic benefits from climate-aligned projects; and also, the wide spectrum of actors – impact investors, institutional investors, venture philanthropists, corporate sustainability managers, bond issuers, and so on – that the New Zealand Government could coordinate with to promote effective, self-sustaining, climate-aligned investments. The potential here is captured by the motto: *blended finance for integrated impacts*. Finance is *blended* in the sense that public investments are used to catalyse private investments (or vice-versa); and *integrated* in the sense that finance is directed towards combined social, environmental and economic benefits.

From this perspective, New Zealand Government can play any combination of at least four roles: (1) *direct investor*, (2) *investment manager*, (3) *market maker* and (4) *trailblazer* (see §1.3). (These roles should be regarded as a complement to – and not a substitute for – other key roles that the New Zealand Government plays within climate policy more widely, which includes *regulator*, *protector* and *steward*.) As a *direct investor*, the New Zealand Government already provides multiple grants in areas like energy efficiency and sustainable land management (see Section 4). These grants constitute the majority of public finance flows and are useful for providing a first step in project trajectory or overcoming early-stage market failure. However, there is potential for the New Zealand Government to maximise the impact of its direct investments by giving greater priority to the other three roles. An *investment manager* role would emphasise the importance of financing pipelines for climate-aligned projects and companies to nurture innovation to maturity, to provide growth capital for ideas that work. A *market maker* role would recognise the New Zealand Government's capacity to support climate-aligned projects and companies by being first purchaser, or a large-scale purchaser, of climate-aligned goods and services. And a *trail blazer* role would recognise the New Zealand Government's capacity to lead the way globally, especially in those sectors where New Zealand has unique mitigation opportunities, such as land use and transport powered by renewable energy. To enhance New Zealand's climate finance system, this report identifies ten recommendations (see Section 5) – from low-hanging fruit to more elaborate interventions – that would create a more facilitative enabling environment for climate finance. These are:

Recommendations	Description
1: Disclosure and Reporting	More robust disclosure and reporting of climate-related financial risks and liabilities in the public and private sectors.
2: Climate Finance Tracking	Selective tracking of climate finance flows within New Zealand to identify baselines and opportunities.
3: Climate-friendly Principles for Existing Institutions	The adoption of climate-friendly investment principles by existing entities and organisations across the investment spectrum.
4: Pipeline of Climate-aligned Projects	Establish a pipeline of investable projects to enhance transparency and to support long-term investment planning.
5: Structural Realignment to Climate Objectives	Address structural and policy misalignments that incentivise high-emissions activities and that dilute or counteract enabling factors for climate finance.
6: Climate Change Leadership	Support climate leadership across government and non-governmental sectors, whether by administering or enabling climate-aligned activities, or through adaptive leadership.
7: Alternative Organisational Forms	Encourage alternative organisational forms, especially in the social enterprise sector, to encourage companies and entities that take an integrated approach to business activities.
8: Project-oriented Intermediaries	Support project-specific intermediaries that can facilitate finance flows between supply and demand for climate-aligned projects.
9: Green Investment Fund	Explore the potential of a green investment fund as a single national entity to advance multiple aspects of climate finance simultaneously, by functioning as an intermediary, knowledge repository, and champion of climate-friendly principles.
10: Carbon Pricing	Determine a consistent carbon price for policy planning that provides an adequate signal of climate-related risks for short- and long-term investment decisions.

Finally, this report sketches two hypothetical climate finance instruments that embody the principle of *blended finance for integrated impacts* (Section 6).

Firstly, the Low Emissions Accelerator Fund (LEAF) is an example of a hybrid equity instrument that provides strategic financing solutions to hurdles for green technology uptake, especially in energy efficiency and fuel switching. This fund is an example of prioritising an *investment manager* approach, where public funds are used to support climate-aligned companies through an equity stake, in order to overcome the limited access to capital frequently experienced by companies beyond the start-up stage but not yet fully mature. By de-risking climate-aligned investment for private investors, LEAF is designed to precipitate a “culture change” in the investment community, by creating opportunities for investors to become familiar with climate-aligned impact investment.

Secondly, the Permanent Forest Bond is a debt instrument issued by a non-sovereign intermediary that provides upfront capital for the establishment of permanent native forest. It is an example of an Integrated Impact Bond that delivers a rich climate-aligned value stack of environmental and social benefits by unlocking private capital through pay-for-performance contracts, backed by government’s commitment to pay for successful climate-aligned outcomes.

1. The Global Context

“It’s the biggest opportunity in the history of the world – it’s the biggest investment opportunity, but we have to have a clear vision, we have to have policy leadership... to bring the world community together to get the financing that is needed to move the momentum more quickly.”

—Al Gore, former U.S. Vice President and co-director of Generation Investment Management.

“Finance will be a key factor [in achieving a growth path that is resilient, inclusive and sustainable]: capital must be mobilised from both public and private sources, supported by a variety of financial instruments tuned for low-emission, climate-resilient infrastructure.”

—OECD (2017), *Investing in Climate, Investing in Growth*, p.15.

1.1 A Changing World

The transition by financial markets to a low-emissions global economy has already begun. Internationally, it is recognised that environmental disruption from climate change entails significant global economic loss, whether in terms of lost or depreciated assets, or lost labour productivity. But alongside the global economic risks of climate change, there is also a growing acknowledgement of the environmental, economic, and social benefits of climate action. Climate change should be grasped not merely as immediate expenditure, but as an opportunity to attract vast capital flows into low-emissions investments, to create jobs, and to spur economic growth.

Recent modelling by the OECD estimates that a collective “decisive transition” could boost long-run economic output among G20 countries by 2.8% on average. If avoided costs of climate-related damage are also included, then the net effect for 2050 rises to 4.7% higher than a business-as-usual scenario.¹

One notable example of future costs is the problem of “stranded” fossil fuel assets. It has been estimated that, to stay within 2°C warming, capex in fossil fuels worth US\$2.2 trillion would need to be forfeited.² In other words, 60–80% of all existing global fossil fuel investments will be written off as “stranded assets” as the fossil fuel market shrinks to fit a 2°C carbon budget.³ This would

¹ The transitions assumed here are integrated, synergistic reforms that include investment into “low-emission, climate-resilient infrastructure; an additional fiscal initiative to fund climate-consistent non-energy infrastructure; pro-growth reform policies to improve resource allocation; technology deployment; and green innovation”. OECD (2017), *Investing in Climate, Investing in Growth*, Paris: OECD, p.21.

² Carbon Tracker Initiative (2015), “The \$2 Trillion Stranded Assets Danger Zone: How Fossil Fuel Firms Risk Destroying Investor Returns”, London: Carbon Tracker Initiative.

³ Carbon Tracker Initiative (2013), “Unburnable Carbon 2013: Wasted Capital and Stranded Assets”, London: Carbon Tracker Initiative and Grantham Research Institute on Climate Change and the Environment.

entail significant secondary effects in the financial system due to large-scale divestment from fossil fuels.

These systemic risks were famously acknowledged by Bank of England Governor Mark Carney who, in a speech to Lloyd's of London in September 2015, warned that “a wholesale reassessment of prospects, especially if it were to occur suddenly, could potentially destabilise markets”. If investors wait to respond to events rather than shift their investments pre-emptively, he argued it “may already be too late”.⁴ As Chair of the Financial Stability Board (FSB), Carney since established the Task Force on Climate-Related Financial Disclosures (TCFD), chaired by Michael Bloomberg, which recently released its recommendations on climate-related disclosures for the financial sector (see §5.1).⁵

Coalitions of investors have made similar commitments. In September 2014, a global group of 409 institutional investors overseeing US\$24 trillion in assets signed a statement on climate change. The statement declares that investors “are acutely aware of the risks climate change presents to our investments. In addition, we recognise that significant capital will be needed to finance the transition to a low carbon economy and to enable society to adapt to the physical impacts of climate change.”⁶ Similarly, a coalition of asset owners, investment managers and individual funds worth US\$11.2 trillion signed The Paris Green Bonds Statement in December 2015 which committed to supporting the growth of green bonds and related instruments, as well associated government policy. The Statement was supported by the Investor Group on Climate Change in Australia and New Zealand.⁷

Shifts of capital into climate-aligned investments are already occurring. The diagram on the following page – from Climate Policy Initiative’s *Global Landscape of Climate Finance 2015* report – illustrates global climate finance flows from source to final use-of-proceeds via various intermediaries and financial instruments:

⁴ Pilita Clark (2015), “Mark Carney Warns Investors Face ‘Huge’ Climate Change Losses”, *Financial Times*, 29 September 2015.

⁵ Task Force on Climate-Related Financial Disclosures (2017), Recommendations of the Task Force on Climate-Related Financial Disclosures, report prepared for Mark Carney, Chairman of the Financial Stability Board.

⁶ Asia Investor Group on Climate Change, Investor Group on Climate Change, Institutional Investors Group on Climate Change, Investor Network on Climate Risk, United Nations’ Principles for Responsible Investment Initiative, & United Nations Environment Programme’s Finance Initiative (2016), “Global Investor Statement on Climate Change”.

⁷ See the Paris Green Bonds Statement (9th December 2015):

[https://www.climatebonds.net/files/files/Paris_Investor_Statement_9Dec15\(1\).pdf](https://www.climatebonds.net/files/files/Paris_Investor_Statement_9Dec15(1).pdf)

GLOBAL LANDSCAPE OF CLIMATE FINANCE 2015

Landscape of Climate Finance 2015 illustrates climate finance flows along their life cycle for the latest year available, mostly 2014, in USD billions

USD 391^{BN} TOTAL

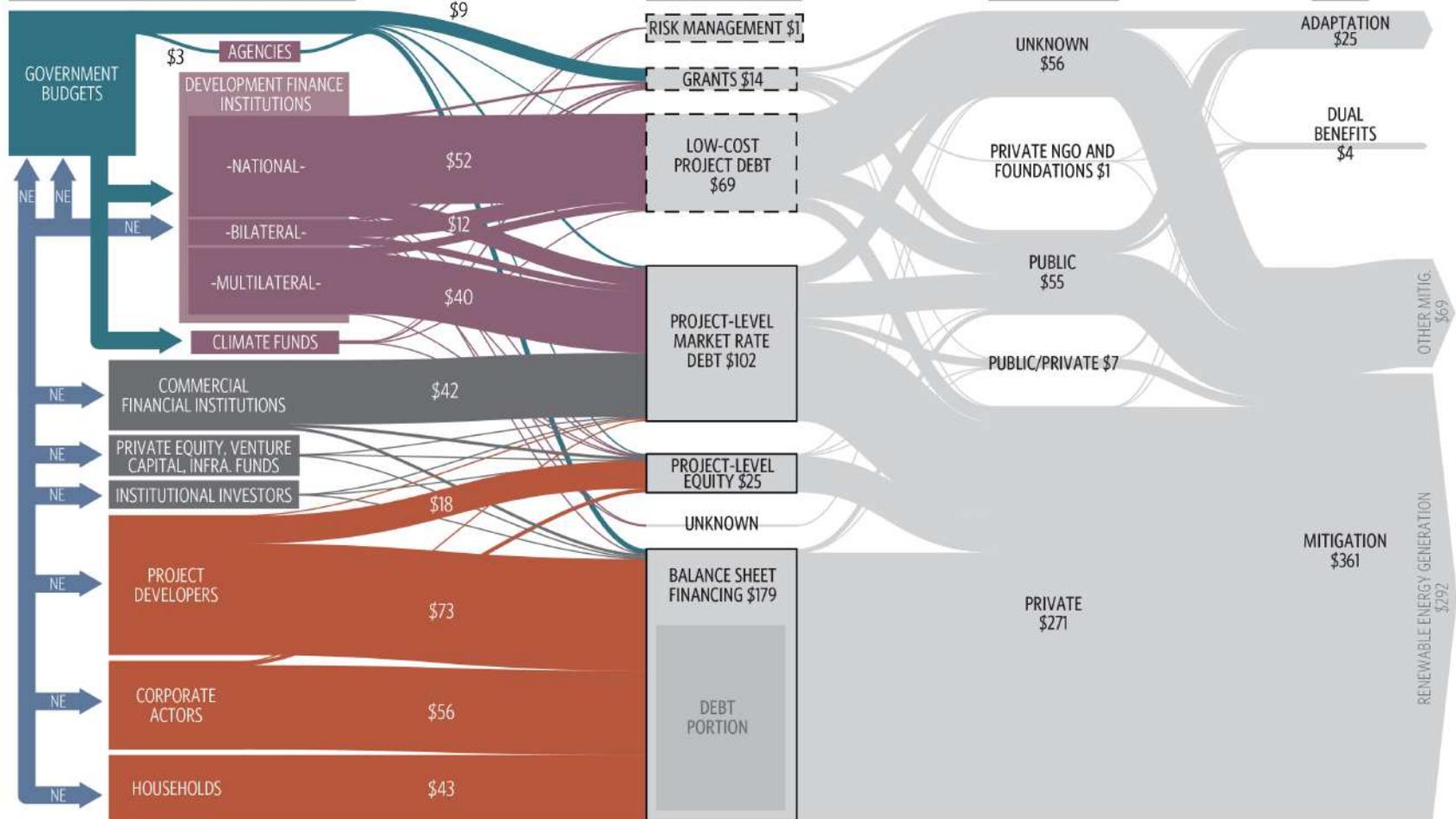


SOURCES AND INTERMEDIARIES

INSTRUMENTS

RECIPIENTS

USES



KEY

- PUBLIC MONEY
- PRIVATE MONEY
- PUBLIC FINANCIAL INTERMEDIARIES
- PRIVATE FINANCIAL INTERMEDIARIES
- CAPITAL INVESTMENT
- CAPITAL INVESTMENT AND INCREMENTAL COSTS
- FINANCE FOR INVESTORS & LENDERS
- NE: NOT ESTIMATED

The complexity of the diagram reflects the complexity of the climate finance system, but the important points are:

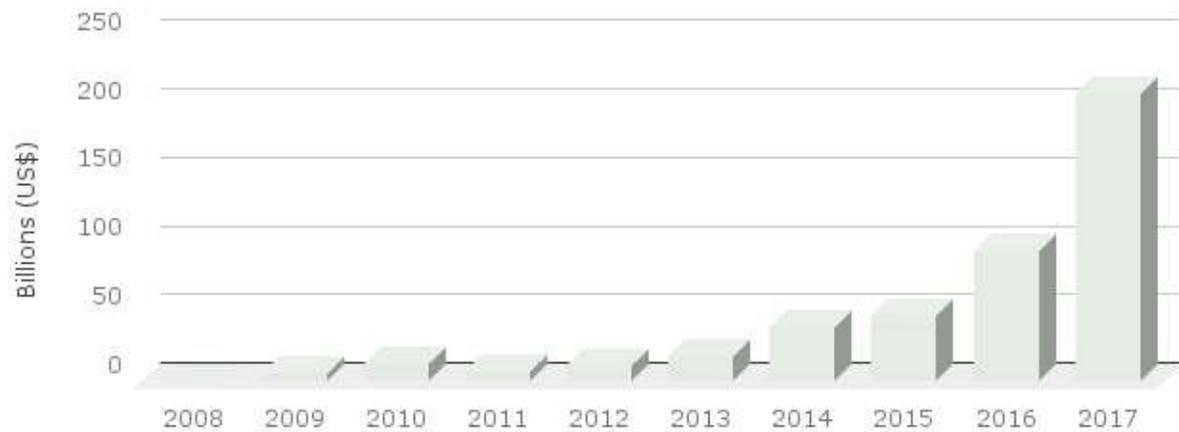
- global climate finance flows originate from a combination of public and private sources at a proportion of 38% and 62% respectively;
- climate finance is managed by a diverse range of private, public and hybrid actors, with a major role internationally played by development finance institutions;
- climate-aligned investment is operationalised through various financial instruments (see Section 4 for an in-depth discussion);
- About 69% of climate finance went to private sector recipients, which reflects a diversion of about 21% of all public climate finance into the private sector; and
- The vast majority of climate finance (93%) goes toward climate mitigation rather than adaptation.

Another sign of climate finance becoming established is the growth of the global green bond market. Green bond issuance began in 2007 but really took off in 2013 (see the graph below “The Green Bond Boom”). By 2016, labelled green bond issuance increased globally to US\$93.4 billion, a 120% increase on the previous year. Moody’s expects this issuance to increase by the same again in 2017, perhaps as high as US\$206 billion, driven by strong China-based issuances and renewed international commitment from the Paris Agreement.⁸

⁸ Moody's Investor Services (2017), “Announcement: Moody's: Global green bond issuance could rise to USD206B in 2017 after record in 2016, Global Credit Research”, 18th January 2017.

The Green Bond Boom

The market is expected to double in size again in 2017 according to Moody's.



Source: Data from Bloomberg New Energy Finance, 2017 projection from Moody's.

Green bonds solve a particular obstacle to climate-aligned investment by unlocking upfront capital for projects for which the returns for efficiencies and avoided costs occur over long timeframes. However, as discussed later in §4.6.5, while New Zealand's engagement with the green bond market is scant, Australia has become known as "an example of international best practice" in the issuance of green bonds.⁹

1.2 The Rise of Natural Capital

The idea of "natural capital" is one way that climate finance and green investment is becoming normalised globally. The natural capital approach invites governments, businesses and communities to think about climate finance through the eyes of a "savvy investor". Where is the smart investment? How can investments be most impactful? How can investors use financial capital to unlock *additional* capital, to make initial investments stretch even further?

Natural capital is already one of the four "capitals" at the heart of Treasury's Living Standards Framework. The others are *economic capital*, *human capital* and *social capital*. The Framework highlights how these capitals are impacted by, and impact upon, five factors associated with improved wellbeing: (1) economic growth, (2) sustainability for the future, (3) increasing equity, (4) social cohesion, and (5) managing risks. The ultimate goal of the Living Standards Framework is to

⁹ Sean Kidney (2017), "New CBA Climate Bond: AUD 650m: Australia bolsters international best practice status", Climate Bonds Initiative blog, 29th March 2017: <https://www.climatebonds.net/2017/04/new-cba-climate-bond-aud-650m-australia-bolsters-international-best-practice-status>

effectively manage the synergies and trade-offs between these five points and the four central capitals, in order to boost the value of the latter and thereby raise New Zealanders' living standards.



To focus only on natural capital, the key concepts are as follows:¹⁰

Natural capital refers to the stock of renewable and non-renewable natural resources on earth (e.g., plants, animals, air, water, soils, minerals) that combine to yield a flow of benefits or “services” to people. These flows include various ecosystem services which produce economic, social and environmental value that accrues to businesses, government, and society in general.

Ecosystem services are the benefits to people from ecosystems, such as timber, fibre, pollination, water regulation, climate regulation, recreation, mental health, and others. The classification approaches to ecosystem services are still evolving since the publication of the Millennium Ecosystem Assessment in 2005, but leading classifications today include the Common International Classification of Ecosystem Services (CICES) and the Final Ecosystem Goods and Services Classification System (FECS-CS).

Biodiversity is critical to the health and stability of natural capital as it provides resilience to shocks like floods and droughts, and it supports fundamental processes such as the carbon and water cycles as well as soil formation. Therefore, biodiversity is both a part of natural capital and also underpins ecosystem services.

All governments, businesses and communities impact and depend upon natural capital to some degree. Treasury's Living Standards Framework highlights how natural capital is impacted by, and impacts upon, the pursuit of economic growth, sustainability for the future, increasing equity, social cohesion, and managing risks. Each of these incur synergies and trade-offs with the four kinds of capital, including natural capital.

All governments, businesses and communities also experience risks and/or opportunities associated with those impacts and/or dependencies. These risks and opportunities can be valued, either by being priced or monetised, or expressed through other kinds of valuation. Natural capital valuations,

¹⁰ The definitions below are adapted from David Pearce and Giles Atkinson (1995), “Measuring sustainable development.” In: Bromley, Daniel, (ed.), *Handbook of Environmental Economics*. Cambridge, Mass., Blackwell Publishers, 166–81. AnnMari Jansson, Monica Hammer, Carl Folke, and Robert Costanza, eds. (1994). *Investing in Natural Capital: The Ecological Economics Approach to Sustainability*, Washington D.C.: International Society for Ecological Economics.

in turn, can be used for planning by governments, businesses and communities through intertemporal cost-benefit analysis, stakeholder engagement, or other kinds of decision making processes. The expectation of long-run costs from environmental degradation, or the opportunity costs from overexploiting non-renewable resources, can be used to justify present-day investments that will be economically optimal (discount rates notwithstanding). Natural capital analysis is one way to help identify when such investment is fiscally prudent, and what level of investment is warranted.

Analyses of the economic impacts of climate change generally anticipate large negative losses. For example:

- A 2015 Citigroup study analysed the costs of climate change in terms of cumulative lost GDP by the year 2060, estimating this loss to be US\$44 trillion globally, or 0.7%–2.5% of global GDP.¹¹
- A 2015 analysis by the OECD using its ENV-Linkages model, under a business-as-usual scenario, projected losses of global annual GDP of 1% to 3.3 %, with a central projection of 2%, by the year 2060. By 2100, global losses to GDP would rise to 2% to 10%. The largest negative consequences are anticipated to come from changes to crop yields and labour productivity.¹²
- A 2015 study of value at risk to the total global stock of manageable assets – as a consequence of climate change – ranged from US\$4.2 trillion to \$43 trillion between now and the end of the century.¹³
- A 2016 UNDP analysis estimated cumulative lost GDP by 2050 to be US\$33 trillion under a scenario where global warming is limited to 2.5°C increase, or a US\$21 trillion loss if climate policies are strengthened enough to hold mean global temperature increase to 1.5°C.¹⁴

In addition to New Zealand's own national costs, these global costs will impact upon New Zealand too. As Murray Sherwin, Chair of the Productivity Commission, notes: "Small, open economies

¹¹ This estimate is made on an undiscounted basis. See Jason Channell et al., "Energy Darwinism II: Why a Low Carbon Future Doesn't Have to Cost the Earth", Citi GPS: Global Perspectives & Solutions, August 2015, p.8.

¹² OECD (2016), "The Economic Consequences of Climate Change", ENV/EPOC(2015)12/FINAL, 23 March 2016.

¹³ The Economist Intelligence Unit (2015), "The Cost of Inaction: Recognising the Value at Risk from Climate Change," London; New York; Hong Kong; Geneva: The Economist Intelligence Unit Limited.

¹⁴ UNDP & Climate Analytics (2016), "Pursuing the 1.5°C Limit: Benefits and Opportunities", 2016 Low Carbon Monitor, (UNDP: New York).

inevitably are highly exposed to external developments.”¹⁵ A global slowdown as a consequence of climate change will affect New Zealand via diminished export markets. What is required is a more sophisticated approach to investment which considers future costs as well as immediate costs.

1.3 An Evolving Investment Spectrum

Increasingly, investors and investees are rejecting the notion that they face a binary choice between maximum risk-adjusted returns or donating philanthropically for social and/or environmental purposes. Consequently, there is a rapidly emerging investment spectrum which tailors to a more sophisticated range of investor preferences. While this newfound diversity of investment options is better serving the diverse preferences of investors, it remains challenging and complex to navigate this evolving investment space. Terms like “traditional”, “responsible”, “sustainable”, “thematic”, “ethical”, “ESG” (environmental/social/governance), “green” and “impact” are just a handful of the different terms and approaches used in this universe.

Roughly speaking, these terms each relate to an investment’s intentionality to create a positive social and/or environmental impact, in addition to a financial return, as a direct result of the investment. Figure 1 below shows one way to map these alternatives. As we move from left to right, the priority for maximised returns is increasingly subordinated to the priority for positive impact. Increasingly, “positive impact” is being conceived as aligned (or at least not misaligned) with reducing the risks associated with climate change.

¹⁵ Murray Sherwin (2012), “Managing for Success: Small Economies in a Dangerous World”, 22nd February, 2012: www.productivity.govt.nz/news/managing-for-success-small-economies-in-a-dangerous-world

ESG Risk Management					
Sustainable Investment Opportunities					
Deeper Impact Opportunities					
TRADITIONAL	RESPONSIBLE	SUSTAINABLE	THEMATIC	IMPACT	VENTURE PHILANTHROPY
Little or no focus on non-financial factors of underlying investment decisions. Investments could include tobacco, pornography, fracking, for example.	Investments are excluded based on ESG risk. Screened investments could include landmines, weapons, nuclear energy, fossil fuels, for example.	Focus on positive environmental and social outcomes, through investment selection, portfolio management and investment committee engagement. Carbon footprint, resource use, waste production, for example.	Centres on one or a cluster of issue areas where social or environmental need creates a commercial growth opportunity. Investments could include large scale affordable housing, for example.	Investments intended to create a positive social and/or environmental impact beyond financial return. Expanding access to important services, such as clean electricity, for example.	Financial returns are disregarded in favour for social and/or environmental impact.

Figure 1: Investment spectrum of impact

It is worth noting that, in spite of this differentiation, some of the obstacles faced by responsible, sustainable and impact investing are similar to those faced by traditional investing. In the New Zealand context, a critical obstacle is the “growth gap”: the shortage of capital for early-stage companies to undertake market development and expansion. Public and private grants, angel investors and crowd funding can provide a necessary “first step” by bridging the financing gap for initiatives that are too early stage to attract investment capital, or where there exists a market failure (see New Zealand examples in Section 4). But there remains a lack of expertise and provision of follow-on capital or a consistent investment strategy to help organisations build capacity over longer timeframes to become financially sustainable. This is a hurdle for all new companies, but especially those climate-aligned companies who focus on innovations and disruptive technologies which could deliver mitigation and adaptation outcomes.

Venture philanthropy is a potential solution to these obstacles. It seeks to use the tools of venture capital funding to promote start-up, growth and risk-taking in social ventures.¹⁶ In the words of the European Venture Philanthropy Association: “Venture philanthropy... is about matching the soul of philanthropy with the spirit of investment, resulting in a high-engagement and long-term approach to creating social impact.”¹⁷ Grant funding that takes a venture philanthropy approach can be a helpful mechanism to help drive social innovation. This is because grantors can handle a higher degree of risk that the project will not succeed, as financial returns are disregarded in favour of

¹⁶ Paul Brest and Kelly Born (2013), “When Can Impact Investing Create Real Impact?”, Stanford Social Innovation Review, Fall 2013. Retrieved from https://ssir.org/up_for_debate/article/impact_investing. Toniic Institute (2016), “Venture Philanthropists and Impact Investors”. Retrieved from <http://www.toniic.com/venture-philanthropists-and-impact-investors/>

¹⁷ European Venture Philanthropy Association website: <http://evpa.eu.com/about-us/what-is-venture-philanthropy>

social and/or environmental solutions. Insofar as governments play a role as catalyst, the focus should be what subsidisation levels are required to “bridge” the gap between grant funding and the point where the company can independently attract investment capital based upon its economic merits. Government should undertake to lessen these subsidies over the company’s lifespan, thereby requiring a greater volume of market-originated investments, each with lower transaction costs and more efficient pricing mechanisms. Recent OECD analysis suggests that “public funds should only be utilised where a tangible or imminent market failure in the private sector is evident”¹⁸ – but this will typically be the case for climate-aligned projects as long as long-term costs of climate change are externalised.

Hence the emphasis on *blended finance* – that is, strategic alignments of investment from public and private sources – which can occur through a range of instruments such as guarantees, credit enhancements, currency hedging, diversified insurance offerings, green bonds and securitised loans. As the OECD notes, these blended offerings – with a focus on “crowding in” private finance – can “help to mitigate and better allocate risk across different actors... and mobilise private investment in infrastructure, while optimising public investment.”¹⁹

What is the role of government?

Government is widely regarded to play vital roles in investment markets. As a 2015 OECD report remarks: “Government intervention can play a catalytic role in both facilitating the functioning of the [entrepreneurial and finance] ecosystem and targeting actions to trigger its further development.”²⁰ This is reinforced by a recent survey of social finance which found that: “Government is acknowledged as an important actor in economic market development.”²¹

The G8 Social Impact Investment Taskforce described government’s engagement in terms of three broad roles: as a *market participant* that makes investment choices, as a *market builder* that grows existing markets, and as a *market steward* that ensures appropriate regulation, removes barriers to action, and creates the conditions for replication and upscaling.²²

¹⁸ K. E. Wilson (2015), “Policy Lessons from Financing Innovative Firms”, OECD Science, Technology and Industry Policy Papers, No. 24, OECD Publishing, Paris, p.14.

¹⁹ OECD (2017), *Investing in Climate, Investing in Growth*, pp.34–35

²⁰ K. E. Wilson (2015), “Policy Lessons from Financing Innovative Firms”, p.12.

²¹ Rosemary Addis (2015), “The Roles of Government and Policy in Social Finance”. In Alex Nicholls, Rob Paton, and Jed Emerson (eds.), *Social Finance*, Oxford: Oxford University Press.

²² Social Impact Investment Taskforce (2014), “Impact Investment: The Invisible Heart of Markets”, Report of the Social Impact Investment Taskforce established under the UK’s G8 Presidency, 15 September 2014.

Narrowing down on government's role as *market participant*, there are four roles for impactful climate finance:²³

- **Direct investor:** Government can invest directly into climate-aligned activities through the provision of grants, debt, equity, bond issuance, and so on.
- **Investment manager:** Government can treat assets and activities within its jurisdiction as a “portfolio” that it manages to produce climate-aligned outcomes.
- **Market maker:** Government can create new markets, or accelerate emerging markets, by assuming the role of first buyer or large-scale purchaser of goods or services.
- **Trail blazer:** Government can pioneer novel or unprecedented projects which would otherwise be neglected under existing market conditions.

A local example of venture philanthropy is Foundation North's NZ\$5 million Gulf Innovation Fund Together (G.I.F.T) which is designed to encourage breakthrough insights, innovations and solutions to the complex environmental issues facing the Hauraki Gulf. Through a pipeline of sequential grants, G.I.F.T aims to support innovation from early-stage project development, through to prototyping, through to the scaling up of successful prototypes.²⁴ On 2nd May 2015, G.I.F.T funded a feasibility study to create for-profit impact investment products which aim to achieve a high-value, low-impact Hauraki Gulf fishery.

Impact investment provides more sustained opportunities for equity that could set climate-aligned companies on upward growth paths toward greater positive impact. Once a company or project has been “de-risked” to a satisfactory level beyond the start-up phase, then it becomes a contender for attracting impact investment. In a pioneering 2010 paper, “Impact Investments: An Emerging Asset Class”, by J. P. Morgan, Rockefeller Foundation and Global Impact Investing Network (GIIN) defines impact investment as “Investments intended to create positive impact beyond financial return”.²⁵ This definition breaks down into the following elements:

- **Investments:** The provision of investment capital exclusively (in contrast to philanthropic grants or donations).

²³ The authors thank Ed Montague for these distinctions (30th July 2017).

²⁴ Gulf Innovation Fund Together (G.I.F.T) website: <http://www.giftofthegulf.org.nz/>

²⁵ J. P. Morgan, Rockefeller Foundation and Global Impact Investing Network (2010), “Impact Investments: An Emerging Asset Class”, 29th November 2010.

- **Intended:** Investments are made into for-profit businesses with the intent to create a positive impact. This differentiates impact investments from investments that create negative impact, that are merely screened for negative impacts (like responsible investment), or that have unintentional positive social or environmental consequences.
- **Positive Impact:** Investments specifically generating positive social and/or environmental impact. The impact is a stated purpose of the business and measured when assessing the success of the investment.
- **Financial Return:** Investments are made with an expectation of financial return of, at least, the nominal principal. However, these returns could be market-rate or market-exceeding. Donations and grants are, therefore, not defined as impact investments.

If positive impact is aligned with climate mitigation and adaptation, then impact investing could assist in New Zealand's transition to a low emissions economy. However, this must be considered holistically, in terms of the wider investment environment. For instance, the New Zealand investment community is increasingly regarding investments in fossil fuels as no longer "responsible", either ethically or in terms of risk, and therefore divesting from fossil fuels in their investment portfolios. Two prominent examples are Auckland Council's April 2017 decision to withdraw all investments from companies that produce and extract coal, oil and gas; and NZ Super Fund's ongoing transition away from companies with high exposure to climate emissions and reserves.²⁶ But the flipside of divestment from high-emissions activities is the low-emissions activities that this capital must be redirected and reinvested into. New Zealand requires a pipeline of de-risked, low-emissions, investable products that capital can transition into.

1.4 The Integration of Intended Outcomes

Integrated investment and integrated reporting acknowledges that the distinction between social and environmental spheres is not clear cut, and that social/environmental outcomes and processes are substantially interwoven. Accordingly, there is an emerging investment spirit that recognises these systemic interrelationships, that exploits synergies and recognises co-benefits, and that seeks to manage trade-offs and incidental consequences. Below are two examples of projects that provide integrated outcomes by combing social and environmental goods.

²⁶ Anonymous (2017), "Auckland Council to pull investments from coal, oil and gas companies", *New Zealand Herald*, 12 April 2017. NZ Super Fund (2017), "NZ Super Fund Shifts Passive Equities to Low-Carbon", Media Release, 15th August 2017. Retrieved from <https://www.nzsuperfund.co.nz/news-media/nz-super-fund-shifts-passive-equities-low-carbon>

Sun-eee: Electrifying Rural Cambodia

Sun-eee is an impact enterprise focused on providing affordable electricity to rural Cambodia, using biomass and solar energy. Although Sun-eee's business model is not directly applicable to New Zealand, given these nations' different levels of development, the model does capture the essence of integrated social and environmental investment.

The company's objective is to double electrification rates in Cambodia, which has the region's lowest rural electrification rate and one of the highest tariffs. As a result, clean energy is economically viable there without subsidies. The firm's model focuses on acquiring existing Independent Power Producers (IPPs) which operate on diesel and making them clean, affordable, and sustainable by linking them to biomass and solar generation sources.

The investment's primary motivation is to help enable Sun-eee to provide clean energy to thousands of the rural poor in Cambodia. This has obvious environmental benefits, because Sun-eee converts diesel generators into biomass or solar generators, thereby forestalling further emission of CO₂ into the atmosphere. In addition to the immediate environmental benefits, there are also tangible downstream social benefits to each rural household as a result of gaining access to affordable electricity. For example, in Cambodia, approximately 61% percent of an estimated 2,400 child deaths are due to acute lower respiratory infections, attributable to household air pollution.²⁷ Over 90% of energy used for cooking comes from wood and charcoal.²⁸ A transition from the inefficient use of solid fuels (like wood and charcoal) and liquid fuels (like kerosene), towards cleaner energy sources can save lives by reducing indoor levels of black carbon and other fine particulate matter.

The financial instrument issued by Sun-eee was a *convertible note*, which was bought by impact investors to fund Sun-eee's series of IPP acquisitions. Instruments like a convertible note are an example of hybrid finance to achieve impact. A convertible note is a debt instrument that converts to equity at a predetermined time or event. It can be helpful in early-stage financing when the investee company's business model is too new to determine valuation. By utilising a convertible note, the investee company can defer the valuation negotiation to a later date when the business model may be better proven. Both the company and investor therefore have more information to properly determine a fair valuation.

²⁷ World Health Organization (2016), "Climate and Health Country Profile - 2015", Geneva: WHO.

²⁸ International Bank for Reconstruction and Development (2009), "Improved Energy Technologies for Rural Cambodia", New York: The World Bank.

Good to Grow: Department of Corrections and Department of Conservation

In November 2015, the Department of Corrections and the Department of Conservation entered a partnership to pursue integrated social and environmental outcomes. The agreement will provide for the increased delivery of work opportunities on Conservation sites for offenders on community-based sentences, especially undertaking habitat restoration work.

The Department of Corrections' motivation for involvement is that rehabilitation and reintegration outcomes for offenders will improve as they contribute to the conservation of interests of their community, learn new skills, and earn NCEA credits which will better equip the offenders in future employment opportunities. The agreement is another step towards achieving the Government's goal of reducing reoffending by 25 per cent by 2017.

The Department of Conservation's interest is for offenders to help maintain DOC sites, and tracks. It is also looking to cultivate a range of native plants in prison nurseries at Christchurch, Rimutaka, Whanganui and Auckland prisons.

The benefits of leveraging the intentionality behind such initiatives such as the Good to Grow partnership are worth highlighting here. For example, any mass afforestation initiative in New Zealand will require a large number of trees to realise this land use conversion. Current capacity is well below the level needed to effectively plant over one-million hectares of erosion-prone land in New Zealand.²⁹ By incorporating social outcomes – in this example, the reduction of recidivism rates – into an environmental investment decision, the New Zealand Government can potentially build a stronger case for action by looking at systems benefits that may accrue domestically as a co-benefit of that investment.

These one-off examples of integrated outcomes ought to be supported by an environment that values and incentivises these positive impacts. Much work has been done internationally³⁰ and nationally³¹ to enrich the measurement and evaluation of social progress beyond purely economic metrics. Basically, this involves recognising the interrelationships between financial, social and natural capitals that support human well-being and that raise living standards. Aligning climate policy with these wider outcomes is important for ensuring the widest possible constituency for support. The challenge for governments is to anticipate the likely effects that investment decisions in one

²⁹ Taupo Native Plant nursery, for example, is New Zealand's largest native plant producer and grows approximately 200,000 plants per year for both private and public projects.

³⁰ A prominent example is the United Nations' Sustainable Development Goals. See also Joseph Stiglitz, Amartya Sen and Jean-Paul Fitoussi (2009), *Report by the Commission on the Measurement of Economic and Social Progress*, Paris: Government of France; Tim Jackson (2009/2017), *Prosperity Without Growth: The Transition to a Sustainable Economy*, report prepared for the Sustainable Development Commission, London: Routledge; Kate Raworth (2017), *Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist*, White River Junction, VT: Chelsea Green Publishing.

³¹ See the New Zealand Treasury's Higher Living Standards, discussed in §1.2; and Mason Durie (2006), "Measuring Māori wellbeing." New Zealand Treasury guest lecture series. Wellington, New Zealand: Treasury; Caroline Saunders and Paul Dalziel (2014), *Wellbeing Economics: Future Directions for New Zealand*, Wellington: BWB Texts.

dimension of capital will have for other dimensions of capital. An excessive pursuit of financial capital, for example, can have deleterious implications for social and natural capital – and vice-versa.

What is required is a systemic approach that recognises the inter-relationships between these kinds of capital, that seeks synergies where capital growth is aligned, or that acknowledges the necessity for trade-offs and mitigates or remedies any negative consequences. This is likely to involve coordination – and, at times, collaboration – between public and private investment. Hence the general principle derived from the preceding discussion: *blended finance for integrated impacts*. Through strategic public, private and blended investment, New Zealand can reorientate its investment system toward producing tangible impacts that combine the reduction of climate-related risks with increased wellbeing for New Zealanders.

2. The New Zealand Context

2.1 International Commitments

On 4 October 2016, New Zealand ratified the Paris Agreement. Article 2(1) of the Paris Agreement aims to strengthen the global response to climate change by:

- **Mitigation:** Holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 °C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change;
- **Adaptation and low emissions development:** Increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production;
- **Finance:** Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.

As a party to the Paris Agreement, New Zealand faces various obligations and expectations. These obligations and expectations are summarised in MfE's National Interest Analysis:³²

- **Obligations:** where Parties are legally required to, or in the words of the Agreement 'Parties shall...' do or not do something.
- **Expectations:** where Parties are encouraged to do something. Although these expectations are not legally binding, they represent strong political pressure to act.

In regard to mitigation, the Paris Agreement imposes an *obligation* upon all Parties to communicate their "Nationally Determined Contribution" (NDC) to the United Nations, and to pursue domestic measures aimed at achieving them. New Zealand's NDC is to reduce greenhouse gas emissions by 30 per cent below 2005 levels by 2030. This target is equivalent to 11 per cent below 1990 levels by 2030. Although achieving the target is not in itself legally binding, "there is a very firm political commitment to do so".³³

³² Ministry for the Environment (2016), *National Interest Analysis: The Paris Agreement*, Wellington, NZ: New Zealand Government, pp.10-17.

³³ Ministry for the Environment (2016), *National Interest Analysis*, p.12.

There is also an *expectation* on New Zealand to support the collective undertaking “to reach global peaking of greenhouse gas emissions as soon as possible” and “to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century” (Article 4).

A primary focus of this report, however, is the Paris Agreement’s obligations and expectations in regard to *climate finance*. As noted above, Article 2(1)(c) specifies that New Zealand must make “finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.” This goal encompasses all finance flows and creates an expectation under the Paris Agreement upon New Zealand to undertake activities that in the short- and medium-term will redirect climate finance flows within New Zealand toward low emissions and climate-resilient outcomes.

A further set of obligations and expectations relate to transnational finance flows, especially in the context of wider objectives for climate finance to promote sustainable development and the elimination of global poverty. Article 9(1) imposes an *obligation* upon developed countries, including New Zealand, to provide financial resources to assist developing countries’ mitigation and adaptation efforts. Article 9(4) requires developed countries to “scale up” the provision of such financial resources compared to current efforts. Other aspects of Article 9 stipulate further *expectations*.³⁴ However the focus of this report is *domestic* climate finance flows, not international flows, so these will not be explored in further detail.

2.2 Current Situation

New Zealand’s Second Biennial Report under the UNFCCC projects that gross and net emissions are projected to rise in the period up until 2030. This is shown in Figure 2 below. The rise and fall in net emissions reflects expected felling of commercial forests as they reach maturity. These projections anticipate that New Zealand will overshoot its 2030 target of 30% below 2005 levels by a significant degree, although the volume of this overshoot cannot be specified because it depends on what accounting methodology will be used.

³⁴ These *expectations* include that New Zealand to make efforts to mobilise finance from a wide variety of sources (including the private sector) to support developing country mitigation and adaptation action; achieve a balance between adaptation and mitigation, taking into account country-driven strategies, and the priorities and needs of developing countries; demonstrate that New Zealand is contributing appropriately to the collective effort of mobilizing US\$100 billion per year by 2020 through to 2025; and provide not only bilateral development assistance, but also support for the UN Convention on Climate Change’s existing financial mechanisms such as the Green Climate Fund and Global Environment Facility (GEF).

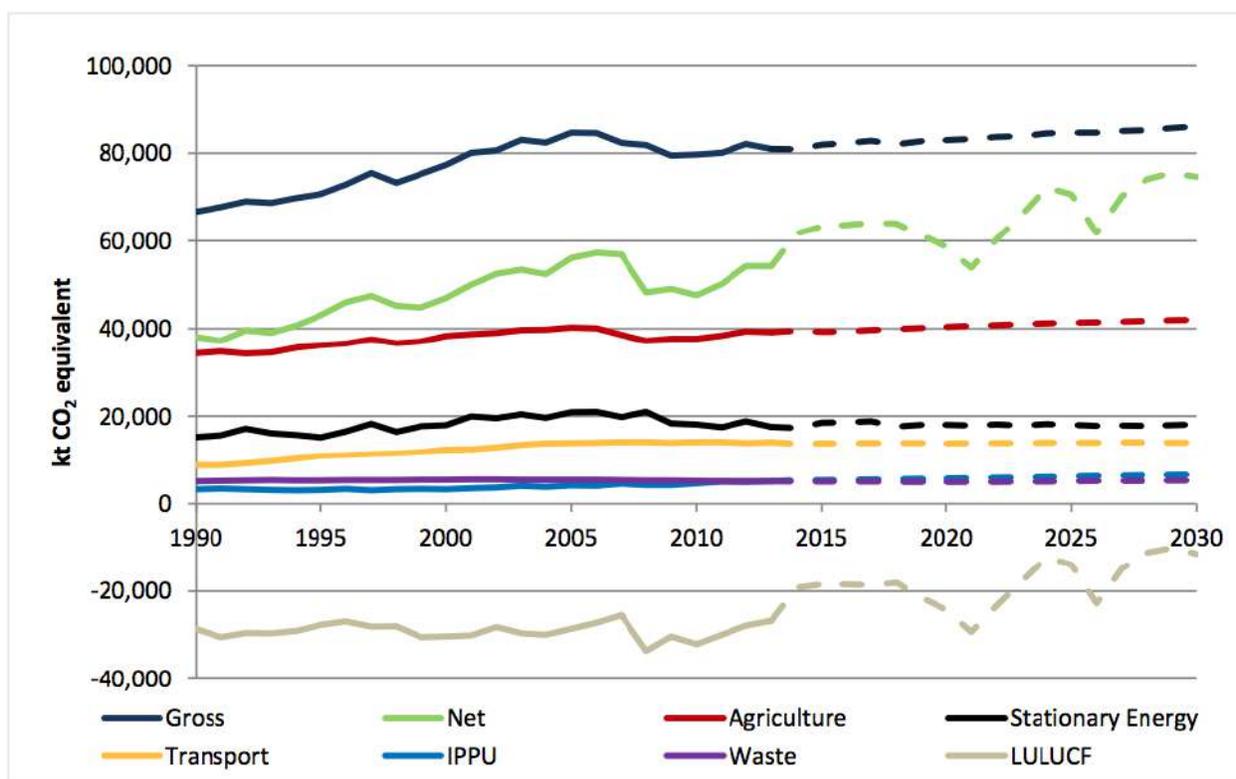


Figure 2: New Zealand's actual and projected emissions 1990–2030 under the UNFCCC.
(Source: MfE Second Biennial report, 2015).

The New Zealand Government oversees various domestic policies and activities which are relevant to climate mitigation and adaptation. These are identified in MfE's National Interest Analysis for the Paris Agreement as follows:

- “[the provision of New Zealand Units through the Emissions Trading Scheme and Permanent Forest Sink Initiative];
- the Electric Vehicles Programme [which includes a target of doubling EVs annually, regulatory changes, and NZ\$6 million annual for contestable funding for EV uptake projects];
- funding research, for example through the Crown Research Institutes for climate-related research;
- providing grants to help plant new forests [such as the Afforestation Grant Scheme and Erosion Control Funding Programme];

- other government policies with emissions-reduction benefits including energy efficiency policies, funding public transport and urban cycle ways, funding use of clean wood energy, collection of emissions from landfills, and the Waste Minimisation Fund;
- climate-related support provided through the Ministry of Foreign Affairs and Trade and delivered as part of the New Zealand aid programme, and the Ministry for the Environment's Climate Change Development Fund;³⁵
- local government policies with emission-reduction or climate resiliency benefits including Resource Management Act 1991 requirements, climate change strategies and plans for mitigating and adapting to the effects of climate change.”

Section 4 discusses some of these initiatives in further detail as examples of climate finance instruments. It warrants mentioning that the Emissions Trading Scheme (ETS) is not discussed in this report, because it is part of the regulatory environment, not a specific climate finance flow. The ETS's primary significance is its creation of a carbon price signal. At the time of writing, New Zealand Units (NZUs) are in the region of NZ\$16–18 per unit, although the overall carbon price is influenced by other climate-related factors, such as the influence of fossil fuel subsidies and land value (see more on carbon price in §5.10).

It also bears mentioning that domestic climate finance in New Zealand faces various particular hurdles. The relatively small size of the New Zealand market creates challenges for implementing solutions that require scale, such as bonds to provide debt to low-carbon projects. New Zealand's unusually high proportion of renewable energy reduces the eligibility for many potential energy efficiency and fuel switching projects as climate finance projects, because electricity in New Zealand already largely derives from low-emissions sources. This high level of renewable energy also reduces the potential for a carbon price to function effectively as an economic (dis)incentive. There also appear to be poorly understood cultural factors which appear to hinder the uptake of grants and other kinds of financing for climate-aligned objectives.

New Zealand also faces more general hurdles faced by other nations, recently summarised by a G20 report as follows: “Most countries lack the necessary policy and institutional foundations, including

³⁵ This includes NZ\$200 million in climate-related in support for four years, mostly bilateral development assistance for the Pacific region; NZ\$300,000 per year via the Ministry for the Environment's Climate Change Development Fund to assist developing countries deal with climate change challenges; NZ\$7.4 million to the Global Environment Facility (GEF) for its current four year replenishment round; an initial contribution of NZ\$3 million to the Green Climate Fund; and NZ\$45 million out to June 2016 to support the Global Research Alliance on Agricultural Greenhouse Gases (GRA) which was partly delivered as part of New Zealand's commitment to the UNFCCC's Fast Start Finance programme. A further NZ\$20 million contribution was announced at COP21. See Ministry for the Environment (2016), National Interest Analysis: The Paris Agreement, Wellington, NZ: New Zealand Government, p.15.

(i) long-term planning capacity (at the national, local and municipal levels) with a focus on sustainability from the outset; (ii) the ability to transform plans into bankable and sustainable projects that internalize positive and negative externalities over the life of the infrastructure; (iii) an enabling environment to attract the private sector including effective Public Private Partnership (PPP) frameworks; (iv) institutional arrangements to underwrite policy and funding risks; (v) overcoming the bias towards incumbent and less sustainable solutions; and (vi) the capacity to plan, build and commission projects efficiently.”³⁶

2.3 Domestic Policy Opportunities

The New Zealand Government plans to meet its 2030 emissions reduction target by a three-pronged approach: “(1) reducing greenhouse gas emissions in New Zealand; (2) growing more trees to absorb emissions; and (3) buying emissions reductions from overseas carbon markets.”³⁷ Economic modelling commissioned by the New Zealand Government has estimated that the economic cost of meeting New Zealand’s 2030 target – specifically, its reduction of Real Gross National Disposable Income – ranges from NZ\$1.4 billion to NZ\$3.6 billion annually throughout the 2020s. This assumes the availability of international carbon markets and a carbon price starting at \$25 in 2021 and rising to \$50 by 2030.³⁸ These models capture “both the direct cost and the flow-on economic effects of domestic reductions and international purchasing” and do not assume inclusion of the agricultural sector, nor any technological developments beyond business-as-usual in any sector, nor do they include forestry emissions and removals.³⁹

The focus of this report is how domestic climate finance can support the first two prongs – domestic emission reductions and the removal of atmospheric carbon dioxide by forests – as well as well as investments into adaptation for climate change.

In regard to (1) domestic emission reductions, the 2017 report *Net Zero in New Zealand* by Vivid Economics highlighted a range of opportunities for “emission reductions that are either competitive

³⁶ Celine Bak, Amar Bhattacharya, Ottmar Edenhofer and Brigitte Knopf (2017), “Toward a comprehensive approach to climate policy, sustainable infrastructure, and finance”, G20 Insights: Co-Chair Brief, Climate Policy and Finance Taskforce, p. 3.

³⁷ Office of the Minister for Climate Change Issues (2016), “Paris Agreement on climate change – ratification and domestic action”, Cabinet Paper prepared for the Cabinet Economic Growth and Infrastructure Committee, Wellington: New Zealand Government.

³⁸ Ministry for the Environment (2016), National Interest Analysis: The Paris Agreement, Wellington, NZ: New Zealand Government, p.31.

³⁹ See Appendix 3 in Office of the Minister for Climate Change Issues (2016), “New Zealand’s intended contribution to the new global climate change agreement.” Cabinet Paper prepared for the Cabinet Economic Growth and Infrastructure Committee, Wellington: New Zealand Government.

with, or almost competitive with, more emissions-intensive alternatives.”⁴⁰ This scenario analysis was commissioned and endorsed by GLOBE-NZ, a cross-party group of 35 members of the New Zealand Parliament. The report highlighted a growing suite of “‘deep decarbonisation’ opportunities, include energy efficiency, further decarbonisation of electricity generation, and the electrification of the transport fleet and of low-grade heat.” It also highlighted “similar opportunities in the agriculture sector including improving low-performing farms, breeding lower-emissions livestock and taking advantage of new feeds.”⁴¹

In regard to (2) the removal of carbon dioxide by forests, in October 2016 the Minister for Climate Change Paula Bennett noted that: “If forestry is cheaper than purchasing international units, and we think it might be, there is a strong economic case for planting more trees. [...] This could reduce the number of units we’ll need to purchase internationally.”⁴² The potential for afforestation and reforestation to contribute to net reductions in national emissions has been reinforced by a range of other analyses.⁴³

Pursuing these policy strategies creates opportunities to avoid a variety of long-term costs, lost value, and opportunity costs that follow from not meeting the 2030 target. These include:

- The continued costs of purchasing international emissions reductions through an international carbon market, ETS linkages, or through bilateral arrangements.
- The costs of damage to private and public assets caused by climate-related events – such as sea level rise and increased frequency and severity of flooding, wildfires, and drought⁴⁴ – that could have been avoided through investment into adaptation and climate resilience.

⁴⁰ Vivid Economics (2017), “Net Zero in New Zealand: Scenarios to Achieve Domestic Emissions Neutrality in the Second Half of the Century: Summary Report”, Report prepared for GLOBE-NZ, March 2017.

⁴¹ Ibid.

⁴² Paula Bennett (2016), “Speech to the Climate Change and Business Conference”, 11 October 2016. Retrieved from <https://www.beehive.govt.nz/speech/speech-climate-change-and-business-conference-0>

⁴³ Vivid Economics (2017), “Net Zero in New Zealand”; Kerr and Carver (2017), “Facilitating Carbon Offsets from Native Forests”; David Hall (2016), “Our Forest Future”, Auckland N.Z.: Pure Advantage; Parliamentary Commissioner for the Environment (2016), “Climate change and agriculture: Understanding the biological greenhouse gases”, 19 October 2016, Wellington N.Z.: Parliamentary Commissioner for the Environment.

⁴⁴ Reisinger, A., Kitching, R.L., Chiew, F., Hughes, L., Newton, P.C.D., Schuster, S., Tait, A., Whetton, P. (2014). *Australasia climate change 2014: Impacts, adaptation and vulnerability. Part B: Regional aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* In: [Barros, V.R., C.B. Field, D.J. Dokken, M.D. Mastrandrea, K.J. Mach, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds)] (ed.). Cambridge University Press: Cambridge, UK and New York, USA, pp. 1371-1438. Royal Society of New Zealand (2016). *Climate change implications for New Zealand*. Wellington: RSNZ.

- The lost value from climate-related degradation of green assets and natural resources (such as forests, freshwater resources, and native biodiversity) and hence the loss of economic value for primary industries, tourism, or green marketing for exporters.
- The lost value of stranded assets, which refers to capital expenditure allocated to high-carbon investments (such as fossil fuel reserves) which will not yield expected returns if high-emissions activities are priced out, restricted through regulation, or lose their markets through consumer choices.
- The opportunity cost of not realising the various economic, environmental and social co-benefits of climate projects, as well as multiplier effects from capital injections into local economics. As Vivid Economics notes, climate-aligned projects can improve the health of New Zealand's citizens, help reduce energy poverty, enhance mobility, [and] improve water quality".⁴⁵
- The opportunity cost of being a late-adopter and importer of low-emissions technologies, rather than a pioneer and exporter of technologies and knowledge that facilitates low-carbon outcomes.

A natural capital approach dictates that a responsible and prudent approach to climate finance will include not only the costs of investing into mitigation and adaptation, but also the costs of not doing so. Identifying these costs, and quantifying these costs where possible, is conducive to developing an effective regime of climate finance (see Section 5).

⁴⁵ Vivid Economics (2017), "Net Zero in New Zealand: Scenarios to Achieve Domestic Emissions Neutrality in the Second Half of the Century: Summary Report", Report prepared for GLOBE-NZ, March 2017, p.ii.

3. Introduction to Climate Finance

A number of different organisations are involved in mapping and tracking the landscape of climate finance including the UNFCCC's Standing Committee on Finance, Climate Policy Initiative, Overseas Development Institute (ODI), World Resources Institute (WRI), and others. As discussed later in §3.3, this leads to diverse and inconsistent methodologies and definitions.

Accordingly, this report focuses principally on Climate Policy Initiative's highly regarded *Global Landscape* reports. Climate Policy Initiative (CPI) is a US-based team of analysts and advisors that works to improve energy and land use policies around the world – including Brazil, China, Europe, India, Indonesia, and the United States. The focus on a single methodology reduces the risk of conceptual and definitional confusions that would result from switching between multiple methodologies. The principal reason for focusing on CPI's analysis is its strict methodology, which reduces the chance of double-counting and enables internal comparisons of changes to finance flows over time. CPI also relies on a useful and consistent classificatory system which permits illuminating distinctions between the various dimensions of climate finance, which include sources, intermediaries, recipients, instruments and uses.

3.1 Defining Climate Finance

The UNFCCC defines climate finance by the intended outcome of investment: “Climate finance aims to reduce emissions of GHGs, and to enhance sinks of GHGs and aims at reducing vulnerability of, and maintaining and increasing the resilience of, human and ecological systems to negative climate change impacts.”⁴⁶

In other words, climate finance funds projects that deliver mitigation benefits, adaptation benefits, or dual mitigation/adaptation benefits.

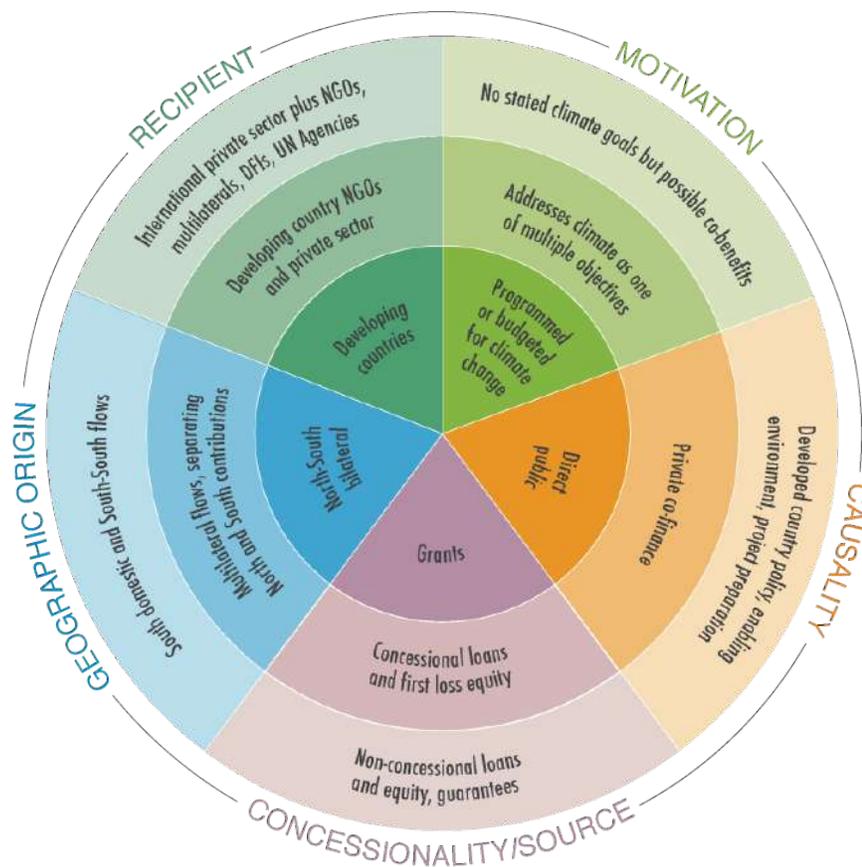
- **Mitigation** consists of actions to limit the magnitude or rate of long-term climate change, which generally involves reductions in total emissions of greenhouse gases, but also the sequestration of greenhouse gases in “sinks” such as forests.
- **Adaptation** refers to changes in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harms or exploits beneficial opportunities. Adaptation is also known as climate resilience.

⁴⁶ UNFCCC Standing Committee on Finance (2014), *2014 Biennial Assessment and Overview of Climate Finance Flows Report*, Bonn, Germany: United Nations Framework Convention on Climate Change (UNFCCC), p.5.

- **Dual benefits** refer to projects that contribute to both mitigation and adaptation, such as a forest that creates a carbon sink but also restores land resilience by reducing erosion and peak flood flows that eventuate from climate-related extreme weather events.

Climate finance can be channelled by public or private entities, or as blended finance which combines investments from both public and private sources. However, Climate Policy Initiative has found repeatedly through its analysis of global climate finance that public finance drives private investment.⁴⁷ This parallels the discussion of government roles in impact investment markets in §1.3.

Climate Policy Initiative identifies five key variables as significant for defining and evaluating climate finance:



⁴⁷ Barbara Buchner, Chiara Trabacchi, Federico Mazza, Dario Abramskiehn and David Wang (2015), "Global Landscape of Climate Finance 2015", San Francisco: Climate Policy Initiative. Barbara Buchner, Federico Mazza and James Falzon (2016), "Global Climate Finance: An Updated View on 2013 and 2014 Flows", San Francisco: Climate Policy Initiative.

Source: Climate Policy Initiative, 2015.⁴⁸

1. **Motivation:** the extent to which a financial intervention was designed to support climate mitigation, adaptation or dual benefit outcomes.
2. **Causality:** the extent to which a contributor's intervention (whether finance or policy) can be said to have mobilised investment in climate-relevant activities.
3. **Concessional source:** the degree to which public or private finance prioritises climate objectives by providing concessional terms compared to a market rate loan.
4. **Geographic origin:** the geographic flows of finance with a particular focus on flows from developed to developing countries (the global North to the global South).
5. **Recipient:** the agency or entity which holds and manages the finance provided in a global context.

3.2 The Scale and Shortfall of Global Climate Finance

Total climate finance is estimated as anywhere between US\$391 billion in 2015⁴⁹ to US\$714 billion in 2013/2014.⁵⁰ The discrepancy in these estimates is because there is not yet a single universal methodology for defining or classifying climate finance, as well as varying levels of uncertainty in relation to relevant data.

Climate Policy Initiative's analysis shows that climate finance is increasing. Total climate finance increased in 2014 by 18% from US\$331 billion to an estimated US\$391 billion in 2015. Crucially, this was largely driven by public investment: contributions by governments and intermediaries reached between US\$144–152 billion in 2014, an 8% increase from 2013 levels and a 10% rise from 2012. Public climate finance constitutes around 38% of total global flows, while the remainder flows from private sources.

Despite the upward trend, the range of annual global climate finance (US\$391–714 billion) still falls short of estimates required to support national climate pledges. According to a 2015 International

⁴⁸ Paul Bodnar, Jessica Brown, and Smita Nakhoda (2015), "What Counts: Tools to Help Define and Understand Progress Towards the \$100 Billion Climate Finance Commitment", Climate Policy Initiative, World Resources Institute, Overseas Development Institute.

⁴⁹ Barbara Buchner, Chiara Trabacchi, Federico Mazza, Dario Abramskiehn and David Wang (2016), "Global Landscape of Climate Finance 2015", San Francisco: Climate Policy Initiative.

⁵⁰ UNFCCC (2016) Standing Committee on Finance, 2016 Biennial Assessment and Overview of Climate Finance Flows Report, pp.6.

Energy Agency report,⁵¹ US\$900 billion in annual investment is required (or US\$13.5 trillion over the next 15 years) into energy efficiency and low-carbon technologies for parties to meet Nationally Determined Contributions made in Paris in December 2015. That same report concludes that a further US\$200 billion in additional annual investment (or US\$3 trillion over 15 years) would be required over the same period to limit the global temperature increase to 2°C, given that current NDCs are predicted to fall short of this outcome.

Another recent study looked more broadly at core infrastructure, including power, transport, water and waste, and telecommunications – which is funded globally at around US\$3.4 trillion per annum in 2015, up by about US\$1 trillion per annum over the past decade. However, it estimates that total investment over the next 15 years needs to be in the order of US\$80 trillion (or around \$5–\$6 trillion on average per annum).⁵² The Global Commission on the Economy and Climate (GCEC) 2014 report estimates that an additional US\$30 trillion or so will be needed over the next 15 years for energy efficiency and primary energy production (which along with social infrastructure like schools and hospitals is not defined as core infrastructure).

Taking a more holistic approach, the United Nations Conference on Trade and Development (UNCTAD) has estimated that it will cost US\$3.9 trillion a year to achieve the Sustainable Development Goals in developing countries alone. Current levels of both public and private funding cover only US\$1.4 trillion, leaving an annual shortfall of an estimated US\$2.5 trillion.⁵³ Such funding would align climate goals with development objectives, pre-empting the development challenges that lock-in countries to a high emissions development pathway.

Finally the OECD estimates that from 2016 to 2030, to address global population growth alone without factoring in climate change, around US\$95 trillion of investments in energy, transport, water and telecoms, or US\$6.3 trillion per year, are required. When climate change is factored in, this rises to US\$6.9 trillion per year. However, the OECD further notes that this additional investment could be offset by energy savings rising to US\$1.7 trillion per year up to 2030.⁵⁴

3.3 Challenges and Limitations

These estimates require caveats. The climate finance space is relatively new and therefore methodologically fragmented. There remains a lack of common definitions for climate finance and

⁵¹ International Energy Agency (2015) *Energy and Climate Change: World Energy Outlook Special Report*, Paris: IEA.

⁵² Bhattacharya, A., Meltzer, JP., Oppenheim, J., Qureshi, Z., Stern, N. (2016). "Delivering on Sustainable Infrastructure for Better Development and Better Climate." Brookings Institute, New Climate Economy and Grantham Research Institute on Climate Change and the Environment.

⁵³ United Nations Conference for Trade and Development (2014), *World Investment Report, Investing in SDG's: An Action Plan*, Geneva: UNCTD, pp.xi.

⁵⁴ OECD (2017), *Investing in Climate, Investing in Growth*, p.28.

for activity boundaries (particularly for adaptation), as well as substantial differences in how climate finance is tracked and reported. There are also major data limitations and therefore accounting gaps in global finance.

The *Global Landscape* reports are the benchmark in climate finance analysis – and hence the foundation for this report. However, Climate Policy Initiative makes clear that their accounting does not capture the full value of climate-relevant financing. Although their analysis is increasingly broad, the most recent Climate Policy Initiative report omits private investment into energy efficiency, transport, land use and adaptation.⁵⁵ In regard to public funding, Climate Policy Initiative captures only some national commitments through Development Finance Institutions, financing tracked by Bloomberg New Energy Finance (BNEF), and climate finance contributed by governments as shareholders of companies.

This leaves substantial omissions which ought to be kept in mind. It also points to the challenges for accounting for domestic climate finance in New Zealand. Accordingly, this report provides only an indicative survey of domestic climate finance flows in New Zealand. It is beyond the scope of this report to provide reliable estimates of the total volume of these finance flows, the likelihood that such finance is sufficient to fulfil emissions targets, and the comparative scale of domestic climate finance in New Zealand *vis-à-vis* other countries.

⁵⁵ Barbara Buchner, Chiara Trabacchi, Federico Mazza, Dario Abramskiehn and David Wang (2016), “Global Landscape of Climate Finance 2015”, San Francisco: Climate Policy Initiative.

4. Climate Finance Instruments

This section begins with Climate Policy Initiative's framework of financial instruments. This project-level classification breaks down climate financing into balance sheet financing, market debt rate, low-cost debt, equity, and grants. This provides not only a way to better understand the climate financing that already occurs in New Zealand, but also helps to identify the gaps that could be filled by future financing opportunities. To provide a sense of distribution, the graph below shows the proportion of global climate finance in 2014 committed through these various instruments.

Global Climate Finance Breakdown by Instrument Type



Source: Climate Policy Initiative (2014) 2015

However, there are more complex or exotic instruments which are not well captured by the Climate Policy Initiative typology, such as bonds or integrated instruments. These are discussed in the latter part of this chapter.

4.1 Grants

What is a Grant?

Grants include cash transfers or the provision of in-kind support for which recipients incur no legal obligation for repayment. Transfers can be made in cash, goods or services. Grants are

commonly provided for investment support and/or policy-based support. Grants may be best suited to the funding of specific technical assistance, capacity-building and training needs.⁵⁶

Grant funding in New Zealand is driven by both central and local government. It is also currently the default method through which philanthropic funders would support projects and organisations.

Many climate-aligned grants in New Zealand are used to address environmental problems where the costs are externalised. For example, grants for erosion control are designed to reduce the long-run costs of soil loss or waterway sedimentation which fall disproportionately on future generations and wider communities. There are mixed views on whether providing grants to address market failure is legitimate, effective and efficient, and when grants are the best instrument to be used.⁵⁷

Currently, in New Zealand grants are not always supported by a strategic investment pathway that provides long-term sustainability to funded initiatives. In terms of cultivating investment opportunities, the provision of grants plays an important role in fostering ecosystems of innovative ideas and developments which could one day become self-sustaining commercial ventures. Start-up grants are likely to be relatively small in financial value, compared to the overall project cost, and applied for and distributed at an early or concept stage of the project's development trajectory. However, international practice also demonstrates that grants for established companies can be substantial: for example, the US Treasury Department has provided US\$497.5 million in direct grants to Elon Musk's SolarCity to cover 30% of the cost of solar panel installation.⁵⁸

A light-touch review of climate-aligned grants in New Zealand reveals a range of grant-making activity by central and local government, as well as philanthropic funders. There exists an opportunity for the New Zealand Government to build out its role as investment manager for climate change to provide a greater level of strategic direction to other grant-making participants so that they can provide future grants in a cohesive and coherent manner. However, there is a growing community of practice around *angel investing*, *impact investing* and *venture philanthropy* which is steering participants toward a more sophisticated approach.

⁵⁶ Geraldine Baudienville (2009), "Beyond grants: climate finance in developing countries", London: Overseas Development Institute, p.2.

⁵⁷ Kees van der Meer and Marijn Noordam (2004), "The World Bank: The Use of Grants to Address Market Failures: A Review of World Bank Rural Development Projects", Agriculture and Rural Development Discussion Paper 27, p.3.

⁵⁸ This is part of US\$4.9 billion in grants, tax breaks, factory construction, discounted loans and environmental credits from the US Government received by Tesla Motors Inc., SolarCity Corp. and Space Exploration Technologies Corp., known as SpaceX.

4.1.1 New Zealand Examples

- **Callaghan Innovation** is a government agency that functions as an incubator and accelerator of high-technology ideas, while also providing a range of grants to compliment R&D efforts of selected companies. However, it does not cite climate change as a priority for interest or expertise. Grants can be up to 20% of total R&D expenditure and up to NZ\$5 million.
- **Low Emission Vehicles Contestable Fund** provides up to NZ\$6 million per year (up to NZ\$4 million in 2016/17) to co-fund up to 50% of projects with private and public-sector partners in areas where commercial returns aren't yet strong enough to justify full private investment. These projects must contribute to one of the following objectives: (1) increasing the variety and supply of electric vehicles (EVs) available; (2) improving the availability of servicing or charging infrastructure in areas where demand is not fully developed; (3) increasing demand for EVs; and (4) developing innovative products or systems to take advantage of growing EV usage.
- **Warm Up New Zealand** provides a limited number of grants for 50% of the cost of ceiling and underfloor insulation (landlords pay up to 50% of the cost of the retrofit) which are available on a first-come-first-served basis if the rental property meets the following criteria: (1) Rental property was built before the year 2000 and (a) the named tenant has a Community Services Card or (b) the named tenant is referred by the Ministry of Health's Healthy Homes programme; and (2) the rental property is not owned by a Government agency.
- **Energy Efficiency and Conservation Authority (EECA)** distributes an array of grants under its EECA Business Programme. They include Commercial Building Performance Advice (up to 100% of cost of design advice to NZ\$15,000 maximum), Industrial Systems Design Advice (up to 40% of agreed quotation to NZ\$100,000 maximum), Feasibility Studies and Business Cases (up to 40% of cost to NZ\$50,000 maximum), Energy Audits (up to 40% of cost to NZ\$20,000 maximum per audit), Systems Optimisation (up to 40% of cost to NZ\$100,000 maximum), Monitoring and Targeting (up to 40% of programme to NZ\$100,000 maximum), Energy Management Benchmark Service (full cost of diagnostic session), Technology Demonstrations (up to 40% of cost to NZ\$100,000 maximum), and Energy Management Plan (up to 40% of cost of establishing plan to NZ\$100,000 maximum).
- **Afforestation Grant Scheme** provides grants of NZ\$1,300 per hectare for growers to plant new small to medium-sized forests (5 hectares to 300 hectares). Up to NZ\$19.5 million is available between 2015–2020.

- **Sustainable Land Management and Climate Change (SLMACC) Research Programme** distributes funds of around NZ\$2.5 million per year, with the majority (NZ\$2.2 million) available to regional councils and unitary authorities through a contestable fund for projects that help hill-country farmers treat erosion-prone land and implement sustainable management practices.
- **Pastoral Greenhouse Gas Research Consortium (PGgRc)** is a consortium of agricultural industry organisations that invest their funds and levies to develop climate mitigation solutions through research, in partnership with the New Zealand Government. The currently PGgRc invests NZ\$5.4 million annually via a 50/50 funding partnership with the Ministry of Business, Innovation and Employment (MBIE). These funds totalled NZ\$37 million from 2004–2012 and approximately NZ\$37.8 million from 2013–2019.
- **New Zealand Agricultural Greenhouse Gas Research Centre (NZAGRC)** is funded by the Ministry for Primary Industries (MPI) via its Primary Growth Partnership fund and partners with nine New Zealand research organisations: AgResearch, DairyNZ, Landcare Research, Lincoln University, Massey University, NIWA, PGgRc, Plant & Food Research, Scion. The NZAGRC investment is NZ\$4.8 million per year and is dedicated to developing agricultural emissions reducing technologies and practices across the full suite of GHGs generated by agriculture, encompassing methane from both enteric fermentation and manure management, nitrous oxide from agricultural soils, and the management of soil carbon.
- **Global Research Alliance on Agricultural Greenhouse Gases (GRA)** was launched in December 2009 and now has 47-member countries from all regions of the world. Financially, New Zealand has allocated a total of NZ\$65 million to the GRA to accelerate global research in mitigating GHG emissions from pastoral livestock. The most recent financial boost to the GRA came at the Paris COP21 climate forum in 2015, where New Zealand announced that it would provide a further NZ\$20 million in support of the GRA in addition to the original allocation of NZ\$45 million. Other alliance member countries provide additional, significant cash or in-kind funding to shared activities.
- **Erosion control** funding usually involves land use change from pasture to forest or native regeneration, and although the principal purpose is to reduce erosion and sediment loss, a secondary outcome is the sequestration of atmospheric carbon. This is a dual mitigation/adaptation benefit programme. Two significant erosion funds, both operated by MPI, are the Sustainable Land Management Hill Country Erosion Programme (SLM) and the Erosion Control Funding Programme (ECFP), formerly the East Coast Forestry Project.

- **The Sustainable Farming Fund (SFF)** invests in applied research and projects led by farmers, growers, or foresters to encourage sustainable farming. Again, although climate mitigation is not an explicit outcome, sustainable management regimes could result in reduced greenhouse gas emissions, increased carbon sequestration in soil or vegetation, and increased climate resilience for food and land. Applicants can apply for up to NZ\$200,000 a year for a maximum of 3 years.
- **Trees that Count** is funded by The Tindall Foundation, and delivered by the Project Crimson Trust in partnership with Pure Advantage and the Department of Conservation. The initiative aims to keep a live count of the number of native trees being planted across the country from 2017 and to set a new target each year thereafter. The project specifically identifies climate change mitigation as a motivation for its creation and acts as a platform for other grantees (private or corporate) to make donations to its cause.

4.2 Balance Sheet Finance

This refers simply to financing where a company can borrow corporately based on the cash flows of the company to invest into climate-aligned activities or assets. In other words, the future cash flow stream related to the investments (which could be a reduction in costs or increase in revenues) is typically internalised to the company. This differs from project-level finance, where the cash flows are ring fenced to service external debt or equity but the WACC (weighted average cost of capital) is based on the project's ability to service debt rather than the company's.

The predominance of balance sheet financing in the *Global Landscape* reports – about 45% of total climate finance flows in 2014 – reflects several things: (1) the dominance of private finance (61%) among total climate finance flows; (2) it is more effective to finance smaller projects internally; (3) debt can itself be difficult to secure from external sources; (4) high costs of capital from external sources; and (5) the accessibility and quality of balance sheet financial records means that this finance may be over-represented by research.

4.2.1 New Zealand Examples

- **Renewable Energy generation by the 'big five' gentailers:** The electricity sector in New Zealand is dominated by five generator-retailers, which are Contact Energy, Genesis Energy, Mercury Energy, Meridian Energy, and Trustpower. Between these five companies they produce or control more than 95% of NZ's total electricity generation. Genesis Energy, Mercury Energy, Meridian Energy, and Trustpower would have likely financed New Zealand's 19 wind farms (either operating or under construction). These wind farms

currently supply nearly 5% of New Zealand’s annual electricity generation. Contact Energy and Mercury Energy will have also likely financed their geothermal electricity generation via balance-sheet financing.

4.3 Project Finance

Project Finance is a combination of external debt and equity based on limited or non-recourse structures – typically, Special Purposes Vehicles (SPVs) or limited liability partnerships – where the capital invested is paid back from the cash flow generated from the project.

The best current examples in New Zealand are Public Private Partnerships (PPP). PPPs are long-term contracts between the public sector (a Public-Sector Client) and a private company or consortium of companies (a Private Entity) covering the design, construction, maintenance, and financing of an infrastructure asset. PPPs can take many different forms, but typically have the following characteristics:⁵⁹

- a Public-Sector Client enters into a contract with a Private Entity to provide finance and arrange the design, construction and ongoing operation of an asset.
- the Public-Sector Client undertakes to pay for use of an asset for a specified term normally ranging from 15 to 35 years (the Concession).
- at the end of the Concession, ownership of the asset is returned to the Public-Sector Client, who can continue to use the asset.

A key distinction between PPPs and traditional procurement methods is that the risks associated with the ownership and operation of an asset are largely borne by the private sector rather than public sector, although this risk is compensated for by increased returns for private sector investors.

4.4 Equity Instruments

What is an equity instrument?

Equity is an individual or entity’s degree of ownership in any asset after all debts or liabilities associated with that asset are accounted for. Equities are one of three main asset classes along with debt and cash or cash equivalents. Shares in a company are one kind of equity as they represent an ownership interest in that company. If that ownership is in a privately held company, then any associated activity concerning that ownership interest is called *private equity*. By contrast,

⁵⁹ New Zealand Social Infrastructure Fund website (2009). Retrieved 1 August 2017 from <http://www.nzsif.co.nz/Social-Infrastructure/What-are-Public-Private-Partnerships/>

public equity is the opposite to private equity in the sense that individuals and/or organisations can buy ownership in shares of a company only through a public market such as the New Zealand Stock Exchange (NZX). In regard to climate finance, equity must correspond to interests in companies that deliver mitigation, adaptation or dual benefits.

Formal engagement with basic ESG (environmental/social/governance) principles in New Zealand's equity markets is weak but growing. As at 31st December 2016, responsible investment constituted NZ\$131.3 billion assets under management, up by 67% from NZ\$78.7 billion 2015. The volume taking a more discerning ESG integration approach was lower, up 15% on the previous year to NZ\$88.6 billion.⁶⁰ There is, as yet, no specific criteria for classifying low-emissions investments, although there is potentially a growing demand.

4.4.1 New Zealand Examples

Public and Private Equity Marketplaces: In 2017, the NZX joined the United Nations Sustainable Stock Exchange (SSE) initiative. The SSE is a peer-to-peer learning platform for exploring how exchanges – in collaboration with investors, regulators, and companies – can enhance corporate transparency and performance on ESG objectives and encourage sustainable investment. SSE records⁶¹ reveal the lack of focus, thus far, on sustainable investment in public equity markets in New Zealand.

Criteria	Detail
Number of listed companies (Dec 2016)	189
Market capitalisation in millions (Dec 2016)	US\$81,662
Requires ESG reporting as a listing rule?	No
Offers written guidance on ESG reporting?	No
Provides sustainability-related indices?	No
Has green bond listings?	No

In 31 August 2016, a consultation paper was conducted by NZX on its Corporate Governance Code, which sought feedback on whether to introduce any additional recommendations or commentary in relation to non-financial reporting matters, including ESG reporting. Although there was wide support for ESG disclosure, nearly all respondents emphasised the need for flexibility to ensure that NZX did not impose a disproportionate compliance burden on issuers where these measures might

⁶⁰ Responsible Investment Association Australasia (2017), *Responsible Investment Benchmark Report 2017: New Zealand*. Report prepared by KPMG and RIAA.

⁶¹ Sustainable Stock Exchanges Initiative website (2013) Retrieved 16 July from <http://www.sseinitiative.org/fact-sheet/new-zealand-exchange>.

be of limited materiality. The majority of submitters supported introducing this as “commentary” initially, which is an approach supported by guidance published by the Sustainable Stock Exchange Initiative. Subsequently, the NZX does not propose to adopt a specific recommendation in relation to ESG reporting. However, it has incorporated commentary which outlines that non-financial reporting may extend to ESG reporting.

Investors: The largest potential equity investor into climate-aligned investments in New Zealand is the NZ Super Fund. On 19th October 2016, NZ Super Fund announced a new investment strategy which is designed to make the fund more resilient to climate change. CEO Adrian Orr remarked: “Climate change, and the coming transition to a low-carbon energy system... present investment opportunities for long-term investors that we intend to capture.” Publicly available information on this strategy is limited to four principles: (1) *Reduce*: working to significantly reduce the Fund’s exposure to both fossil fuel reserves and carbon emissions. (2) *Analyse*: climate change considerations will be incorporated into investment analysis and decisions (3) *Engage*: continue to manage climate risks by being an active owner (4) *Search*: we are intensifying our efforts to actively seek new investment opportunities in the areas of alternative energy, energy efficiency and transformational infrastructure. As at 30 June 2017, the total Fund’s carbon emissions intensity is 19.6% lower, and its exposure to carbon reserves is 21.5% lower, than if the changes hadn’t been made. This transition involved reallocating NZ\$950 million away from companies with high exposure to carbon emissions and reserves into lower-risk companies.⁶²

Fund managers: New Zealand has few examples of fund managers who are prioritizing some positive impact over financial returns. One example is the QuayStreet Balanced Social Responsible Investment Fund (SRI Fund) which was launched in 2007 and is NZ\$32 million in net asset value. However, the QuayStreet Balanced SRI Fund has very little exposure to New Zealand equities which contribute to climate change mitigation or adaptation strategies. According to the QuayStreet SRI Fund’s fact sheet, as of May 2017, just 13.1% is invested in equities which could include New Zealand equities. Of that 13.1%, the top five equity securities listed are international indexes, fore mostly the MSCI World ESG TRS (MSCI ESG) which tracks 831 companies from 23 developed market countries.⁶³ Of the New Zealand listed constituents include Contact Energy 0.01%, Meridian Energy 0.01%, Auckland Airport 0.01%, Spark New Zealand 0.01% and Ryman Healthcare 0.01%. The only indirect connection to New Zealand-based climate assets is the 24.3% invested in Australian and New Zealand fixed income securities, which includes ANZ’s AU\$600 million Green Bond which includes the Mahinerangi and Tuararua wind farms among its assets (see §4.6.5).

⁶² NZ Super Fund (2017), “NZ Super Fund Shifts Passive Equities to Low-Carbon”.

⁶³ Developed Markets countries include: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, the UK and the US.

Companies: Equity ownership takes place at all stages of a company's life cycle. Typically, a very young company has very little or no revenue to borrow money from investors or other financial institutions. Therefore, in the early developmental stages, *angel investors* (friends and family of the company founder, or high-net-worth individuals) will transfer money to the company in exchange for a relatively high percentage of ownership in the company. This high percentage usually reflects the high risk that investors are taking that the company could fail. Once the company has proven a level of "product-market fit", *private equity investors* (funds, foundations, individuals) may purchase shares to fund the various growth stages of the company. If the company is successful in becoming a substantial business and would like to raise further funding via public equity markets, they would do so through an initial public offering or IPO.

One example of a climate-aligned venture is Lanzatech, which converts carbon-rich industrial wastes and residues into biofuels and chemical products. This early-stage company was founded in New Zealand in 2005, with a pilot plant at the Glenbrook Steel Mill south of Auckland. It received approximately NZ\$14 million from New Zealand Government grants and private investors before going on to successfully raise an additional US\$200 million from a variety of leading venture capital firms and strategic partners, including Silicon Valley venture capital fund Khosla Ventures. In 2014, the company relocated to the United States. Notable New Zealand investors include NZ Super Fund at NZ\$85 million and Sir Stephen Tindall's K1W1 fund at NZ\$1.5 million. Although Lanzatech is still early stage, the company shows promise. It has succeeded in creating an investment pathway for transforming high-emissions waste into useful by-products – a climate-aligned example of "doing good by doing well". However, Lanzatech's reliance on overseas investment and eventual relocation offshore illuminates the difficulties faced by New Zealand companies in securing a pipeline of finance to support different stages of a company's lifecycle. This could reflect the scale of New Zealand's investment community, its priorities and/or appetite for risk, or a combination of both.

Equity-based crowdfunding: Online crowdfunding is an emerging market for early stage companies to raise investment capital. Snowball Effect is a leading private equity investment marketplace in New Zealand and has been operating since 2014. Snowball Effect facilitates investments of up to NZ\$2 million via public offers, private offers, and wholesale investor offers. Although it does not specifically highlight climate change as an investment priority, it has facilitated equity investments into clean technology, such as CarbonScape, who raised over NZ\$700,000 in 2014. There do not seem to be any other climate related investment facilitated through Snowball Effect since 2014.

4.5 Debt Instruments

What is a debt instrument?

Debt is an amount of money borrowed by one party from another. Debt is one of three main asset classes along with shares, equity and cash equivalents (other assets that can be quickly turned into cash). The most common form of debt is a loan. In this case, the borrower is required to repay the balance of the loan by a certain date. For individuals, the largest loan that they are likely to make is a mortgage to fund the purchase of a house, but this could also cover car finance and personal credit cards. Companies and governments may choose to borrow money through a debt instrument like a bond (see §4.6)

Debt is used by many companies and individuals as a method of funding an activity or purchase that they could not or do not want to fund under normal circumstances. A debt arrangement gives the borrowing party permission to spend the money under the condition that it is to be paid back at a later date, usually with coupon or interest rate. The coupon is used as a way to ensure the lender is compensated for the risk that the borrower may not pay the loan back, as well as limit the amount of time the borrower can owe the money to the lender.

4.5.1 Market-rate Debt

Market rate debt refers to debt which incurs interest at, or close to, standard market rates. In other words, it is *non-concessional*: there are no concessions being made in light of the climate-aligned motivations for incurring the debt.

4.5.1.1 New Zealand Examples

- **Westpac Bank**, in its 2016 Sustainability Review, reports that it increased total new lending to the CleanTech sector to NZ\$325 million since 2012. Westpac has also committed to a new target of NZ\$100 million in gross new lending over the next two years. This is targeted lending to businesses whose products and services support the transition to a low carbon economy, undertaken through a survey of approximately 500 New Zealand CleanTech and Environment Network (NZCEN) members. Increased CleanTech investment is also aligned with a 30% reduction in fossil fuel assets since 2012, in order to facilitate a gradual divestment of capital which contributes to carbon emissions. However, it is important to note that total sector lending in 2016 was NZ\$1.29 billion. Although it is positive to see a large commercial bank prioritise finance to this space, new lending of NZ\$100 million to 2019 represents under 8% of total lending to the CleanTech industry by Westpac (and likely

to established renewable energy utility companies) signalling a clear lack of finance to new and emerging initiatives.

4.5.2 Low-cost Debt

Low-cost debt involves loans for which repayment is required, yet which are provided at terms preferable to those prevailing on the market including, for example, longer loan tenors, grace periods, or lower interest rates. In other words, the debt is concessional.

Climate Policy Initiative argues that access to low-cost debt is critical for driving investment in more challenging markets and novel technologies (Trabacchi et al., 2016). Investment loans, in particular, finance the creation and rehabilitation of social and economic infrastructure and institutional development.

4.5.2.1 New Zealand Examples

- **KiwiBank Sustainable Energy Loan** enables customers to top up their home loans to install a sustainable energy system through solar power, wind energy, small-scale hydro or geothermal resources. For loans of over NZ\$5,000, KiwiBank contributes up to NZ\$2,000 (over four years) towards the cost of the system: NZ\$800 at the end of the first year and NZ\$400 at the end of each of the three years after that.
- **EECA** distributes Crown Loans to the value of NZ\$2 million per year. These are a low-cost, interest-free way to fully or partially fund energy efficiency and renewable energy projects for public sector organisations such as schools, local councils, universities and polytechnics, government departments and hospitals. The project payback period must be less than five years and the loan itself must be repaid within five years. Crown Loans are low cost, interest-free with a one-off flat rate procurement fee of 6% to cover EECA's establishment and loan administration costs. Examples of projects funded include installing building management systems; installing and upgrading equipment such as energy efficient space heating, efficient refrigeration, energy efficient lighting; EVs; installation of biomass boilers; and installing solar water heating for swimming pools.
- **Meridian Energy and Westpac** partnered in 2013 on a solar panel initiative called Solar Shed. In 2012, EECA audited over 150 dairy farms in 2011 and identified that there are immense opportunities for savings through energy efficiency. The Solar Shed package includes a high-quality grid connected solar (PV) system and installation, 100% Equipment Finance loan (with a 3-year term) at Westpac's special reduced interest rate.

Auckland Council runs the Retrofit your Home program for Auckland Council ratepayers. The program is designed to improve the quality of housing for Aucklanders by enabling better access to energy efficiency retrofit measures. The primary outcomes targeted are improved local air quality, installing insulation, clean heating and financial savings for households. Ratepayers can apply for up to NZ\$5,000 financial assistance to access several different home improvement interventions: home insulation, clean heating, fireplace removal, bathroom or kitchen mechanical extraction, water tank installation, water efficient devices. Ratepayers borrow at an interest rate of 6.6% and repay the loan over 9 years via a targeted rate included on their rates bill.

4.6 Bonds

What is a Bond?

A bond is a debt instrument in which an investor loans money (called the principle) to an entity (typically a company or government). The borrower may wish to fund a new project, maintain ongoing operations, or restructure other existing debt obligations. The entity borrows the money for a specified period of time. Over that period, the borrower agrees to pay back the principal, plus a coupon/interest rate which is usually expressed as a percentage of the total money borrowed. This fee could change over the period or be fixed, depending on the exact nature of the agreement. The bond is usually issued with an agreement on how much and when the coupon will be paid, as well as when the loan funds will be returned to the investor.

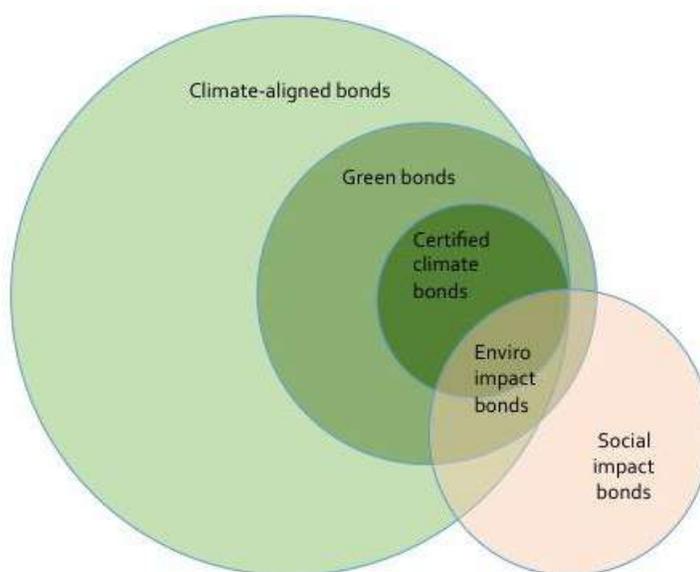
The entity which ultimately “pays down” the finance can vary depending on the instrument being used to borrow the funds. For example, in the impact bonds structure discussed in §4.6.4, the government is the party paying on a pay-for-performance basis. This is also the case in the Permanent Forest Bond proposal in §6.2. It is worth noting that this is not typically the case in green bonds (see §4.6.2) more generally, where funds might be part of a wider corporate finance approach for a corporate entity.

The issuance of bonds that are aligned to low-emission outcomes is one way to channel capital investment into mitigation, adaptation and dual-benefit projects. Bonds that align with the low-carbon transition include climate-aligned bonds, green bonds, climate bonds and environmental impact bonds (discussed in detail below).

Presently, climate-aligned bonds are not well-captured by climate finance surveys. Climate Policy Initiative notes: “Most green bonds issued to date utilize a ‘use of proceeds’ format where the funds raised are earmarked either to refinance green projects that already exist on an issuer’s balance

sheet or to finance new projects.” But Climate Policy Initiative’s *Global Landscape* reports have “a project-level focus... in order to be sure that we are tracking new annual climate finance flowing to climate actions. This means that, although we do not track the funds raised by green bonds, we may already have captured the end-use investment they are linked to.”

Figure 3 below shows how the relevant bond types fit together. (Note: this graph is pictorial and does not represent the scale of investment.) *Climate-aligned bonds* is a catch-all term for any bond that delivers climate-friendly outcomes. *Green bonds* are bonds that meet the very broad standards of the Green Bond Principles. *Certified climate bonds* are bonds that meet the rigorous standards and auditing requirements designed by Climate Bonds Initiative to ensure transparency and investor confidence. *Impact bonds* are an overlapping class of bonds based upon pay-for-performance contracts, these days a familiar feature in the social investment landscape through *social impact bonds*, but with emerging potential to be issued in the environmental sector as *environmental impact bonds*, or as *integrated impact bonds* that deliver combined social and environmental benefits.



Climate-aligned bonds can be issued by private or public entities. Issuance of green bonds and certified climate bonds by commercial banks and local government (such as municipal bonds) is commonplace (see §4.6.5 for examples in Australia). Issuance of green bonds by national governments is less common, although Poland issued the first green sovereign bonds in December 2016, followed by France in January 2017.

At the present time, green sovereign bonds are not being considered in New Zealand. The central obstacle is that green bond issuance creates a number of legal complexities for sovereign issuers, as well as opening the door to risks related to the integrity of the instrument. Furthermore, green bond issuance involves additional costs without any reduction in funding costs. However, this is not an impediment to non-sovereign issuance of bonds, such as issuance of green bonds by commercial entities like banks or local councils. Additionally, there are certain kinds of debt instrument that are commonly classified as “bonds” – specifically, the *impact bonds* discussed in §4.6.4 and §6.2 – which

involve sovereign entities paying for performance or outcomes, rather than issuing debt. As long as the activities or projects that flow from the use-of-proceeds from impact bonds are privately owned, these bonds are not regarded a sovereign issuance and therefore not constrained by the considerations discussed above.

4.6.1 Climate-aligned Bonds

Climate-aligned bonds refer to any privately or publicly issued bond which finances projects with climate mitigation and/or adaptation outcomes. This definition captures not only labelled green bonds with “use of proceeds” defined and labelled as “green” (see 4.3.2 below), but also unlabelled bonds which nevertheless provide finance for low carbon assets.

The climate-aligned bond market constitutes around 3,590 bonds from 780 issuers at a value of US\$694 billion.⁶⁴ The majority of such bonds, identified as “climate-aligned” by Climate Bonds Initiative’s 2016 analysis, are transport bonds (67%), followed by energy bonds (19%), with the remainder financing a range of low carbon assets in water, buildings and industry, agriculture and forestry, and waste or pollution control. Labelled green bonds constitute only 17% of the climate-aligned bond market.

4.6.2 Green Bonds

Green bonds are debt instruments where the capital raised is used *exclusively* to finance or refinance environmentally friendly projects, which may or may not be aligned to climate objectives. Labelled green bonds currently stand at an issuance of around US\$118 billion, about 17% of the total climate-aligned bond market. However, the labelled green bonds are growing strongly, at a rate of 11% between 2015 and 2016.⁶⁵ Moreover, the Paris Green Bonds Statement presented to COP21 in 2016 made a declaration to support and develop the growth of green bonds by asset owners, investment managers and individual funds that managed a combined US\$11.2 trillion of assets.

The Green Bond Principles (GBP), updated as of June 2016, are voluntary process guidelines which recommend a clear process and disclosure for issuers, which investors, banks, investment banks, underwriters, placement agents and others may use to understand the characteristics of any given Green Bond. These principles recommend transparency and disclosure and promote integrity in the development of the Green Bond market.

⁶⁴ Climate Bonds Initiative (2016), *Bonds and Climate Change: State of the Market in 2016*. Report prepared by Climate Bonds Initiative, commissioned by HSBC, pp.2–4.

⁶⁵ Climate Bonds Initiative (2016), *Bonds and Climate Change*, pp.6–7.

Green Bonds are any type of bond instrument where the proceeds will be exclusively applied to finance or refinance in part or in full new and/or existing eligible Green Projects and which are aligned with the four core components of the GBP. These four components are:

1. **Use of Proceeds:** All designated Green Project categories should provide clear environmental benefits, such as renewable energy, energy efficiency, pollution prevention and control, sustainable management of resources, biodiversity conservation, clean transport, sustainable water management, climate change adaptation, and so on.
2. **Process for Project Evaluation and Selection:** A Green Bond should be supported by a process that determines environmental benefits, related eligibility criteria, and sustainability objectives. It is recommended (though not mandatory) that this is supplemented by an external review.
3. **Management of Proceeds:** The net proceeds should be tracked appropriately and attested by a formal internal process. It is recommended (though not mandatory) that this is supplemented by a third-party auditor.
4. **Reporting:** Issuers should provide annual information until full allocation, and as necessary thereafter in the event of new developments, which detail how proceeds have been allocated and expected impact.

4.6.3 Climate Bonds

For this report, “climate bonds” refers specifically to bonds included within the Climate Bonds Standard and Certification Scheme that was developed and operated by Climate Bond Initiative, an investor-focused not-for-profit organisation committed to pioneering climate finance. Certified climate bonds are emerging as “the gold standard”, a sub-set of labelled green bonds that are more scientifically rigorous, that meet impact and disclosure criteria, and that must be independently audited.

The Climate Bonds Standard and Certification Scheme is a labelling scheme that provides clear, sector-specific eligibility criteria for assets and projects that can be used for Climate Bonds and Green Bonds. Criteria are developed by the Climate Bonds Standard Board, which convenes scientists, investors and other specialists in expert committees to define what can be financed. These enable investors and governments to prioritise green and climate bonds with confidence that their associated investments genuinely contribute to a low carbon economy.

This certification process goes beyond the Green Bond Principles, which are broadly defined and for which external review is only voluntary. The CBI Certification Scheme addresses investor

concerns about the credibility of green bonds, securing these bonds against accusations of ‘greenwashing’. Standards, assurance and certification improve confidence and transparency in green bonds markets.

Climate bonds are still relatively new, although increasingly being issued around the world. Sector specific standards for water, solar, wind, low carbon buildings, geothermal and low carbon transport are fully functioning. Standards for bioenergy and land use are awaiting board approval having undergone public consultation.

	Green Bond Principles	Project Eligibility	External Review
Green Bond	Yes	Broadly defined	Voluntary (recommended full or partial review by consultants, verification, certification or rating).
Climate Bond	Yes	Strictly defined (Climate Bonds Taxonomy and Sector-Specific Criteria)	Mandatory assurance framework with independent verifiers and certification by independent Climate Bonds Standard Board.

4.6.4 Impact Bonds

Impact bonds are debt instruments built upon pay-for-performance contracts. Investors pay a principal which is used as upfront capital by social sector actors to deliver a service or create an asset. Evaluators then assess whether the outcomes meet agreed-upon impact targets. If they do, then an outcome funder – typically a government – is obliged to pay the principal-plus-interest to the investors in accordance with an agreed payment mechanism. An intermediary organisation bridges the distance between these parties, tasked with structuring a deal between the outcome funder, investors, service providers and evaluators.

Social Impact Bonds (SIBs) have been trialled in a number of jurisdictions throughout the world, including New Zealand, which in 2017 launched the first SIB around mental health and employment outcomes. But an emerging category is Environmental Impact Bonds (EIBs). These instruments use the same structure, although to provide upfront capital for environmental interventions, particularly to avoid future costs from pollution or environmental degradation. For example, in September 2016,

DC Water issued the US's first ever EIB to finance the installation of “green infrastructure” in Washington D.C. in order to reduce storm water run-off, with impact targets focused on reductions of storm water volume. The investors were Goldman Sachs and the Calvert Foundation, an organisation with a strong impact investment mandate (see §6.2 for an adaptation of this model to the challenge of establishing permanent forest on erosion-prone marginal land in New Zealand).

By focusing on environmental measurement and impact, EIBs are arguably more robust and less controversial than social measurement and impact.⁶⁶ This is a critical advantage for building impact bond contracts. Indeed, in Europe, where SIBs are a familiar part of the investment landscape, there is diminishing confidence in SIBs due to (1) a lack of clear intervention logic in the social investment sector and (2) an opaque methodology for calculating the future avoided costs on a particular intervention on a social topic. Environmental impact investment is seen as a way to bypass some of the challenges of SIBs – especially controversies over identifying adequate metrics for impact – by focusing on relatively well-established forms of environmental measurement. Moreover, because positive environmental outcomes tend to also deliver positive social outcomes, there is a growing interest in *integrated impact*, where social and environmental outputs and outcomes are treated as intertwined (see §1.4).

4.6.5 Green Bonds: New Zealand versus Australia

To date, no labelled green bonds or certified climate bonds have been issued in New Zealand, either privately or publicly. As discussed below, the Mahinerangi and Tuararua Wind Farms were financed by green bond proceeds, but this 2015 certified climate bond was issued by ANZ in Australia, not New Zealand. Similarly, the Kauri bond recently issued in July 2017 by the International Finance Corporation (IFC) – while registered in New Zealand and New Zealand dollar-denominated – is foreign issued.⁶⁷ The use of proceeds will be entirely overseas, because the IFC does not lend to developed nations.

As specified in §4.6, there are hurdles to national issuance of green sovereign bonds, although these hurdles are less relevant for local government. City or regional councils could potentially issue green or climate bonds, especially those larger councils that can deliver impacts at scale. In regard to private issuance, no commercial banks in New Zealand have issued green or climate bonds, even though ANZ and Westpac have issued such bonds in Australia. The report's authors speculate that the key hurdles are (1) the challenges of scale and (2) the lack of an activated market or culture that is aware of their potential. It is possible that unlabelled climate-aligned bonds have been issued in New Zealand, although no bonds have been earmarked as such.

⁶⁶ David Hall (2017), “Greening the Future: a case for environmental impact bonds”, Policy Quarterly 13(2), pp.41–48.

⁶⁷ Gareth Vaughan (2017), “World Bank offshoot International Finance Corporation seeking at least NZ\$100 million through first green bond in NZ Kauri market”, <https://www.interest.co.nz>, 27 July 2017.

By contrast, Australia is developing a reputation as a world leader in climate bonds. In March 2017, Climate Bonds Initiative highlighted “Australia’s emergence as an example of international best practice... All four of Australia’s major banks have now issued Certified Climate Bonds, a status unmatched in any other advanced economy financial sector”. The statement goes on to commend the role of the Clean Energy Finance Corporation (CEFC), the Australian Government-owned green bank, in “supporting the establishment of the domestic market, having acted as a cornerstone investor for five of the 11 Australian climate bond issuances to date”.⁶⁸

Among these green bonds are an ever-expanding cohort of Certified Climate Bonds. Three of the “big four” major banks – NAB, ANZ and Westpac – have already issued climate bonds, with NAB being the first mover in December 2014. In May 2015, ANZ Bank issued a AUD\$650 million climate bond (certified for the Low Carbon Buildings, Wind, Solar Standards) which includes in its asset pool the Mahinerangi and Tuararua Wind Farms in New Zealand, as well as many more wind farms throughout Australia, Taiwan and the Philippines. At the time of writing, the full list of certified climate bond issuances in Australia include:

Amount (AUD)	Sector	Issuer	Date
\$300m	Solar & Wind	National Australia Bank	Dec, 2014
\$650m	Buildings, Wind, Solar	ANZ Bank	May, 2015
\$50m	Solar	Flexigroup	April, 2016
\$500m	Multisector	Westpac Bank	May, 2016
\$300m	Multisector	Treasury, Victoria	July, 2016
\$218m	Multisector	Monash University	Dec, 2016
\$265m	Solar	FlexiGroup	Feb, 2016
\$64.8m	Climate Bonds	Westpac Bank	Feb, 2017
Pre-issue	Solar & Transport	Treasury, Queensland	Feb, 2017

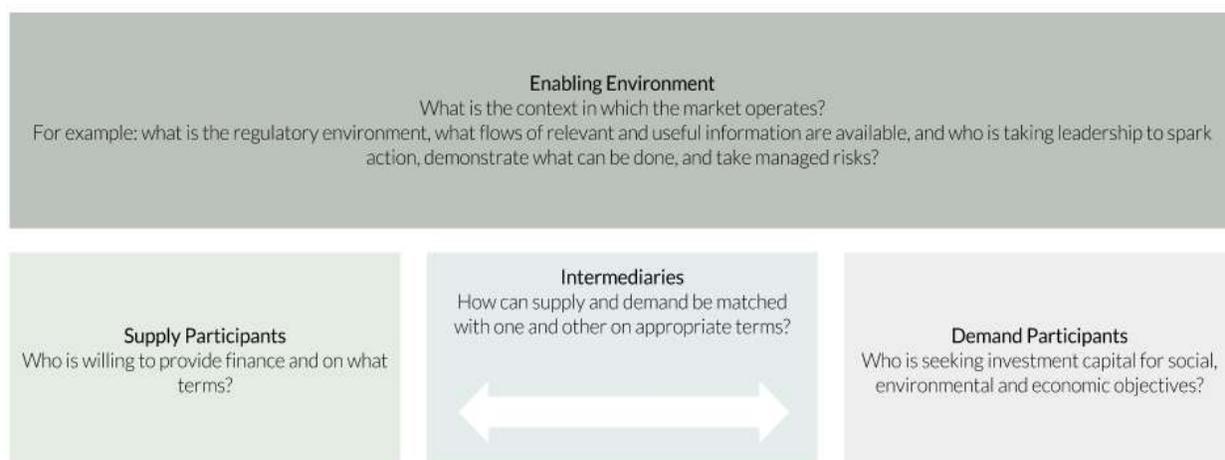
This means that for New Zealand-based or foreign investors, there are no green or climate bonds to invest in where proceeds are earmarked for activities that support the transition to a net-zero

⁶⁸ Sean Kidney (2017), “New CBA Climate Bond: AUD 650m: Australia bolsters international best practice status”, Retrieved on 29th March 2017 from the Climate Bonds Initiative blog.

carbon economy. If New Zealand-based investors did want exposure to these types of investments, one way is to invest in green or climate bonds issued in Australia or further afield. An indirect way to invest in New Zealand climate-aligned projects is to invest in the QuayStreet Balanced SRI Fund (SRI). This was launched in 2007, presently NZ\$32 million in net asset value. According to the SRI Fund's fact sheet, 24.3% is invested in Australian and New Zealand fixed income securities, including the 2015 ANZ AU\$650 million certified climate bond which includes Mahinerangi and Tuararua wind farms among its assets.

5. Recommendations

The following section identifies ten recommendations to create a more conducive enabling environment for well-aligned, purposeful, effective climate finance flows in New Zealand. An enabling environment can be defined as “a set of interrelated conditions – such as legal, bureaucratic, fiscal, informational, political, and cultural – that impact on the capacity of [actors] to engage in development processes in a sustained and effective manner.”⁶⁹ In regard to climate-aligned projects and activities, this is the overarching ecosystem in which the dynamics of supply and demand play out, and in which intermediaries operate to bridge financing gaps (see the diagram below).



Source: Adapted from J Freireich and K Fulton, *Investing for Social and Environmental Impact*, Monitor Institute, 2009; and R Hill, *Effective Consulting*, in collaboration with the Australian Government Department of Education, Employment and Workplace Relations

An effective enabling environment for climate finance is one that fulfils the four pillars of effective impact investment markets: (1) confident and informed demand; (2) efficient matching of supply and demand; (3) variety of investment mechanisms, and (4) resilient supply of finance.⁷⁰ As the OECD notes, “the public sector has a key role to play... [in] creating an enabling environment. A well-designed regulatory framework, information on climate risk and pricing externalities, and better aligned policies could help drive adequate investment” into climate-aligned projects and activities.⁷¹

The enabling factors discussed below are tailored to the specific circumstances of New Zealand. These factors exist on a continuum of relative ease – from low-hanging fruit, such as reporting

⁶⁹ Jeff Thindwa (2001), “Enabling environment for civil society in CDD projects”, World Bank Social Development Family, CDD Learning Module, Washington D.C.: World Bank.

⁷⁰ Paul Cheng (2011), *The Impact Investor's Handbook: Lessons from the World of Microfinance*, CAF Venturesome: Market Insight Series, February 2011, p.7.

⁷¹ OECD (2017), *Investing in Climate, Investing in Growth*, p.32.

requirements or identifying a pipeline of climate-aligned infrastructure projects; to more ambitious initiatives, such as green investment banks (see the table below). In their ways, all these enabling factors contribute to the dynamics that support effective and impactful investment – by increasing available information about climate-related investments and risks, by encouraging climate-aligned intentions and priorities among relevant actors, and by supporting intermediaries that might coordinate supply- and demand-side pressures.

5.1 Disclosure and Reporting

A low hanging fruit from a climate finance perspective is the introduction of requirements around climate-related disclosure and reporting among public and private entities. By creating an accessible record of climate-relevant investments, this increases the fidelity and availability of information about climate-related liabilities, thereby enabling financial markets to make more rational decisions regarding climate-related risks and opportunities.

Different reporting standards are appropriate for different situations. Among existing reporting regimes, there are the United National Principals of Responsible Investment (UNPRI), the Global Reporting Initiative (GRI) and Integrated Reporting (IR). In impact investment, the Impact Reporting Investment Standards (IRIS) and Global Impact Investment Ratings System (GIIRS) are established frameworks which are followed by a large majority of investors around the world. Even within specific instruments, such as certified climate bonds, transparency and disclosure are key requirements for certification under Climate Bonds Initiative Standards. To support international consistency and comparability, New Zealand can embed these international standards and best practice into investment decision-making, measurement and reporting.

A global reporting standard for companies has recently been proposed by the Task Force on Climate-Related Financial Disclosures (TCFD), chaired by former New York mayor, Michael Bloomberg. As the 2017 TCFD report notes: “One of the essential functions of financial markets is to price risk to support informed, efficient capital-allocation decisions.” This relies on “accurate and timely disclosure of current and past operating and financial results” and, following the Global Financial Crisis, “it is increasingly important to understand the governance and risk management context in which financial results are achieved.”⁷²

⁷² Task Force on Climate-Related Financial Disclosures (2017), Recommendations of the Task Force on Climate-Related Financial Disclosures, report prepared for Mark Carney, Chairman of the Financial Stability Board, pp.ii.

The TFCFD recommends the following disclosures:

Governance	Describe the board's oversight of climate-related risks and opportunities.
	Describe management's role in assessing and managing climate-related risks and opportunities.
Strategy	Describe the climate-related risks and opportunities the organisation has identified over the short, medium, and long term.
	Describe the impact of climate-related risks and opportunities on the organisation's businesses, strategy, and financial planning.
	Describe the resilience of the organisation's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.
Risk management	Describe the organisation's processes for identifying and assessing climate-related risks.
	Describe the organisation's processes for managing climate-related risks.
	Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organisation's overall risk management.
Metric and targets	Disclose the metrics used by the organisation to assess climate-related risks and opportunities in line with its strategy and risk management process.
	Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.
	Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.

5.2 Climate Finance Tracking

As discussed earlier (see §3.3), the tracking of global climate finance flows is a relatively new and evolving process, which currently involves competing methodologies and definitions, as well as major knowledge gaps (at least partly due to the lack of climate-related disclosures). Nevertheless, the New Zealand Government should remain up-to-date with international developments in climate finance tracking and endeavour to apply these methodologies domestically.

It must be emphasised that *full and comprehensive knowledge of current climate finance flows is not a precondition for more impactful climate investment*. That said, even a light-touch survey – such as the one provided by this report drawing predominantly from Climate Policy Initiative’s methodology – can be used to identify gaps, opportunities and baselines by which to track progress from. Furthermore, quantifying the volume of certain kinds of climate investment (such as the total value of green bonds outstanding) could create more specific baselines to measure year-by-year changes. The challenge is to gather enough information to make investment more strategic, yet without making information-gathering a substitute for action.

Moreover, enhancing transparency, comprehensiveness, and consistency in climate accounting, as well as building a consensus on what counts as climate finance, will strengthen trust and cooperation between public and private sector and international collaborators. The New Zealand Government could utilise and accelerate these tracking efforts by developing a *climate investment approach* – analogous to the *social investment approach* or combined as an *integrated investment approach* – which analyses climate finance information through a natural capital framework to inform the Government’s role as an investment manager of climate finance, while also allowing for scenario development, testing and sensitivity analysis. All of this information is critical for Government to weigh up the merits of an investment decision and track its performance against intended low emissions outcomes.

5.3 Climate-friendly Principles for Existing Institutions

This survey has identified a shortage of clear climate-aligned priorities and investment principles in the New Zealand financial landscape. Although climate-aligned investment occurs in spite of this, to launch a decisive transition, New Zealand could adapt the OECD’s recent recommendation: “Integrate the climate imperative into structural reform and broader national development strategies, reflecting the role of our physical environment as a fundamental pillar for strong, sustainable, balanced growth.”⁷³ This involves recommendations for structural reform policies to augment climate-aligned objectives, reassess and optimise national fiscal policies, and pursue a whole-of-government approach to low-emission, climate resilient growth.

One aspect of this is a greater uptake of climate finance principles among existing financial institutions whose role is to develop traditional investment opportunities in New Zealand. For example, Callaghan Innovation, whose role is to develop early-stage companies, does not identify climate change mitigation or adaptation innovations as a specific sector for incubation.

⁷³ OECD (2017), *Investing in Climate, Investing in Growth*, Paris: OECD, p.36.

Similarly, the New Zealand Venture Investment Fund (NZVIF) was established by the New Zealand government in 2002 to help build a vibrant early stage investment market in New Zealand. The NZVIF is the only Government-funded institutional investment program that is available for early-stage companies which are typically higher-risk and, therefore, potentially less attractive to private investors. NZVIF has NZ\$245 million of funds under management which are invested through two vehicles: the Venture Capital Fund and Seed Co-investment Fund.

A light-touch review of the 241 companies that NZVIF has invested in since 2002 reveals that approximately five companies might be considered low carbon investments. They are:

- *Anzode*, long life, rechargeable batteries: NZ\$2.4 million invested.
- *Arc Active*, lead acid batteries: NZ\$225,000 invested.
- *Hydro Works*, hydropower turbines: Unknown.
- *Yike Bike*, lightweight, folding electric bikes: NZ\$8.5 million invested.
- *Solar Bright*, solar and LED lighting: NZ\$1.5 million was invested.

This could be explained by NZVIF policy to not prefer any investment sectors over others. Instead, potential investee companies are promoted to NZVIF by the partner fund or angel network for co-investment consideration. Partner funds or angel networks are most likely to promote companies that have sector expertise, or which can add value to the investee company. A review of the partner funds' portfolios and investment criteria reveals that just one fund, GRC SinoGreen, indicates climate change-related investments as a sector of interest. Furthermore, of the 14 angel networks reviewed, only Powerhouse Ventures lists clean technology and environment as sectors of interest.

The investment policies of these (and other) financial institutions could be updated to identify low-emissions investments as a sector of interest in line with national interests. The institutions could allocate funding and expertise to specifically address the finance needs of this sector. In doing so, they would likely act as a positive catalyst for growth in climate-aligned finance, as they have done for traditional investment opportunities over the preceding years.

5.4 Pipeline of Climate-aligned Projects

Developing a transparent pipeline of infrastructure projects is recognised as an important enabling factor by G20 leaders for facilitating global investment and infrastructure development.⁷⁴ To create a pipeline of “bankable” or investable projects in the short-, mid- and long-term enables coordination, information gathering, problem solving, and a capacity for pre-emptive planning. It can also overcome silo-isation, where only particular agencies have knowledge of plans for specific

⁷⁴ OECD (2017), *Investing in Climate, Investing in Growth*, Paris: OECD, p.29.

infrastructure and its consistency with sustainable and climate-aligned development objectives. Cross-sectoral transparency also helps to gain the confidence of private sector partners; in this sense, it involves extending the practice of disclosure and reporting for current assets to future assets also. Finally, devising a pipeline creates an opportunity to analyse infrastructure projects in light of international obligations and expectations under the Paris Agreement, to assess whether projects align or misalign with emissions reductions objectives and revise infrastructure projects accordingly, or to reassess infrastructure projects in light of revised emissions targets and safe pathways.

5.5 Structural Realignment to Climate Objectives

It is not only necessary to implement new policies that are proactively enabling, but also to diagnose and reform policies that are *disabling*, that undermine an enabling environment for climate finance. For example, while a carbon price creates an appropriate signal for climate-aligned market decisions (see §5.10), the existence of subsidies or grants for high-emissions activities has an implicit dampening or repressive effect on this carbon price. Another example is the misalignment of long-term infrastructure plans with the commitments made in the Paris Agreement, which risks that these assets become “economically stranded when policy constraints finally catch up”, requiring expensive upgrades or write-offs.⁷⁵

Accordingly, the OECD notes that “governments should undertake an inventory of policies that explicitly and implicitly price carbon, and assess the impact of the policies and their interactions in order to ensure that they are mutually supportive in achieving CO₂ reductions as well as other social and economic objectives.”⁷⁶ These could include “regulatory regimes for infrastructure that deter investment in resilience; planning policies that encourage development in vulnerable areas; and under-pricing of natural resources.”⁷⁷ At the national level, *whole-of-government approaches* are recommended to develop a holistic, systemic perspective that can diagnose how different parts of a regulatory framework are interacting, especially when those interactions are misaligned or produce perverse incentives/ The objective, more broadly, is to work towards “a more climate consistent global financial system by assessing and addressing possible misalignments within financial regulations and practices.”⁷⁸

⁷⁵ OECD (2015), *Aligning Policies for a Low-Carbon Economy*, Paris: OECD Publishing, p.110.

⁷⁶ OECD (2013), “Climate and Carbon: Aligning prices and policies”, *OECD Environment Policy Papers*, No. 1, Paris: OECD Publishing.

⁷⁷ OECD (2015), *Aligning Policies for a Low-Carbon Economy*, p.144.

⁷⁸ *Ibid.*, p.37.

5.6 Climate Change Leadership

To initiate change, leadership is required. It is required, in part, because the transition to a low-emissions economy involves a major shift away from the status quo, which is perceived as threatening to many. Leadership is also needed to break out of path-dependencies and to drive action under conditions of uncertainty – that is, when science and economics cannot determine which policy option to choose.⁷⁹

Bateman and Mann argue that, when addressing complex issues such as climate change, there are a variety of relevant leadership functions. These include “administering (classic top-down leadership), enabling (clearing the path for others to drive productive change) and adapting to changing environments.” The last attribute, *adaptive leadership*, is driven by a leader or leadership team’s capacity to think strategically and drive knowledge and innovation by recognising “its significance (the potential usefulness of new, creative knowledge or adaptive ideas) and its impact (the extent to which other agents embrace and use the new knowledge or idea).”⁸⁰

Internationally, climate leadership has emerged across a range of domains. “Acts of climate leadership are everywhere” – at the global organisational level, the national or local level, the governmental and non-governmental.⁸¹ Moreover, there is support for leadership, declarations that create an enabling environment for leaders to lead; such as the 2014 Global Investor Statement which stated: “Stronger political leadership and more ambitious policies are needed in order for us to scale up our investments. We believe that well designed and implemented policies would encourage us to invest significantly more in areas such as renewable energy, energy efficiency, sustainable land use and climate resilient development, thereby benefitting our clients and beneficiaries, and society as a whole.”⁸²

In New Zealand, examples of leadership (or willingness to lead) have emerged at all these levels. Government examples include New Zealand’s leading role in the Global Research Alliance on Agricultural Greenhouse Gases; the GLOBE-NZ cross-party working group on climate change; and local government participation in international networks such as Local Government NZ’s commitment to the Global Covenant for Mayors for Climate and Energy, or Wellington and Christchurch’s membership in the Rockefeller Foundation’s 100 Resilient Cities Network. Various businesses are committing to climate-aligned activities, or endorsing systemic change to the

⁷⁹ Silvio Funtowicz and Jerome R. Ravetz (1993), *Futures* 25, pp.739–755; Roger Pielke Jr. & Daniel Sarewitz (2002). “Wanted: Scientific leadership on climate.” *Issues in Science and Technology*, 19(2), 27-30.

⁸⁰ Thomas S. Bateman and Michael E. Mann (2016), “The Supply of Climate Leaders Must Grow”, *Nature Climate Change*, 6, pp. 1052-1054.

⁸¹ Bateman et al. (2016), “The Supply of Climate Leaders Must Grow”.

⁸² Asia Investor Group on Climate Change, Investor Group on Climate Change, Institutional Investors Group on Climate Change, Investor Network on Climate Risk, United Nations’ Principles for Responsible Investment Initiative, & United Nations Environment Programme’s Finance Initiative (2016), “Global Investor Statement on Climate Change”.

regulatory ecosystem to align with low-emissions outcomes, either independently or through representative organisations such as the Sustainable Business Council and the Sustainable Business Network. In the philanthropic sector, The Tindall Foundation, the NEXT Foundation, Foundation North and others are engaging in climate-aligned investment and funding. Currently, a number of social sector parties are working towards a national advisory board on impact investment which coordinates activities in relation to government, particularly with the new Social Investment Unit, as well as international initiatives. Other parties operating within the social sector, such as Generation Zero and Pure Advantage, create public acceptance of climate action, not least by socialising potential solutions.

There are opportunities for governments to exercise leadership in all these functions: to administer a regulatory system that is conducive to broad social orientation around climate-aligned activities; and to encourage an enabling environment inside and outside of government that highlights, coalesces, and empowers climate leadership across a range of sectors. There are also opportunities to enhance adaptive leadership, especially by forging a whole-of-government approach throughout central and local government that coordinates and exploits the synergies among workstreams, which in the New Zealand context include the Emissions Trading Scheme Review; the Reference Groups on biological emissions and forestry; the Adaptation Technical Working Group; and various climate-aligned projects and programmes within sector agencies and local councils.

5.7 Alternative Organisational Forms

Amendments could be made to the Companies Act 1993 that recognises and supports businesses – such as social enterprises – that wish to take an integrated approach to business, particularly with climate-aligned activities.

Organisations in New Zealand who wish to create social and/or environmental value have two options to consider when formalising their legal structure: *non-profit* (i.e. charitable trusts, incorporated societies) and *for-profit* (i.e. sole trader, partnership, limited liability companies). For-profit business which intend to create social and/or environmental value, in addition to financial return, are commonly known as an *impact enterprise* or *social enterprise*. However, there does not yet exist legal structures that adequately acknowledges this unique organisational purpose (although the Department of Internal Affairs is currently reviewing policy in this area).

Since 2008, several states in the US have enacted alternative organisational forms intended to promote and facilitate businesses that wish to pursue financial profit and social and/or environmental mission simultaneously.

- **A low-profit limited liability company (L3C)** is a LLC variant enacted in 9 states. An L3C is a for-profit, impact enterprise venture that has a stated goal of performing a socially beneficial purpose, not maximising income.
- **The Benefit Corporation** has been enacted in over thirty states. To be granted and to preserve certification, companies must receive a minimum score on an online assessment for "social and environmental performance", satisfy the requirement that the company integrate commitments to stakeholders into company's governing documents. Note, a Benefit Corporation is not the same as a "Certified B Corporation", which is a designation that the business meets various social and environmental standards, regardless of its organisational form. There are currently four examples of "Certified B Corporations" in New Zealand.
- **A flexible purpose corporation or Social Purpose Corporation (SPC)** was established in 2012 in California, USA. It enables corporations to consider social or environmental issues in decision making instead of relying only on profit-maximising goals.
- In the United Kingdom, there exists a **Community Interest Company (CIC)** designed for impact enterprises that want to use their profits and assets for the public good. It is designed for business with primarily social objectives whose surpluses are principally reinvested for that purpose in the business or in the community, rather than being driven by the need to maximise profit for shareholders and owners.

5.8 Project-oriented Intermediaries

A financial intermediary is an institution or individual that acts as the go-between between two or more parties in a financial transaction, that mediates between the supply and demand side for climate-aligned projects and activities. An important role for intermediaries is to provide access to finance for businesses or social sector organisations whose activities create measurable climate mitigation and adaptation outcomes. Ideally, intermediaries would unlock loans, equity, guarantees or other financial instruments to crowd-in public and private funding that can be reinvested over multiple cycles, rather than one-off payments such as grants.

Because much climate finance involves familiar and simple finance instruments, such as loans or grants, the intermediaries will often be familiar entities, such as commercial banks or philanthropic organisations. For more novel instruments, such as those discussed in Section 6, it will be necessary to establish new intermediaries that have the necessary capacities, potentially composite entities that introduce the necessary financial, legal, actuarial and sectoral expertise. For example, the Permanent Forest Bond could utilise a forestry company to leverage its expertise and networks, as

well as representatives from banks and accounting firms. Similarly, the Low Emissions Accelerator Fund would benefit from a close working relationship with EECA, to leverage its expertise and connections in this area. However, an alternative arrangement is to use a green investment fund as a single intermediary for multiple instruments (see §5.9).

5.9 Green Investment Fund

A potential strategy for accelerating climate investment is establishing a green investment fund that serves as a hub for investment activity and climate finance expertise. Although this would be a substantial undertaking, it is argued that it could plausibly be faster and easier to establish a new institution with a climate-aligned mandate than to achieve internal reform across multiple existing institutions.⁸³ It could also serve as a single intermediary for climate-aligned projects, leveraging its expertise and scale to assess initiate projects like those discussed in Section 6.

Green banks already exist in a number of advanced economies and some emerging economies – at the national level (Australia’s Clean Energy Finance Corporation, Japan’s Green Fund, Malaysian Green Technology Corporation, Technology Fund Switzerland and the UK Green Investment Bank), in several US states (California, Connecticut, Hawaii, New Jersey, New York and Rhode Island), and in one city (Masdar, United Arab Emirates). The national green investment banks were all initially financed through public funds by national governments – although the UK Green Investment Bank alone has since been sold to Australian bank Macquarie.

These green investment banks boast a strong record. For example, the Clean Energy Finance Corporation (CEFC), the green investment bank established in Australia in 2012, has achieved a 4.15% return (net of operating costs) which exceeded the portfolio benchmark return of 3.14%. Green banks have also succeeded in leveraging large amounts of private investment. For example, for every US\$1 it has invested to date, the UK Green Investment Bank has mobilised an estimated US\$3 of private capital.⁸⁴ This aligns with the principle that public finance drives private investment.

The idea of a green investment bank in New Zealand has been floated before. In October 2015, Anthony Healy, CEO of BNZ, told the Australia-New Zealand Climate Change and Business Conference how customers at the National Australia Bank (NAB) could draw concessional low-cost debt for energy efficiency and renewable energy from the Clean Energy Finance Corporation (CEFC), a green investment bank established in Australia in 2012: “This is a great example of a creative solution – an innovative partnership with government to deliver an environmental outcome

⁸³ New Climate Economy: The Global Commission on the Economy and Climate (2016), *The Sustainable Infrastructure Imperative, Financing for Better Growth and Development: The 2016 New Climate Economy Report*, p.56.

⁸⁴ The New Climate Economy website (2017). Retrieved July 2017 from <http://newclimateeconomy.report/2016/transforming-the-financial-system/>

and a great deal for NAB customers. And potentially it's an idea that could be applied here in New Zealand, too.”⁸⁵

Ultimately, there is judgment required as to whether a green investment bank is appropriate. It is an elaborate undertaking and climate finance obviously can exist without one. There are also questions as to whether New Zealand can sustain a pipeline of projects that are sufficient, or whether the transformation of existing institutions (see §5.4) is a preferable outcome. On the positive side, in addition to their potential profitability, the OECD notes that green investment banks benefit from a specific mandate to overcome infrastructure investment barriers and local market failures, build confidence by reducing risk and demonstrating profitability in green investments, grow expertise by hiring local financial specialists, transform markets by pioneering and pathbreaking new investments, and reduce information costs for other investors.⁸⁶

5.10 Carbon Pricing

The existence of a reliable carbon price is widely observed as a precondition for the transition to net-zero economies, both globally and nationally.⁸⁷ The OECD remarks: “A robust price on GHG emissions with long-term credibility is a central pillar of any low-carbon economy, providing incentives for immediate emissions reductions where possible, as well as investment and innovation in low-GHG technologies.”⁸⁸ A recent policy report for G20 Finance Ministers recommended that carbon pricing systems be assessed and peer reviewed for their adequacy to fulfil Paris Agreement targets, as well as developing carbon pricing roadmaps that credibly deliver those targets.⁸⁹ Similarly the OECD recently observed that a carbon price can provide “a powerful, cost-effective tool for steering producers and households towards low-carbon and growth-oriented behaviour and investments” – but warns that carbon prices internationally have been weakened by transitional measures and by fossil fuel subsidies which “act as negative carbon price signals”.⁹⁰

This is not only an issue for governments but also for businesses, many of which are beginning to adopt internal carbon prices to inform their own climate strategies. A 2016 Carbon Disclosure

⁸⁵ The Bank of New Zealand website (2017). Retrieved June 2017 from <https://www.bnz.co.nz/about-us/media/2015/climate-change-whats-a-bank-got-to-do-with-it>

⁸⁶ OECD (2015), “Green Investment Banks”, OECD Policy Perspectives, Paris: OECD Publishing, p.12.

⁸⁷ For example, see World Bank (2015), *The FASTER principles for successful carbon pricing : an approach based on initial experience*, Washington, D.C.: World Bank Group; World Bank, Ecofys & Vivid Economics (2016), *State and Trends of Carbon Pricing 2016*, Washington, DC: World Bank; OECD, IEA, NEA & ITF (2015), *Aligning Policies for a Low-carbon Economy*, OECD Publishing, Paris.

⁸⁸ OECD (2015), *Aligning Policies for a Low-Carbon Economy*, Paris: OECD Publishing, p.29.

⁸⁹ Celine Bak, Amar Bhattacharya, Ottmar Edenhofer and Brigitte Knopf (2017), “Toward a comprehensive approach to climate policy, sustainable infrastructure, and finance”, G20 Insights: Co-Chair Brief, Climate Policy and Finance Taskforce, p.10.

⁹⁰ OECD (2017), *Investing in Climate, Investing in Growth*, Paris: OECD, p.31.

Project (CDP) report found that more than 1,200 companies are currently using an internal carbon price (or are planning to within two years), with an increase of 23 per cent over last year.⁹¹ However, there are a range of methods for determining these prices, which partly reflects the fact that there are different kinds of carbon price with different functions:

- **Market price of carbon.** This refers to the actual spot price for one tonne of carbon dioxide equivalents (CO₂-e) on relevant carbon markets. The current price for New Zealand Units (NZUs) is \$16–18.
- **Projected price of carbon.** This is the future carbon price that is anticipated by governments or other organisations, to be used for future-oriented cost-benefit analysis. It is a projection, however, not a prescription, without any commitment to imposing such a price in future. Currently, New Zealand ministries have the discretion to make their own projections. For example, MfE has used a carbon price of NZ\$25 in 2021, rising to NZ\$50 by 2030, for its cost analysis of the 2030 target.⁹² By contrast, MBIE recently used for its projections a 2030 price of between \$56–\$152—that is, \$152 per tonne assuming a global low-carbon transition, or \$104 per tonne assuming domestic transition to renewable energy and EV uptake, or \$56 per tonne assuming Tiwai Point shutdown.⁹³
- **Social cost of carbon.** This refers to a carbon price that aims to reflect, in monetary terms, all the quantifiable costs and benefits of one tonne of emitted CO₂. These are typically calculated using *integrated assessment models*; the best known are DICE, FUND and PAGE. For example, a recent DICE analysis by Stern and Dietz estimated that, depending on the scale of damage anticipated, the carbon price should be US\$32–103 per tonne (NZ\$41–131) and should rise to NZ\$82–260 by 2035 (NZ\$104–331) to avoid warming of more than two degrees above pre-industrial levels.⁹⁴ Since 2010, the United States Government has used a social cost of carbon for its policy appraisals, which in 2017 is US\$39 per tonne. Canada has also recently adopted this approach.
- **Behavioural carbon prices.** This refers to the carbon price that is needed to influence behaviour, by providing an actual incentive or disincentive for emissions-relevant activities. For example, in New Zealand, a 2014 survey of ETS participants found that, among emitters,

⁹¹ Carbon Disclosure Project (2016), “Embedding a carbon price into business strategy”, CDP North America Inc, p.3.

⁹² Office of the Minister for Climate Change Issues (2016), “New Zealand’s intended contribution to the new global climate change agreement.” Paper to the Cabinet Economic Growth and Infrastructure Committee, Wellington N.Z..

⁹³ Ministry of Business, Innovation & Employment (2016), “Electricity Demands and Generation Scenarios: Scenarios and Results Summary”, Wellington N.Z.; derived from International Energy Agency (2015), *Energy and Climate Change: World Energy Outlook Special Report*, Paris: IEA.

⁹⁴ Nicholas Stern and Simon Dietz (2014), “Endogenous Growth, Convexity of Damages and Climate Risk: How Nordhaus’ Framework Supports Deep Cuts in Carbon Emissions”, Working Paper (Leeds, UK; London; UK: Centre for Climate Change Economics and Policy & Grantham Research Institute on Climate Change and the Environment, p.22.

“Of those who could reduce emissions, the majority indicated that they would seek to do so if the price stayed above NZ\$20 (24%) or NZ\$25 (28%).”⁹⁵

- **Target-consistent carbon prices.** This is a behavioural carbon price that is linked to a specific emissions reduction target, such that economic modelling anticipates that this carbon price will reduce overall emissions accordingly. The UK, for example, determines a target-consistent carbon price that aligns with its carbon budget setting process by the Committee on Climate Change. The EU has also switched to this approach, formerly relying on a social cost of carbon.

Each of these carbon prices can play different roles and express different kinds of value. A review of OECD and EU nations found wide variation in approaches to carbon price and the level of carbon valuation.⁹⁶ Indeed, many countries have a mixture of these approaches, combining social cost estimates with market pricing through emissions trading, as well as target-consistent pricing. It is also worth noting that these actual or mandated carbon prices are distorted by wider features of the economic environment; for example, subsidies on fossil fuels or high-emissions activities effectively distorts and dilutes a carbon price, making a real carbon price less effective than it would otherwise be. Ideally, a carbon price should be transparent in its methodology, consistent among government and private-sector organisations, and predictable over time to enhance investor certainty.

⁹⁵ Jessika Luth Richter and Lizzie Chambers (2014). “Reflections and Outlook for the New Zealand ETS”, *Policy Quarterly*, 10(2), p.61.

⁹⁶ Stephen Smith and Nils Axel Braathen (2015), “Monetary Carbon Values in Policy Appraisal: An Overview of Current Practice and Key Issues”, OECD Environment Working Papers, No. 92, OECD Publishing, Paris.

6. New Zealand Instrument Examples

The examples below illustrate potential financial instruments that could reduce private investors' risks and improve their financial returns in an effort to address the adaptation and mitigation needs of New Zealand. These proposals are not definitive, nor the only possible instrument which could be applied in each sector. These instruments are discussed in order to illuminate the kinds of innovations that the New Zealand Government could pursue, and which reflect the particular challenges that New Zealand faces in fulfilling its international obligations and expectations.

6.1 Low Emissions Accelerator Fund (LEAF)

The Low Emissions Accelerator Fund (LEAF) is a green investment fund which increases the supply of risk capital (equity) for energy efficiency and fuel-switching initiatives. By crowding-in new investors through de-risking investments, LEAF could precipitate a “culture change” by accelerating climate-aligned investment in New Zealand.

LEAF's strategy for use-of-proceeds is two-tiered investment fund, addressing both supply and demand for climate-aligned technologies by (1) investing directly into companies that provide energy efficiency and fuel-switching outcomes; and (2) providing equity and/or debt financing to facilitate the uptake of energy efficiency and fuel-switching projects. Energy savings that result from project implementation create “project revenue” to be allocated between the different actors in line with contractual provisions. LEAF is adapted from the proposed Energy Efficiency Enabling Initiative, designed by The Global Innovative Lab for Climate Finance (the Climate Finance Lab), a climate finance research group funded by the UK, USA, Germany and Netherlands governments and private funders (Rockefeller Foundation and Bloomberg Philanthropies).⁹⁷

Presently, the majority of energy efficiency investments in New Zealand are self-financed by end users, albeit with selective and partial support from grants and debt provision (see especially §4.1.1). LEAF provides an equity dimension to create the capacity to expand and upscale companies that produce low-emissions technologies. This equity dimension is often overlooked in traditional policy making, which tends to focus on government's role as *direct investor* through grant funding. LEAF is an investment fund that enables government to strengthen its *investment manager* role by creating the conditions for growth and expansion for climate-aligned companies, as well as a *market maker* role by providing strategic financing solutions to overcome hurdles to technology uptake (see §1.3). Initial public funds would be used to de-risk and demonstrate the value of climate-aligned ventures,

⁹⁷ Valerio Micale, Karoline Hallmeyer and Jessica Williams (2016), “Energy Efficiency Enabling Initiative: Lab Instrument Analysis”, San Francisco: Global Innovation Lab for Climate Finance.

thereby crowding in private investment and precipitating a “culture change” that accelerates green investment in New Zealand.

LEAF would be a hybrid-equity instrument (as opposed to a debt instrument such as the Permanent Forest Bond examined below). In the New Zealand context, LEAF would increase the supply of risk capital to a range of energy efficient companies and projects. It would do this by using donor-backed concessional equity capital to reduce the risk profile of energy efficiency investments at the fund level by offering priority distributions to private investors.⁹⁸ The fund would have a specific New Zealand-focused investment mandate to source and support energy efficiency initiatives with demonstrable reductions of greenhouse gas emissions; and to follow clear guidelines, investment eligibility criteria, and impact investment reporting standards.

The fund is primarily a supply-side intervention that aims to mobilise private investors – including institutional investors – as equity partners in LEAF, and/or as equity and debt providers in the project-level investments. A fully invested fund would generate attractive energy savings for end-users and corresponding CO₂ abatement each year. The Lab analysis shows that a US\$100 million fund could generate 200–225 GWh of annual savings, corresponding to 20,000–100,000 tonnes of CO₂ abated every year. When fully invested, LEAF would also help end-users save around US\$30 million in energy bills every year.

However, the secondary role of LEAF would be to overcome various demand-side challenges faced by energy efficiency objectives in New Zealand. First, because of New Zealand’s small scale, there are a diverse array of energy efficiency and fuel switching challenges but not large backlogs of identical challenges that can be solved by a single policy intervention; thus, a fund that aggregates diverse opportunities into risk-rated and investable tranches creates a more manageable and attractive offering to investors. Second, many energy efficiency and fuel switching investments are primarily self-financed by end-users (i.e. households, SMEs) which makes it difficult to scale up demand for providers of energy efficiency and fuel switching solutions, at least not without access to debt or equity. This is especially true for cash-constrained entities such as schools, households or farms which have a limited ability to service large amounts of debt for energy efficient projects. Accordingly, LEAF can help to build markets, to foster demand, by providing third-party equity

⁹⁸ An example of a tiered-risk capital structure is the Seychelles Conservation and Climate Adaptation Trust. The Trust will initially restructure US\$21.6 million of the Seychelles’ national debt in exchange for directing capital to environmental conservation initiatives. The Leonardo DiCaprio Foundation and others contributed US\$5 million in grants, and NatureVest, the investment arm of The Nature Conservancy, provided a US\$15.2 million loan. The Trust will ultimately direct approximately US\$5.6 million to climate-adaptation and marine-conservation activities as well as capitalise an endowment with US\$3 million over 20 years. It will eventually protect a marine area roughly the size of Germany, resulting in the Indian Ocean’s second largest marine reserve.

financing which, at a global level, currently only plays a marginal role for financing energy efficiency.⁹⁹

In terms of design, the Climate Finance Lab suggests that the initial formation of LEAF would be designed and operationalised largely with public grant resources, which would lower the cost for the private sector. The grant would be spent on establishing the implementing agency and the identification of investment opportunities which would fit LEAF's mandate. In terms of core structure, LEAF would have the following attributes:

- Public finance equity – for example, 30–40% – could mobilise private investors while preserving incentives for the fund manager to operate in a commercially sound manner. Private investors would see a “preferred return” payment structure with donors holding equity in a first-loss position. Examples from existing clean energy funds suggest that the annual rate could be set between 5–10%.¹⁰⁰
- A guaranteed-risk facility to be provided on each individual investment case to protect the private investors and incentivise investments that have attractive energy savings potential but would otherwise be deemed too risky for standalone investment.
- A technical assistance package to support investee companies in their mission execution as well as promote best practice and key learning opportunities.

Key stakeholders: The fund manager, donors, private equity investors, energy efficient companies, technology providers and traditional finance institutions. In terms of private equity investors, the fund would specifically target institutional investors (whose appetite for energy efficiency investment remains modest) with public-private partnerships often necessary to trigger investment. Other potential private investors include infrastructure funds, and corporate investors. LEAF would likely be institutionally aligned with EECA (Energy Efficiency and Conservation Authority), either situated within or alongside, to complement and extend EECA's existing knowledge of the energy market. LEAF could also draw on EECA and MBIE's institutional knowledge to inform its approach, design and so on; as well as work with relevant industry associations – such as the Energy Management Association of New Zealand (EMANZ) – to identify investment opportunities.

Impact investment focus: The fund would invest in companies and technologies that ensure a specific environmental target (e.g. 20% energy savings) and might include heat and power cogeneration; building management systems; heating, ventilation and air conditioning; lighting

⁹⁹ The Lab also found that public equity investment in energy efficiency is a relatively small share (1.5-2.0%) of total development finance flowing in the sector. See Micale et al. (2016), “Energy Efficiency Enabling Initiative: Lab Instrument Analysis”, p.12.

¹⁰⁰ Micale et al. (2016), “Energy Efficiency Enabling Initiative: Lab Instrument Analysis”, p.2.

improvements; waste heat recovery; boiler upgrades; and smart grids. The fund would invest via Special Purpose Vehicles (SPVs) specific to the contract type and investment structure associated to each investee company.

Potential investors: These include New Zealand Venture Investment Fund (NZVIF) members, philanthropic organisations, impact investors, private investors (e.g. high net worth individuals), family offices and so on. Donors from the public sector will have the option to enter the fund: (1) as equity investors, (2) providing grants to support the technical assistance facility; or (3) providing financing for the guarantee facility.

Fund Details	Specifics
Target Size	NZ\$100 million
Fund Manager	To be confirmed
Term	5-year investment period; total investment term of 12 years
Subscription Size	Minimum NZ\$1.0 million
Indicative Returns	10-15% net IRR
Management Fee	2% if the Fund capitalisation is NZ\$100 million ¹⁰¹
Distribution of Profits (Waterfall)	Distribution of returns from the fund to different investor classes until the end of the fund period. The first group includes private investors, investing 70% of capital in the fund and benefiting of a 10% preferred annual repayment hurdle. The second group includes public investors, committing 30% of finance to the fund's equity. 20% of revenues are also distributed to the general partner according to the performance of the fund after repayment of the hurdle rate for the investors. Base case scenario allows for an expected return of 15% for investors.

The table below is a hypothetical pipeline of projects that demonstrate what an invested pipeline could look like. *These are illustrative only.* The LEAF proposal would also include a capacity-building component to develop opportunities which are not yet investable but had merit based on climate-aligned potential.

¹⁰¹ The Lab assumes a 2% management fee for a US\$100 million fund. The distribution will be: total salaries US\$1.4 million; technical and Due diligence US\$300,000; travel budget US\$100,000; administrative US\$50,000; marketing and events US\$50,000; accounting, legal, other US\$100,000. See Micale et al. (2016), "Energy Efficiency Enabling Initiative: Lab Instrument Analysis", p.11.

Location	Company Name	Technology	Investment
Canterbury	Company 1	0.3 MW to 1 MW biomass conversion	\$3,000,000
Waikato	Company 2	Energy optimization & monitoring	\$2,700,000
Auckland	Company 3	Landfill gas to pipeline, bio-digestion	\$5,800,000
Waikato	Company 4	Energy efficient milk chillers	\$3,500,000
Wellington	Company 5	Vapour recompression devices	\$1,600,000
Nelson	Company 6	Electrical heating (heat pump)	\$2,900,000
North Auckland	Company 7	Rooftop Solar, LED street lights	\$4,000,000

The LEAF proposal is one potential structure to encourage growth in the energy efficiency sector. However, there needs to be further research into the fund's ability to generate sufficient returns to ensure private sector interest. This is because the energy efficiency market in New Zealand is relatively small and highly fragmented, meaning that it is difficult to achieve significant scale in the uptake of technological innovations. Investee companies face challenges to growth which might not always be solved by access to funding. Moreover, in a market where renewable energy already constitutes a high proportion of available electricity, it is more difficult to use the standard incentive frameworks around carbon pricing.

6.2 Permanent Forest Bond (PFB)

The proposed Permanent Forest Bond is a debt instrument which provides upfront capital for forest establishment, issued by a non-sovereign intermediary. The objective is to provide a scalable financial instrument that enables landowners to create carbon sinks that reduce New Zealand's net greenhouse gas emissions.

From a Crown perspective, its principal economic benefit is to reduce forward liabilities by reducing the number of foreign carbon offsets it needs to purchase to meet New Zealand's emissions targets. However, the forest established through the Permanent Forest Bond may create a further set of social, environmental and economic co-benefits which produce additional benefits – both quantifiable and unquantifiable – for landowners and regional communities. These co-benefits are not *unique* to the Permanent Forest Bond – commercial forests also provide a range of ecosystem services¹⁰² – but these co-benefits can be maximised according to how the bond is designed and how the investment is targeted.

Outcome Stack	Specific Outcomes
Primary Outcomes	Forest area (hectares of ETS eligible forest)
	Number of trees (stems per hectare)
	Volume of carbon (tonnes of carbon per hectare)
Environmental Co-benefits	Avoided soil loss
	Reduced sediment in waterways
	Avoided costs to private and public property from landslides
	Increased biodiversity
Social Co-benefits	Providing regional job opportunities
	Support for mana whenua to restore mauri of eroding land

¹⁰² Richard Yao et al., (2013), "Planted Forests", in *Ecosystem Services in New Zealand* (John Dymond, ed.), Lincoln, NZ: Manaaki Whenua Press, pp.62–78.

New Zealand is unusual among developed countries in having a large “land bank” available for future forest which is (1) highly or moderately prone to erosion; and/or (2) marginal or minimally productive for agriculture. MPI estimates that 1.1 million hectares of land is at serious risk of erosion and would benefit from afforestation and reforestation.¹⁰³

However existing schemes such as the Afforestation Grant Scheme (15,000-hectare target between 2015 and 2020) and the Permanent Forest Sink Initiative (15,900 hectares registered since 2006)¹⁰⁴ do not yet reach the scale of the problem identified. The Emissions Trading Scheme is designed to incentivise afforestation, but only 8% (around 25,000 hectares) of the 300,000 hectares registered in the ETS is native forest, and only 500 hectares of this native forest was established since 2008.¹⁰⁵ Moreover, commercial forestry will not bridge the gap, because much of this steep and remote land is marginal for production forestry as well as agriculture, due to the additional transport costs and logistical challenges of removing timber. Given this land’s limited productive potential, as well as the environmental costs of being unforested, permanent forest is a sound land use choice.

Permanent forest at this scale would make a substantial contribution to reducing net greenhouse gas emissions. Trotter et al. (2005) estimated that 1.45 million hectares of land is available that, if reverted to mānuka and kānuka, would sequester about 10.6 million tonnes of CO₂-e annually.¹⁰⁶ It would also accrue a range of environmental co-benefits including avoided soil loss, reduced sediment in waterways, avoided costs to private and public property from landslides, enhanced land resilience against extreme weather events, and increased biodiversity. It would also produce a range of social co-benefits by providing regional job opportunities, and support for mana whenua to restore mauri to deforested landscapes.

In recognition of this rich value-stack of environmental and social benefits, the proposed Permanent Forest Bond is best categorised as an Integrated Impact Bond (see §4.6.4). The impact bond structure was first trialled for Social Impact Bonds (SIBs), then adapted into environmental policy by David Nicola (2013) who describes an Environmental Impact Bond as:

¹⁰³ Other studies have landed on alternative estimates. For example, Shepherd et al found that 1.55 million hectares of land is potentially available for indigenous reversion. See Shepherd et al. (2008), “Nature and scale of eligible post-1989 non-planted forests.” Landcare Research Contract Report. Report prepared for Ministry of Agriculture and Forestry.

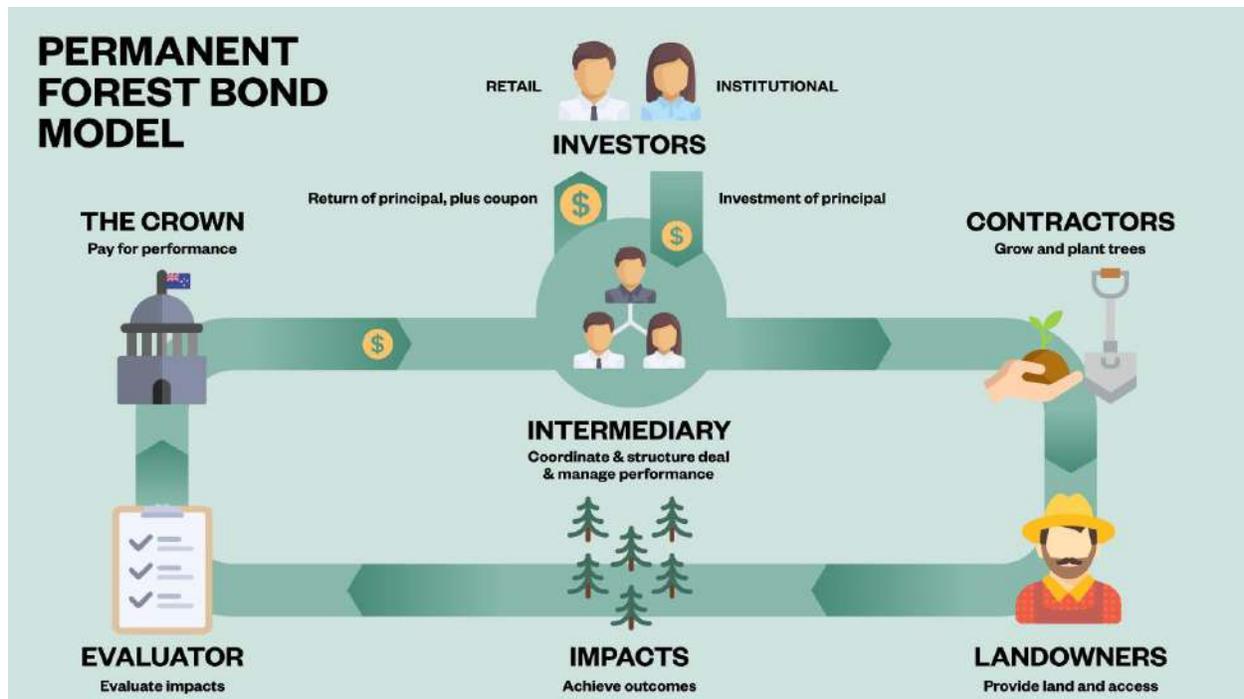
¹⁰⁴ Ministry for Primary Industries (2015), “The Permanent Forest Sink Initiative: Proposals for Improvement”, MPI Discussion Paper 2015/16, Wellington, NZ: Ministry for Primary Industries, p.8.

¹⁰⁵ Thomas Carver and Suzi Kerr (2017), “Facilitating Carbon Offsets from Native Forests”, Motu Research Working Paper 17-01, Wellington NZ: Motu Economic and Public Policy Research, p.7.

¹⁰⁶ The Parliamentary Commissioner for the Environment recently noted that “Allowing a million hectares of marginal hill country to revert to scrub could capture the equivalent of about 17% of all the biological methane and nitrous oxide currently emitted each year for 50 years.” However not all this land is likely to revert immediately, at least not without some human intervention. See Parliamentary Commissioner for the Environment (2016), “Climate change and agriculture: Understanding the biological greenhouse gases”, p.72.

“a ‘pay-for-performance’ (PFP) contract that addresses an environmental issue. The PFP mechanism inherent in EIBs will be similar to that of SIBs, whereby the government (or another contracting entity) pays an agreed-upon return if impact performance targets, as specified in the investment contract, are met. EIBs tend to represent a ‘monetization’ of future costs savings, whereby investors are paid a return based on the amount of cost savings generated by a particular project.”

Applied to the problem of establishing permanent forest, this structure can be summarised thus:



The Permanent Forest Bond functions by bridging the social and temporal distance between contracting parties. The interests of these parties are as follows:

- The Crown** (the outcome funder) identifies a problem that needs solving and a solution it sees the value of investing in. In this instance, the combined problem is the need to reduce net greenhouse gas emissions, as well as avoid long-run environmental costs and economic opportunity costs from keeping marginal erosion-prone land in pasture. These negative externalities incur costs that fall upon wider communities as well as future generations; the only entity which represents all their interests is the Crown. The solution is to establish permanent forest on marginal erosion-prone land.

- **Investors** have a growing appetite for investments that are aligned with clear social and environmental outcomes. Bonds that enable positive integrated impacts are seen as an effective and relatively low-risk means to achieve this.
- **The intermediary** functions as the bond issuer (in this proposal) and is underwritten by the Crown. The entity manages investor capital and identifies contractors who can fulfil agreed-upon impact targets, such as x-hectares of forest, y-stems per hectare, and z-tonnes of carbon per year (noting that, for practical purposes, these are occasionally interrelated)
- **Landowners** interact directly with contractors and the intermediary, not directly with investors or the outcome funder (the Crown). This aligns well with the Crown's role as regulator which restrains its capacity to advocate, whereas the social sector agents that occupy the contractor and intermediary roles could engage proactively with the market, overcoming the informational and motivational deficits that prevent better land use. As part of the bond contracts, landowners will need to agree to a covenant to protect the permanence of forest, such as a QEII Covenant, Ngā Whenua Rāhui Kawenata, or a covenant specially tailored for this programme. Landowners benefit by accruing on-farm ecosystem services such as honey and soil production, avoided costs from reduced terrestrial erosion and increased resilience of vulnerable land, future carbon revenue opportunities after the bond has matured, as well as options to invest in the bond to receive repayments with interest in future.
- **Evaluators** assess whether impact targets have been met. If so, the outcome funder (the Crown) pays out the principal-plus-coupon in accordance with the pay-for-performance contracts. This money is returned to the investors upon maturity. This could be structured to include an interim payment schedule.

The table on the following page shows that the Integrated Impact Bond structure compares well with other existing or hypothetical programmes to finance the establishment of permanent native forest. (Note that this table is based on the authors' opinions of current policies and should only be used for heuristic purposes. At the time of writing, officials are providing advice on how to improve the ETS and PFSI based on the 2015/2016 ETS review, as well as wider work to improve the predictability of the carbon market.) The Perfect Model at top shows an ideal (and unrealistic) alignment to the variables that support permanent native forest outcomes. The other cells show the degree of alignment (green), misalignment (red) or moderate alignment (amber) to this Perfect Model. Given the scale of available land that would benefit from forest establishment, it is presumed that these different programmes are not mutually exclusive, but rather could function as a smorgasbord of financing options that will suit the specific preferences of landowners and the specific constraints of the site.

The Permanent Forest Bond only performs moderately on *Native forest mandate* and *Carbon sequestration potential* because it is open to accommodating mixed regimes of native/exotic forest in order to strike a balance between competing demands for native forest outcomes and high carbon outputs. The Perfect Model is unrealistic in this regard because native trees on most sites will grow more slowly and hence sequester carbon more slowly than exotic alternatives (this is more accurately captured in the contrast between Output Contracting and Forward Contracts for carbon farming). The Permanent Forest Bond aims to chart a pragmatic course between the maximal sequestration and native biodiversity outcomes.

	Upfront capital for planting	Mandate for native forest	De-risked for investors	De-risked for landowners	De-risked for government	Protection of forest	Incentivises cost effective delivery	Carbon storage potential up to 2050
Perfect Model	High	High	High	High	High	High	High	High
Permanent Forest Bond (PFB)	High	Moderate	Low	High	High	High	High	Moderate
Output contracting for native forest restoration	High	High	Low	High	Moderate	Variable	Low	Low
Emissions Trading Scheme (ETS)	Low	Low	Low	Variable	High	Low	High	Variable
Permanent Forest Sink Initiative (PFSI)	Low	Moderate	Low	Low	High	High	Moderate	Moderate

Afforestation Grant Scheme (AGS)	Moderate	Moderate	Moderate	Moderate	Moderate	Low	Moderate	Moderate
Forward contracts for carbon farming	High	Low	Moderate	Low	High	High	High	High

Note that the above table is based on the authors’ opinions of current policies and should only be used for heuristic purposes. Also note that investor and landowner will often be the same person or organisation, as for the PFSI. The low cost-effectiveness and carbon sequestration of *Output contracting* reflects its objective for high-quality native habitat restoration. *ETS* and *Forward Contracts*, by contrast, tends to incentivise fast-growing exotics that generate larger volumes of carbon credits. However, the variable status of *ETS*’s carbon sequestration up to 2050 reflects the dominance of production forest on rotation cycles; and the variable risk for landowners reflects the diverse possible arrangements between investors and landowners within the *ETS*. For forward contracts, by contrast, sequestration potential is high because the forest isn’t removed, and the forward contract providers (who buy the land) bear the risk on behalf of investors. The AGS finds a middle road through many of these variables.

7. Postscript

This report was drafted in mid-2017. Over the succeeding months, significant developments have occurred, which underline the authors' point that "The transition by financial markets to a low-emissions global economy has already begun", not only globally but within New Zealand too. However, it means that the main text of this report did not capture several New Zealand developments that deserve to be mentioned. This postscript acknowledges these advances in domestic climate finance.

7.1 Living Standards Framework

In February 2018, Prime Minister Jacinda Ardern and Finance Minister Grant Robertson announced that Treasury would work towards incorporating wellbeing measures into its 2019 Budget. Treasury also released a series of discussion papers on its Living Standards Framework which would inform this process, including individual discussion papers on human, natural and social capital respectively. In March 2018 this was augmented by a discussion of natural capital in Treasury's *He Puna Hao Pātiki: Investment Statement 2018: Investing for Wellbeing*, which further conceptualised how wellbeing could be integrated into the Budget. These are significant steps forward for the Living Standards Framework, which is discussed in §1.2 of this report.

In the same month, Statistics NZ released its *Environmental-economic accounts: 2018*, which accounts for the stocks and flows of natural capital in New Zealand through the United Nations' System of Environmental-Economic Accounting (SEEA) framework. These national accounts will generate data to be integrated - with data from other sources - into Treasury's wellbeing framework.

There is a significant amount of work to be done, but these developments signal a high-level commitment to take a more integrated approach to measuring national success. From the perspective of this report, a key question is how this framework will come to inform decision-making, especially to commitments of resources at the project level.

7.2 Green Bonds

There have been two significant movements in the green bond space since the August 2017 issuance of the NZ\$125 million kauri bond, jointly arranged by ANZ and the International Finance Corporation (IFC) (see §4.6.5 in the main document). The first is Contact Energy's Green Borrowing Programme; the second is the approval of Auckland Council's Green Bond programme.

In August 2017, Contact Energy finalised its \$NZ1.8 billion Green Borrowing Programme. This was certified under the Climate Bonds Initiative (CBI) framework, one of its largest single certifications, but also the first such issuance in New Zealand, and also the first certification of an entire debt programme globally. It will create access to a range of certified green debt instruments, including committed bank facilities, commercial paper, and listed retail bonds. This issuance was assisted by ANZ and assured by EY.

Crucially, the use-of-proceeds are domestic, used to (re)finance existing and future renewable generation assets that meet the CBI Standards. This is a significant point of difference to the ANZ/IFC kauri bond whose use-of-proceeds are limited to developing countries, thereby not unlocking finance for climate-aligned projects within New Zealand. By contrast, Contact's Green Borrowing Programme focuses on projects within New Zealand, first by retrospectively labelling Contact's existing geothermal assets that meet CBI's standards, secondly by preparing to incorporate Contact's hydropower assets in future. (CBI's standards for hydropower are still to be finalised, so the eligibility of Contact's hydropower assets must be verified in future when this criteria is complete). Accordingly, this is a significant step forward in domestic climate finance, where the issuance and use-of-proceeds are aligned to New Zealand-based infrastructure.

In March 2018, Auckland Council announced its intention to be the first council in New Zealand to establish a green bond framework, with an aspiration to issue green bonds later in the year. This will not be additional to planned expenditure, but rather an embedding of sustainability into Auckland Council's infrastructure provision. An issuance is expected to diversify the Auckland Council's potential investor base and sources of funding, and to reinforce the Auckland Council's green credentials and reputation as a green leader.

7.3 Green Investment Fund

Under the Confidence and Supply Agreement between the New Zealand Labour Party and the Green Party of Aotearoa New Zealand, the Government agreed to support the introduction of a Green Investment Fund. The details of this Fund are still to be determined.

The potential for a Green Investment Fund was discussed in §5.9 above, especially in terms of having a catalysing effect on the enabling environment for climate finance. This Fund has great potential to be an exemplar, innovator and repository of expertise to accelerate the transition toward climate-alignment in New Zealand, especially by precipitating a culture change in the investment community.

7.4 New Zealand Super Fund

In August 2017, NZ Super announced that its NZ\$14 billion global passive equity portfolio is now low-carbon, which constitutes 40% of the total NZ\$35 billion fund. In terms of impact, this means that (at 30th June 2017) the total Fund's carbon emissions intensity is 19.6% lower, and its exposure to carbon reserves is 21.5% lower, than if the changes hadn't been made.

In December 2017, NZ Super Fund was also one of six funds, governing a total of over USD\$2 trillion, to establish the One Planet Sovereign Wealth Fund Working Group. At a meeting at the Élysée Palace in Paris, during the One Planet Summit, this Working Group agreed to develop and publish in 2018 an environmental, social and governance (ESG) framework that addressed climate change issues and included methods and indicators to inform investors' priorities as shareholders and participants in financial markets.

8. Bibliography

- Addis, Rosemary (2015), "The Roles of Government and Policy in Social Finance". In Alex Nicholls, Rob Paton, and Jed Emerson (eds.), *Social Finance*, Oxford: Oxford University Press.
- Asia Investor Group on Climate Change, Investor Group on Climate Change, Institutional Investors Group on Climate Change, Investor Network on Climate Risk, United Nations' Principles for Responsible Investment Initiative, & United Nations Environment Programme's Finance Initiative (2016), "Global Investor Statement on Climate Change".
- Bak, Celine, Amar Bhattacharya, Ottmar Edenhofer and Brigitte Knopf (2017), "Toward a comprehensive approach to climate policy, sustainable infrastructure, and finance", G20 Insights: Co-Chair Brief, Climate Policy and Finance Taskforce.
- Bateman, Thomas S., and Michael E. Mann (2016), "The Supply of Climate Leaders Must Grow", *Nature Climate Change*, 6, pp. 1052-1054.
- Baudienville, Geraldine (2009), "Beyond grants: climate finance in developing countries", London: Overseas Development Institute.
- Bennett, Paula (2016), "Speech to the Climate Change and Business Conference", 11 October 2016. Retrieved from <https://www.beehive.govt.nz/speech/speech-climate-change-and-business-conference-0>
- Bhattacharya, A., Meltzer, JP., Oppenheim, J., Qureshi, Z., Stern, N. (2016). "Delivering on Sustainable Infrastructure for Better Development and Better Climate." Brookings Institute, New Climate Economy and Grantham Research Institute on Climate Change and the Environment.
- Bodnar, Paul, Jessica Brown, and Smita Nakhooda (2015), "What Counts: Tools to Help Define and Understand Progress Towards the \$100 Billion Climate Finance Commitment", Climate Policy Initiative, World Resources Institute, Overseas Development Institute.

- Brest, Paul and Kelly Born (2013), "When Can Impact Investing Create Real Impact?", *Stanford Social Innovation Review*, Fall 2013. Retrieved from https://ssir.org/up_for_debate/article/impact_investing
- Buchner, Barbara; Chiara Trabacchi, Federico Mazza, Dario Abramskiewn and David Wang (2015), "Global Landscape of Climate Finance 2015", San Francisco: Climate Policy Initiative.
- Buchner, Barbara; Federico Mazza and James Falzon (2016), "Global Climate Finance: An Updated View on 2013 and 2014 Flows", San Francisco: Climate Policy Initiative.
- Carbon Disclosure Project (2016), "Embedding a carbon price into business strategy", CDP North America Inc.
- Carbon Tracker Initiative (2013), "Unburnable Carbon 2013: Wasted Capital and Stranded Assets", London: Carbon Tracker Initiative and Grantham Research Institute on Climate Change and the Environment.
- Carbon Tracker Initiative (2015), "The \$2 Trillion Stranded Assets Danger Zone: How Fossil Fuel Firms Risk Destroying Investor Returns", London: Carbon Tracker Initiative.
- Carver, Thomas and Suzi Kerr (2017), "Facilitating Carbon Offsets from Native Forests", Motu Research Working Paper 17-01, Wellington NZ: Motu Economic and Public Policy Research.
- Channell, Jason et al. (2015), "Energy Darwinism II: Why a Low Carbon Future Doesn't Have to Cost the Earth", Citi GPS: Global Perspectives & Solutions, August 2015.
- Cheng, Paul (2011), *The Impact Investor's Handbook: Lessons from the World of Microfinance*, CAF Venturesome: Market Insight Series, February 2011
- Clark, Pilita (2015), "Mark Carney Warns Investors Face 'Huge' Climate Change Losses", *Financial Times*, 29 September 2015.

- Climate Bonds Initiative (2016), *Bonds and Climate Change: State of the Market in 2016*. Report prepared by Climate Bonds Initiative, commissioned by HSBC.
- Durie, Mason (2006), “Measuring Māori wellbeing.” New Zealand Treasury guest lecture series. Wellington, New Zealand: Treasury.
- Economist Intelligence Unit (2015), “The Cost of Inaction: Recognising the Value at Risk from Climate Change,” London; New York; Hong Kong; Geneva: The Economist Intelligence Unit Limited.
- Funtowicz, Silvio, and Jerome R. Ravetz (1993), *Futures* 25, pp.739–755.
- Hall, David (2016), “Our Forest Future”, Auckland N.Z.: Pure Advantage.
- Hall, David (2017), “Greening the Future: a case for environmental impact bonds”, *Policy Quarterly* 13(2), pp.41–48.
- International Bank for Reconstruction and Development (2009), “Improved Energy Technologies for Rural Cambodia”, New York: The World Bank.
- International Energy Agency (2015), *Energy and Climate Change: World Energy Outlook Special Report*, Paris: IEA.
- Jackson, Tim (2009/2017), *Prosperity Without Growth: The Transition to a Sustainable Economy*, report prepared for the Sustainable Development Commission, London: Routledge.
- Jansson, AnnMari, Monica Hammer, Carl Folke, and Robert Costanza, eds. (1994). *Investing in Natural Capital: The Ecological Economics Approach to Sustainability*, Washington D.C.: International Society for Ecological Economics.
- J. P. Morgan, Rockefeller Foundation and Global Impact Investing Network (2010), “Impact Investments: An Emerging Asset Class”, 29th November 2010.
- Kidney, Sean (2017), “New CBA Climate Bond: AUD 650m: Australia bolsters international best practice status”, Climate Bonds Initiative blog, 29th March 2017.

- Micale, Valerio, Karoline Hallmeyer and Jessica Williams (2016), “Energy Efficiency Enabling Initiative: Lab Instrument Analysis”, San Francisco: Global Innovation Lab for Climate Finance.
- Ministry for Primary Industries (2015), “The Permanent Forest Sink Initiative: Proposals for Improvement”, MPI Discussion Paper 2015/16, Wellington, NZ: Ministry for Primary Industries.
- Ministry for the Environment (2016), *National Interest Analysis: The Paris Agreement*, Wellington, NZ: New Zealand Government.
- Ministry of Business, Innovation & Employment (2016), “Electricity Demands and Generation Scenarios: Scenarios and Results Summary”, Wellington N.Z.
- Moody’s Investor Services (2017), “Announcement: Moody’s: Global green bond issuance could rise to USD206B in 2017 after record in 2016, Global Credit Research”, 18th January 2017.
- Office of the Minister for Climate Change Issues (2016), “New Zealand’s intended contribution to the new global climate change agreement.” Paper to the Cabinet Economic Growth and Infrastructure Committee.
- OECD, IEA, NEA & ITF (2015), *Aligning Policies for a Low-carbon Economy*, OECD Publishing, Paris.
- OECD (2013), “Climate and Carbon: Aligning prices and policies”, *OECD Environment Policy Papers*, No. 1, Paris: OECD Publishing.
- OECD (2015), “Green Investment Banks”, *OECD Policy Perspectives*, Paris: OECD Publishing.
- OECD (2015), *Aligning Policies for a Low-Carbon Economy*, Paris: OECD Publishing.
- OECD (2016), “The Economic Consequences of Climate Change”, ENV/EPOC(2015)12/FINAL, 23 March 2016.
- OECD (2017), *Mobilising Bond Markets for a Low Carbon Transition*, Paris: OECD Publishing.

- OECD (2017), *Investing in Climate, Investing in Growth*, Paris: OECD Publishing.
- Office of the Minister for Climate Change Issues (2016), "New Zealand's intended contribution to the new global climate change agreement." Paper to the Cabinet Economic Growth and Infrastructure Committee, Wellington N.Z.
- Office of the Minister for Climate Change Issues (2016), "Paris Agreement on climate change – ratification and domestic action", Cabinet Paper prepared for the Cabinet Economic Growth and Infrastructure Committee, Wellington: New Zealand Government.
- Parliamentary Commissioner for the Environment (2016), "Climate change and agriculture: Understanding the biological greenhouse gases", 19 October 2016, Wellington N.Z.: Parliamentary Commissioner for the Environment.
- Pearce, David and Giles Atkinson (1995), "Measuring sustainable development." In: Bromley, Daniel, (ed.), *Handbook of Environmental Economics*. Cambridge, Mass., Blackwell Publishers, 166–81.
- Raworth, Kate (2017), *Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist*, White River Junction, VT: Chelsea Green Publishing.
- Reisinger, A., Kitching, R.L., Chiew, F., Hughes, L., Newton, P.C.D., Schuster, S., Tait, A., Whetton, P. (2014). *Australasia climate change 2014: Impacts, adaptation and vulnerability. Part B: Regional aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* In: [Barros, V.R., C.B. Field, D.J. Dokken, M.D. Mastrandrea, K.J. Mach, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds)] (ed.). Cambridge University Press: Cambridge, UK and New York, USA, pp. 1371-1438.
- Responsible Investment Association Australasia (2017), *Responsible Investment Benchmark Report 2017: New Zealand*. Report prepared by KPMG and RIAA.

- Richter, Jessika Luth and Lizzie Chambers (2014). "Reflections and Outlook for the New Zealand ETS", *Policy Quarterly*, 10(2), pp.57-66.
- Royal Society of New Zealand (2016). *Climate change implications for New Zealand*. Wellington: RSNZ.
- Saunders, Caroline and Paul Dalziel (2014), *Wellbeing Economics: Future Directions for New Zealand*, Wellington: BWB Texts.
- Shepherd et al. (2008), "Nature and scale of eligible post-1989 non-planted forests." Landcare Research Contract Report. Report prepared for Ministry of Agriculture and Forestry.
- Sherwin, Murray (2012), "Managing for Success: Small Economies in a Dangerous World", 22nd February 2012.
- Smith, Stephen and Nils Axel Braathen (2015), "Monetary Carbon Values in Policy Appraisal: An Overview of Current Practice and Key Issues", OECD Environment Working Papers, No. 92, OECD Publishing, Paris.
- Social Impact Investment Taskforce (2014), "Impact Investment: The Invisible Heart of Markets", Report of the Social Impact Investment Taskforce established under the UK's G8 Presidency, 15 September 2014.
- Stern, Nicholas and Simon Dietz (2014), 'Endogenous Growth, Convexity of Damages and Climate Risk: How Nordhaus' Framework Supports Deep Cuts in Carbon Emissions', Working Paper (Leeds, UK; London; UK: Centre for Climate Change Economics and Policy & Grantham Research Institute on Climate Change and the Environment
- Stiglitz, Joseph, Amartya Sen and Jean-Paul Fitoussi (2009), *Report by the Commission on the Measurement of Economic and Social Progress*, Paris: Government of France.
- Task Force on Climate-Related Financial Disclosures (2017), Recommendations of the Task Force on Climate-Related Financial Disclosures, report prepared for Mark Carney, Chairman of the Financial Stability Board.

- Thindwa, Jeff (2001), "Enabling environment for civil society in CDD projects", World Bank Social Development Family, CDD Learning Module, Washington D.C.: World Bank.
- Toniic Institute (2016), "Venture Philanthropists and Impact Investors". Retrieved from <http://www.toniic.com/venture-philanthropists-and-impact-investors/>
- UNDP & Climate Analytics (2016), "Pursuing the 1.5°C Limit: Benefits and Opportunities", 2016 Low Carbon Monitor, (UNDP: New York).
- UNFCCC Standing Committee on Finance (2014), *2014 Biennial Assessment and Overview of Climate Finance Flows Report*, Bonn, Germany: United Nations Framework Convention on Climate Change (UNFCCC).
- United Nations Conference for Trade and Development (2014), *World Investment Report, Investing in SDG's: An Action Plan*, Geneva: UNCTD.
- Van der Meer, Kees, and Marijn Noordam (2004) *The World Bank: The Use of Grants to Address Market Failures: A Review of World Bank Rural Development Projects, Agriculture and Rural Development Discussion Paper 27*
- Vivid Economics (2017), "Net Zero in New Zealand: Scenarios to Achieve Domestic Emissions Neutrality in the Second Half of the Century: Summary Report", Report prepared for GLOBE-NZ, March 2017.
- Wilson, K. E. (2015), "Policy Lessons from Financing Innovative Firms", OECD Science, Technology and Industry Policy Papers, No. 24, OECD Publishing, Paris.
- World Bank (2015), *The FASTER Principles for Successful Carbon Pricing : An Approach Based on Initial Experience*, Washington, D.C.: World Bank Group.
- World Bank, Ecofys & Vivid Economics (2016), *State and Trends of Carbon Pricing 2016*, Washington, DC: World Bank.
- World Health Organization (2016), "Climate and Health Country Profile - 2015", Geneva: WHO.

Yao, Richard et al., (2013), "Planted Forests", in Ecosystem Services in New Zealand (John Dymond, ed.), Lincoln, NZ: Manaaki Whenua Press.