

ZERO EMISSIONS/ SUSTAINABLE RETURNS

STRATEGIES FOR ACHIEVING
NET-ZERO EMISSIONS



Investor Group on
Climate Change



The Investor Group on Climate Change (IGCC)

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

www.igcc.org.au

Acknowledgments

IGCC would like to thank and acknowledge Joanne Saleeba as the Lead Author of this report.

IGCC would also like to thank the members of the IGCC Transition to Zero Carbon Working Group who supported the development of this practitioner guide, and in particular the Working Group Chair Nicole Bradford from Cbus, for their valuable time and expertise.

February 2020



FOREWORD

In Australia, the bushfires of the ‘black summer’ of 2019/2020 have clearly demonstrated the costs and consequences of allowing unchecked global warming. At just 1 degree of warming, Australian communities have faced frightening heat, drought and fire conditions at an unprecedented scale. This is potentially just a taste of things to come if we fail to follow through the commitments made under the Paris Agreement.

Developing practical tools and resources to help accelerate investor action are a core part of mobilising capital to deliver climate solutions and to de-risking our economy from the financial and economic risks also presented by climate change.

In the years since the finalisation of the Paris Agreement in 2015 and the release of the Taskforce on Climate-related Financial Disclosures (TCFD) reporting framework, governments, companies and investors have increasingly embraced the overarching goal of transitioning to net-zero emissions by 2050.

Achieving this will not be easy, but it is essential if we are to hold global warming to less than 2 degrees Celsius and move towards a goal of 1.5 degrees Celsius.

This includes working through the very real challenges of setting net-zero targets for a whole portfolio or for specific asset classes, and for developing strategies for delivering.

IGCC has commissioned this review of the current state of play for investor practice and practitioner guide on investor strategies for pursuing net-zero emission portfolios while ensuring sustainable returns. It aims to provide an overview of current investor thinking and real-world examples of how investors are transitioning to net-zero emissions.

Based on both industry research and direct engagement with institutional investors in the market, it also includes a summary of current barriers and challenges to moving to net-zero, as well as the industry initiatives emerging to solve for these issues.

I would like to thank the members of the IGCC Transition to Zero Carbon Working Group who have steered the development of this guide and to Joanne Saleeba who authored this report.

Climate change is often characterised as a ratcheting risk, with multiple financial, economic and social impacts. But science tells us that a global economy which moves to net-zero emissions by 2050 will increase the likelihood that we can keep global warming to 1.5 degrees Celsius.

IGCC looks forward to working with our members and across the industry to continue to develop the solutions needed to invest for a climate resilient net-zero emissions economy by 2050.



Emma Herd,
CEO, IGCC



TABLE OF CONTENTS

FOREWORD	3
INTRODUCTION AND BACKGROUND	5
COMMITTING TO NET-ZERO EMISSIONS	8
Governments.....	8
Companies.....	9
Investors	10
DEFINING NET-ZERO EMISSIONS FOR INVESTORS	14
Drivers of interest in net-zero emissions portfolios.....	14
Defining net-zero emissions.....	14
Timeframes.....	15
MULTI-ASSET PORTFOLIO WIDE NET-ZERO TARGETS	15
ASSET CLASS STRATEGIES FOR NET-ZERO EMISSIONS	19
Equities.....	19
Fixed income	23
Real estate	25
Agriculture and forestry.....	29
Infrastructure	32
Private equity.....	34
Investor organisational net-zero.....	34
CHALLENGES AND BARRIERS TO NET-ZERO	36
Does net-zero equal paris aligned?	36
Lack of methodologies	36
The offsets dilemma.....	37
CONCLUSION	39
REFERENCES	40



INTRODUCTION AND BACKGROUND

For more than a decade, leading investors have been developing strategies with the aim of limiting their contribution to global warming and transitioning toward a low carbon economy.

In 2015, the Paris Agreement set a clear goal of keeping the global temperature rise this century well below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius. This provided the global investment community with a specific target with which to align their portfolios.

Since the finalisation of the Paris Agreement there has been significant growth in investor strategies seeking alignment with the Paris Agreement and this is set to continue. Most IGCC members have implemented at least one climate aligned investment strategy and nearly all intend to increase these investments over the coming years¹

Climate-aligned investment strategies

Climate-aligned investment strategies are investment strategies that are aligned with the transition to a low carbon future. These strategies are many and varied and include:

- Low carbon (relative to a benchmark)
- Green financing
- Climate solutions e.g. technology and systems to reduce emissions such as renewable energy, technologies improving energy efficiency, low emissions transport including electric vehicles
- Adaptation or resilience.

There has also been a growing shift from an ad hoc, opportunistic approach to climate-aligned investment to more holistic, long-term strategies to ensure portfolios are aligned with the targets set out in the Paris Agreement.

This movement has been encouraged, supported and guided by a range of investor and multi-stakeholder initiatives including the following (listed in chronological order):



Science Based Targets Initiative (SBTi)²

In 2015, CDP, the UN Global Compact, the World Resources Institute, the World Wide Fund for Nature and the We Mean Business Coalition collaborated to form the SBTi. The SBTi mobilizes companies to set science-based targets and boost their competitive advantage in the transition to the low carbon economy. It does this by defining and promoting best practice in science-based target setting, offers resources and guidance to reduce barriers to adoption, and independently assesses and approves companies' targets. As at December 2019, 285 companies responsible for more than 752 million metric tons of CO₂ equivalent emissions per year from their operations—more than the combined annual emissions of France and Spain—have set greenhouse gas emissions reduction targets in line with what science says is required to avert dangerous climate change and meet the goals of the Paris Agreement. The SBTi is currently finalising its methodology for financed emissions for investors and lenders. This will allow investors to have their portfolio emissions reduction targets validated by the initiative.

Financial Stability Board's Task Force on Climate-related Financial Disclosures (TCFD)³

Established in early 2016, the TCFD released its final recommendations in mid 2017. The Task Force emphasised the importance of transparency in pricing risk—including risks related to climate change—to support informed, efficient capital-allocation decisions. The TCFD provide a framework of voluntary, consistent, climate-related financial risk disclosures for companies and other organisations to facilitate more effective climate-related financial disclosures through their existing reporting processes. These disclosures assist companies to demonstrate their strategic recognition of climate change and the actions they are taking to mitigate potential risks and capitalise on opportunities. The TCFD has resulted in increased disclosure by companies and investors including setting of targets. As at June 2019, 785 companies and other organisations committed to support TCFD. In addition, 340 investors with nearly US\$34 trillion in AUM are asking companies to report under the TCFD

Transition Pathways Initiative (TPI)⁴

Launched in 2017, the TPI uses publicly disclosed company information sourced and provided by TPI's data partner, FTSE Russell, to assess companies' preparedness for the transition to a low carbon economy, supporting efforts to address climate change. More than 60 investors, representing over US\$18 trillion combined assets under management and advice globally, have committed to using the tool and its data in a range of ways, including to inform their investment research, in engagement with companies and in tracking the holdings of their investment managers. The TPI complements existing initiatives and frameworks, by aligning with prevailing disclosure initiatives and with investor's climate change and sustainability expectations. It is also currently being aligned with the requirements of the TCFD.



Climate Action 100+⁵

Launched in 2017, the Climate Action 100+ is an investor initiative to ensure the world's largest corporate greenhouse gas emitters take necessary action on climate change. These companies include 100 'systemically important emitters', accounting for two-thirds of annual global industrial emissions, along with 60 additional companies with significant opportunity to drive the clean energy transition. Investors supporting the Climate Action 100+ are actively engaging with these companies to ensure the message from the investment community is clear and consistent. The five-year initiative's first progress report was released in late 2019.

The Investor Agenda⁶

The Investor Agenda was established in 2018 to enable the global investor community to accelerate and scale actions that are critical to tackling climate change and achieving the goals of the Paris Agreement. The Investor Agenda provides a set of actions investors can take in four key focus areas of investment, corporate engagement, investor disclosure and policy advocacy.

Many of these focus areas are supported by other initiatives outlined in this section. For example, corporate engagement is supported by the CA100+, while investor disclosure is supported by the TCFD.

Investor Energy & Climate Action Toolkit (InvECAT) (2019)⁷

The InvECAT project aims to provide Non-State Actors, particularly companies and financial institutions, with a platform of tools to 1) set science-based targets; 2) help them understand their contribution to the Paris Agreement; and 3) implement their climate change action strategies. In time, the platform will showcase a full suite of next-generation climate action tools.

Despite these initiatives, however, there remains some uncertainty as to how to translate the Paris Agreement into tangible targets for investment portfolios. This is largely because the goals of the Paris Agreement are quantified in terms of temperature increases, which is not a metric that can be easily related directly back to investments.

Further guidance came in October 2018, when the United Nations Intergovernmental Panel on Climate Change showed⁸ that in order to stand a reasonable chance of achieving the Goal of the Paris Agreement, global carbon dioxide emissions needed to be net-zero by 2050 i.e. they translated the temperature goal into the carbon emissions goal, which investors have the ability to measure.

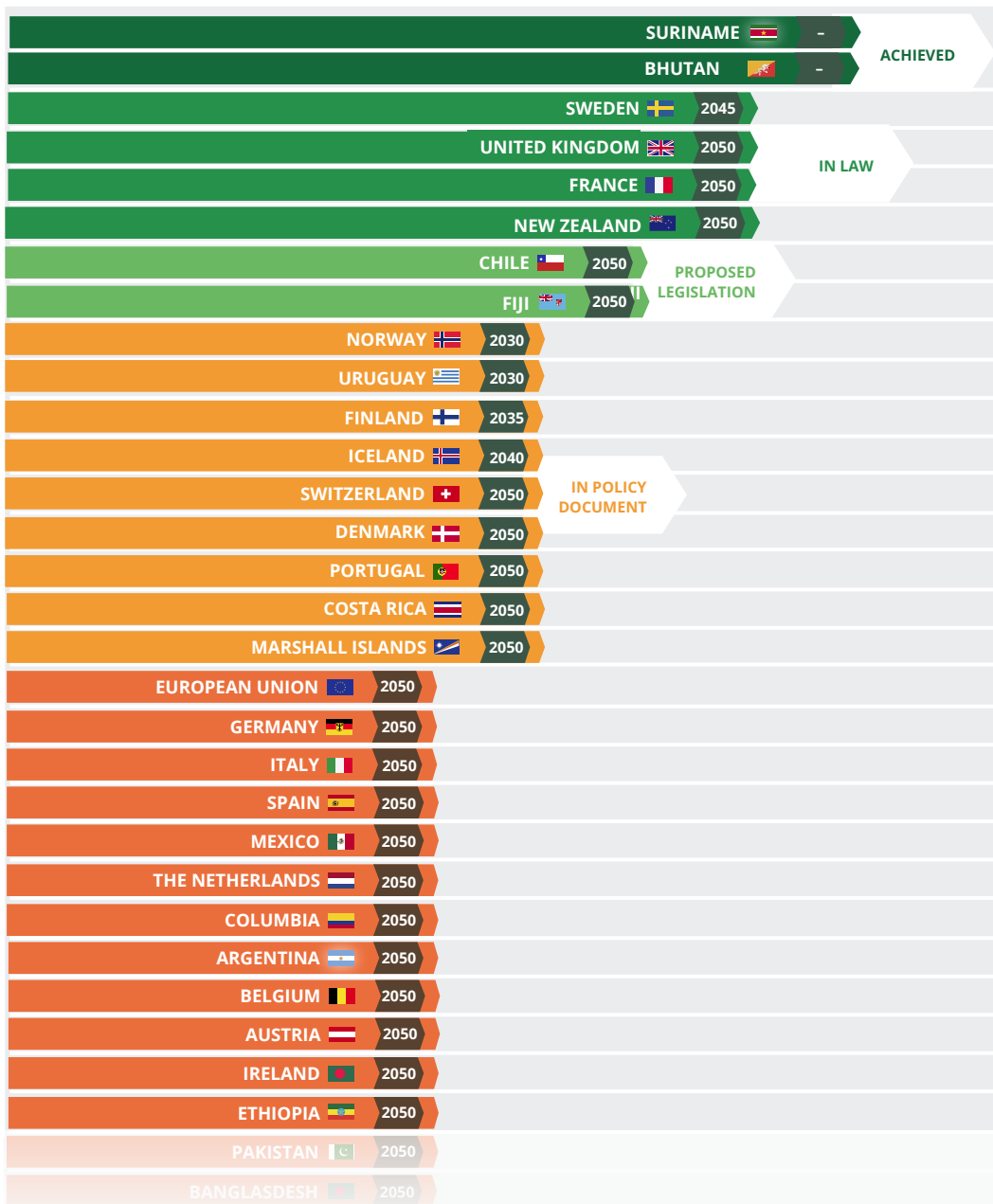
PART 1: COMMITTING TO NET-ZERO EMISSIONS

The focus on achieving net-zero emissions by 2050 is growing across the economy as a key objective. There has already been some early movement towards net-zero emissions by governments, companies and investors.

GOVERNMENTS

In June 2019, analysis by the Energy and Climate Intelligence Unit showed that almost one-sixth (16%) of global GDP is now covered by net-zero emissions targets set by governments, whether at the level of nations, regions or cities⁹.

The diagram below shows some of the countries that have already set targets, or committed to do so, for reaching net-zero emissions on timescales compatible with the Paris Agreement temperature goals.





These nations are joined by at least 11 states and regions such as New York State, California, and Catalunya and at least 23 cities including Barcelona, Los Angeles, Karachi and Johannesburg.

While the Australian Federal Government is yet to set a target to achieve net-zero emissions, all of Australia's states and territories have set a target to achieve this by 2050, if not before¹⁰.

COMPANIES

Over the last decade thousands of major global companies have started reporting their climate change risks, opportunities and their carbon footprint. This has been driven by initiatives such as the Global Reporting Initiative (GRI), the Carbon Disclosure Project (CDP) and more recently, the TCFD.

Many of these companies have set, or are in the process of setting, emissions reduction targets. More recently some of them have committed, or are committing, to net-zero emissions targets.


Analysis by the Energy and Climate Intelligence Unit shows that at least 34 companies with annual revenue above US\$1 billion have set net-zero emissions targets – and a few have already met them.

Atlassian¹¹

In September 2019, Atlassian cofounder Michael Cannon-Brookes announced the AU\$26 billion Australian software company's commitment to net-zero emissions by 2050.

Some sectors are significantly more progressed in terms of incorporating a net-zero emissions goal into their business strategy. For example, ClimateWorks' Net-zero Momentum Tracker found that 43% of Australia's largest listed property companies have made commitments that closely align with the Paris Agreement, aiming to achieve net-zero greenhouse emissions before 2050 for their owned and managed assets. Conversely, while 85% of the banks assessed are taking steps to reduce their investment and lending portfolio emissions, these commitments are not yet comprehensive or fully aligned with the Paris Agreement goals.

TPI found that only 13 out of the largest 132 coal, electricity, and oil and gas companies have made commitments to reduce their greenhouse gas emissions to net-zero. Of these thirteen firms, nine had set a date of 2050 to achieve net-zero, while four had set a date of 2025 or 2030. The extent of the companies' commitments also varies. While all thirteen companies committed to achieving net-zero direct emissions (those produced directly by the extraction of coal, oil or gas, or generation of electricity), only three pledged to eliminate indirect emissions (such as the emissions produced by generating the electricity used in their processes, or down the line from coal or gas extracted by the company, but burned by other firms)¹².



There is increasing evidence that achieving net-zero emissions in sectors where decarbonisation is generally thought to be hard, such as aviation, shipping, steel and cement, is technically and financially possible by 2050 (in developed countries)¹³. In November 2019, Qantas announced a commitment to net-zero emissions by 2050¹⁴.

Energy Transitions Commission (ETC)¹⁵

The aim of the ETC is to accelerate change towards low carbon energy systems that enables robust economic development while limiting the rise in global temperature to well below 2 degrees Celsius. Comprised of commissioners drawn from incumbent energy companies, industry disruptors, investors, equipment suppliers, non-profit organisations, advisors, and academics, the ETC will provide decision makers with insights and options for action at local and sector level, based on objective research and wide engagement with actors in the energy system.

In 2018, the ETC report titled *Mission Possible: Reaching net-zero carbon emissions from harder-to-abate sectors by mid-century*, outlined the possible routes to fully decarbonize cement, steel, plastics, trucking, shipping and aviation – which together represent 30% of energy emissions today and could increase to 60% by mid-century as other sectors lower their emissions. It concluded that these sectors could reach net-zero by mid-century at a cost below 0.5% of global GDP.

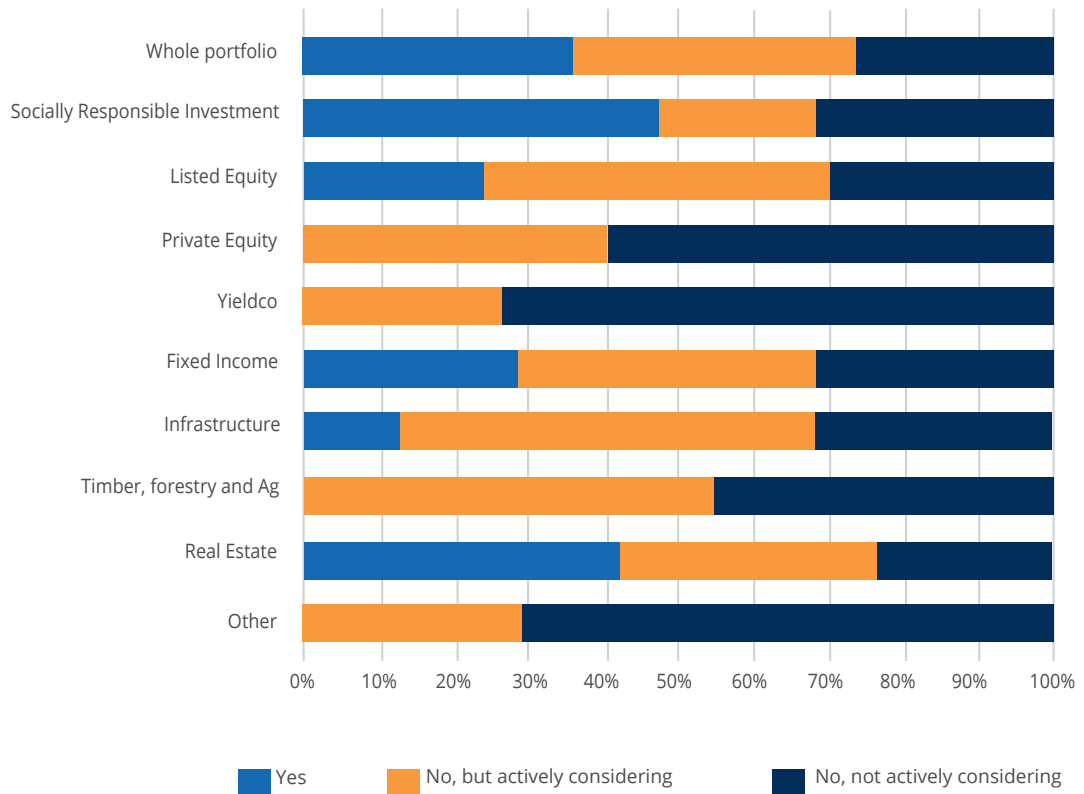
Mission Possible Platform (MPP)¹⁶

In 2019, the World Economic Forum and the Energy Transitions Commission launched the MPP to achieve net-zero carbon emissions by mid-century from a group of traditionally “hard-to-abate” industry sectors by creating and delivering technology, policy, and financing solutions. The MPP will host a series of climate initiatives, bringing together business leaders from heavy industry and heavy duty transport sectors to work on concrete actions to set these carbon-intensive sectors on a path to climate neutrality, in collaboration with a network of experts and policy partners.

INVESTORS

While a significant number of investors have, or are developing, ‘climate aligned’ investment strategies, a much smaller number have set specific targets in relation to these strategies. For example, only 35% of investors have set targets for their whole portfolio, just over 40% of real estate investors and less than 25% of listed equities investors have set targets.

INVESTORS SETTING A PORTFOLIO OR ASSET CLASS SPECIFIC TARGET FOR CLIMATE ALIGNED INVESTMENT (2019)¹⁷



These 'climate aligned' targets vary and include measures such as:

- Reduction in absolute emissions
- Reduction in emissions intensity (sectoral decarbonisation approach)
- Reduction in economic intensity
- Carbon avoided.

Investors are beginning to turn their attention to net-zero emissions targets. This is evidenced by recent investor initiatives focusing on net-zero as well as the emergence of net-zero investment strategies.



Net-zero Asset Owner Alliance (2019)¹⁹

Launched at the United Nations Climate Change Summit in New York in September 2019 and representing more than US\$2 trillion in assets under management, the Alliance demonstrates united investor action to make finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.

To this end, members of the Alliance have committed to transitioning their investment portfolios to net-zero emissions by 2050 consistent with a maximum temperature rise of 1.5 degrees Celsius above pre-industrial temperatures, taking into account the best available scientific knowledge including the findings of the IPCC report, and regularly reporting on progress, including establishing intermediate targets every five years in line with the Paris Agreement.

The Alliance will seek to avoid duplication by working with and enhancing a range of other existing initiatives¹⁸ to achieve this. The Alliance will be governed by a CEO-level steering group, will be provided secretariat support from UNEPFI and PRI and will work with Mission2020 and WWF as strategic/scientific partners. The Alliance's activities are grouped into 'tracks' to be undertaken by working groups including:

- Monitoring, Reporting & Verification (MRV) – developing framework and asset class methodologies to set (ahead of COP 26) more specific targets to 2025
- Engagement – Utilise Climate Action 100+ and WEF Mission Possible to advocate for corporate and/or sector net-zero 2050 targets
- Policy – Amplified investor requests to governments, regulators, bi-lateral dialogue, etc
- Net-zero investments – Scoping to begin in 2020.

IIGCC Paris Aligned Investment Initiative²⁰

The Paris Aligned Investment Initiative is being led and coordinated by the European focussed Institutional Investors Group on Climate Change (IIGCC), based in London, with a steering group of leading asset owners. More than 60 investors, representing over US\$15 trillion are involved in the initiative, which will provide a framework for investors to implement investment strategies consistent with the goal of net-zero emissions by 2050. The framework will set out best practice approaches and methodologies to achieve targets to reduce carbon emissions and to increase investments in climate solutions across asset classes and through strategic asset allocation.

Locally, the Australia & New Zealand focussed Investor Group on Climate Change (IGCC) have established Pathways to a net-zero emissions economy²¹ as one of their climate change policy priorities for 2019-2022. This includes developing economy wide strategies to achieve net-zero emissions by 2050.

INVESTOR GROUP ON CLIMATE CHANGE: AN INVESTOR VIEW OF CLIMATE POLICY

AUSTRALIA AND NEW ZEALAND: CLIMATE CHANGE POLICY PRIORITIES 2019-2022

Pathways to a net zero emissions economy

- Align 2030 targets to 1.5-2°C Paris Agreement objectives
- Develop economy-wide strategies to achieve net zero emissions by 2050
- Implement durable policy frameworks to achieve net zero emissions (emissions policy embedded in Australia's national electricity laws)
- Strengthen market-based carbon pricing (Australia's Safeguard Mechanism, New Zealand Emissions Trading Scheme)

Manage the energy sector transition

- Align energy strategy and policy forecasts with the Paris Agreement objectives
- AEMO's Integrated System Plan is based on achieving net zero emissions electricity by 2050
- Public financing vehicles' (CEFC and NZGIF) mandates and activities accelerate private sector investment
- Independent statutory economic transition authorities are created to plan for an orderly transition

Build resilient communities and economies

- Regularly publish assessments of infrastructure, sectors and regions at risk from climate change
- Address systemic barriers to climate change adaptation
- Ensure adequate science funding and data provision for climate risk assessments
- CEFC and NZGIF facilitate private sector investment in climate change adaptation
- Embed climate change as a systemic financial risk into corporate and financial regulation and disclosure frameworks
- Develop and implement Sustainable Finance Roadmaps

RESILIENT NET ZERO EMISSIONS ECONOMIES

In addition, under the *IGCC 2022 Strategy: Investing for a climate resilient net-zero emissions economy*²², one of the IGCC's five areas of strategic focus is to catalyse net-zero investments. As a first step to achieving this, by 2022 all IGCC members will have in place, or have committed to implementing, a Climate Change Policy and Roadmap, consistent with the goals of the Paris Agreement and framed by the TCFD and be investing consistent with their policy. IGCC has established a new Transition to Zero Carbon Working Group to develop investment tools and solutions to catalyse net-zero investment.



PART 2: DEFINING NET-ZERO EMISSIONS FOR INVESTORS

DRIVERS OF INTEREST IN NET-ZERO EMISSIONS PORTFOLIOS

In recent years, there has been an increase in the recognition of climate change risks and opportunities across the investment community, driven by a range of factors, including:

- Emerging legislation and regulation
- Increasing reporting requirements e.g. TCFD
- Greater recognition of the financial materiality of Environmental, Social and Governance (ESG) issues generally, and climate risks specifically; and
- Evolving understanding of fiduciary and trustee obligations and duties.

The drivers for net-zero emissions portfolios specifically identified during the collection of information for this report were reasonably consistent across asset owners, asset managers and across asset classes. The top three drivers were:

- Investor or beneficiary demand
- Industry leadership
- Risk mitigation.

Given the findings of previous IGCC research that client demand for ‘climate aligned’ products was still low²³, it would be interesting to understand how investor or beneficiary demand is currently being identified by investors.

DEFINING NET-ZERO EMISSIONS

There is currently no applicable global definition of net-zero emissions in any asset class. However, this has not stopped leading investors from pursuing a net-zero target. These investors have developed their own definition and methodology for net-zero, including carbon emissions covered, strategies to reduce emissions and timeframe for achievement of the target. As a result, the definitions of net-zero emissions differ between managers within an asset class as well as across asset classes.

What can be observed in the case studies presented in this report is that while the definitions may differ, investors generally go through a similar process when developing their net-zero emissions target.



This includes:


1. **Define Scope:** Defining the scope of greenhouse gas emissions to be covered by the commitment, e.g. the types and sources of greenhouse gas emissions;
2. **Measure:** Calculating the emissions to be covered by the commitment i.e. carbon footprint;
3. **Reduce Emissions:** Identifying emissions reduction strategies and approaches to be implemented and the timeframe over which they will be implemented;
4. **Offset:** Purchasing and retiring offsets equal to the residual emissions from the date which the strategy has committed to be net-zero, and on-going thereafter.

While this report is specifically focused on investors that have committed to achieving net-zero emissions, a large number of investors across all asset classes are pursuing emissions reduction for their portfolios or individual assets within their portfolios without necessarily committing to net-zero.

TIMEFRAMES

The timeframes in which investors are committing to deliver on a net-zero emissions target can differ quite significantly across different investment strategies and different asset classes. For example, listed equities strategies with net-zero targets currently in the market are already achieving net-zero by incorporating the purchase and retirement of offsets equal to residual emissions in the portfolio from inception of the strategy. In contrast, real estate strategies with net-zero emissions targets currently in the market are not set to achieve net-zero until 2030 and beyond.

To determine the suitability of a net-zero investment strategy in relation to their own objectives, investors will need to assess the suitability of the timeframe for achieving net-zero (in relation to their beliefs about the trajectory of the pathway to net-zero), the strategy they pursue and the cost associated with achieving the target within the specified timeframe. An investor's view about the suitability of a timeframe for achieving net-zero may change over time as more information becomes available on the trajectory necessary to keep the global temperature rise this century well below 2 degrees Celsius above pre-industrial levels and closer to 1.5 degrees Celsius.



PART 3:

MULTI-ASSET PORTFOLIO WIDE NET-ZERO TARGETS

As mentioned in the previous section, the first steps to setting a net-zero emissions commitment are generally defining the scope of greenhouse gas emissions to be covered by the commitment and then calculating these emissions (i.e. measuring their carbon footprint). While many investors are measuring their carbon footprint in some asset classes (most notably listed equities and property), very few have made progress in measuring their carbon footprint across their entire multi-asset portfolios.

As a result, there are only a couple of Australian or New Zealand investors that have set multi-asset portfolio wide targets to achieve net-zero emissions by 2050.

Australian Ethical Investment²⁴

COMMITMENT

In 2014, Australian Ethical Investment set a net-zero by 2050 target for the portfolio of investments underlying their 13 super and pension options and 8 managed funds. These comprise single sector and diversified investment options and funds. Asset classes include Australian equities, international equities, fixed income, property, cash and alternatives.

Date for achieving net-zero emissions: 2050. An earlier target date will be assessed as part of the verification of Science Based Targets

Funds covered: AU\$3.87 billion as at 31 December 2019

APPROACH

Australian Ethical have a strategy to reduce emissions associated with their portfolio of investments which includes not investing in companies assessed to be obstructing the objectives of the Paris Agreement. This assessment depends on the company and its sector. For example, in the energy sector Australian Ethical doesn't invest in oil, gas or coal companies (excluding a transition company like Contact Energy) and rather invests in clean energy solutions like energy efficiency, renewable energy and energy storage. In the transport sector they avoid investment in conventional cars and trucks and air travel because of their high emissions intensity compared to rail, ships and buses and other forms of public transport.

Australian Ethical also engage with companies to influence better management of the climate impacts associated with the production, supply, consumption and disposal of the company's products and services. They aim to encourage better measurement and reporting of direct and indirect greenhouse gas emissions; emissions reduction target setting; and analysis of the resilience of the company's business strategy to different climate scenarios. They also aim to reduce investee companies' contribution to global warming as well as reducing climate-related harm to their business prospects.

CARBON EMISSIONS

As at 31 December 2018, the carbon emissions associated with Australian Ethical's investments in listed equities were 89,830 tCO₂e, being 65% less than an equivalent investment in the market benchmark. Australian Ethical currently only calculate the carbon emissions associated with their investments in listed equities. Once finalised, the SBTi's 'Science-Based Methodology for Investor Portfolios' will be used to calculate the carbon emissions associated with investments in other asset classes.

CARBON EMISSIONS COVERED

Australian Ethical calculate carbon intensity from direct and some indirect emissions (Scope 1 and 2 emissions) of the companies relative to their revenue. In recent years, this footprint was calculated using tools and data provided by MSCI ESG Research. Prior to 2018, they used S&P Trucost to calculate their footprint.

Scope 1: Yes

Scope 2: Some

OFFSETS

At this time, Australian Ethical do not anticipate using carbon offsets to achieve their target.

FINANCIAL RETURNS

Australian Ethical has not assessed the financial benefits associated with the net-zero target. However, they believe that investing in line with the target positively positions their investment portfolios to take advantage of climate-related opportunities and reduce climate-related risks. They also believe that risk adjusted returns will be stronger in a low, rather than a high, warming world.

Source: Australian Ethical Investment

VicSuper²⁵

COMMITMENT

VicSuper has embarked on a “pathway towards a net zero emissions portfolio” across its portfolio including equities, fixed income, real assets, and alternatives.

Date for achieving net zero emissions: While VicSuper are one of the funds most progressed in this area, they currently have no timeframe publicly attached to achieving their net-zero emissions commitment.

Funds invested: AU\$23.76 billion as at 30 June 2019

APPROACH


VicSuper are extending the measurement of carbon footprint from listed equities to other asset classes. In doing so they aim to develop a portfolio wide view of carbon emissions across equities, fixed income, property and infrastructure, as well as emissions removed by timber and agriculture investments, and reductions provided by renewable energy grid exports.

VicSuper will then seek to switch to lower carbon investments particularly for equities and fixed income and support energy efficiency measures particularly related to property and infrastructure.

CARBON EMISSIONS

As at 30 June 2019, the net total carbon emissions associated with VicSuper’s investments in listed equities, fixed income, infrastructure, property, agriculture and timber were 1,623,723 tCO₂.

These emissions have been calculated to reflect VicSuper’s share of investments using information supplied by the fund’s investment managers and asset operators.



This is the first year that emissions have been reported for asset classes other than listed equities and there has necessarily been a level of estimation and assumptions required. Notwithstanding, all data has been reported on a best endeavours basis.

VicSuper intends to expand the depth of analysis and reporting in future reporting periods.

CARBON EMISSIONS COVERED

Scope 1: Yes

Scope 2: Yes

OFFSETS


Not used, except where already purchased by an investment manager.

FINANCIAL RETURNS

VicSuper aim to reduce the carbon intensity of their portfolio without negatively impacting financial returns to members, fees or other portfolio characteristics.

Source: VicSuper

Asset owner commitment to net-zero emissions is at a similar point globally. Internationally, a handful of pension funds, including CDPQ and NY Common, have committed to achieving net-zero by 2050 and have developed an approach to achieving it. CalPERS have recently made a commitment to achieve net-zero but is yet to outline their approach.



PART 4: ASSET CLASS STRATEGIES FOR NET-ZERO EMISSIONS

While strategies targeting net-zero emissions are not new, there has been significant growth in interest over the last twelve months – mostly from Europe and across Australasia. Strategies for net-zero emissions differ across asset classes. This section highlights emerging examples of these strategies in key asset classes.

EQUITIES

The measurement of carbon emissions at the underlying portfolio holdings level is well advanced in developed market, large cap listed equities. This has been driven by companies' sustainability programs, regulatory and voluntary reporting requirements (e.g. UK mandatory GHG and environmental reporting disclosure; EU non-financial reporting directive²⁶, GRI reporting) and also by investor initiatives such as CDP. For close to two decades CDP has encouraged the largest listed companies globally to disclose their carbon footprint. Today, close to 7000 companies report their carbon footprint annually via CDP.

The availability of emissions data for large cap listed equities, combined with a number of investor initiatives such as the Montreal Carbon Pledge, the Asset Owner Disclosure Project, PRI Annual Reporting and the Task Force on Climate-related Financial Disclosures (TCFD) have led many investors to measure and report on the carbon footprint of their equities portfolios (approx. 63% in 2019)²⁷.

It has also led to many investors taking action to reduce the carbon footprint of their equities holdings by pursuing some form of 'climate aligned' equities strategy (approx. 63% in 2019)²⁸, most notably a low carbon approach.

Despite the growth in 'climate aligned' equities strategies, only a small number of equities investors are considering strategies targeting net-zero emissions, and even less have fully developed strategies with this target.

One of the few net-zero equities offerings in Australia and New Zealand is the AllianceBernstein Managed Volatility Equities—Green Strategy.


AllianceBernstein (AB) Managed Volatility Equities—Green Strategy (“Green MVE”)²⁹

COMMITMENT

The commitment covers the AllianceBernstein Green MVE strategy which is an active strategy with AU\$214.3 million invested as at 31 October 2019. The date for achieving net zero emissions was from the inception of the strategy on 19 December 2018.

APPROACH

Green MVE targets low-volatility stocks which tend to have lower emissions. The emissions associated with the AB Managed Volatility Equities (MVE) strategy, on which Green MVE is based, have been, on average, 71% lower than those of the S&P/ASX 200 Accumulation Index since MVE's inception in 2014 to 31 October 2019.



During stock selection for Green MVE, a carbon price is applied to the emissions of the underlying company, thereby favouring companies with lower emissions. By doing this, the emissions associated with the portfolio can be reduced to 90% less than those of the index. Carbon neutrality can be achieved by offsetting the remaining 10% of emissions through third-party arrangements.

CARBON EMISSIONS COVERED

Scope 1: Yes

Scope 2: Yes

Other: Emissions associated with fossil fuels that are sold to a third party for them to combust (e.g., the coal extracted and then sold by a coal miner).

OFFSETS

Yes: Tonnes CO2 offset quarterly in arrears: Approx. 1,000 (final annual emissions not yet calculated)

FINANCIAL RETURNS

Green MVE defines investment success as “green alpha” i.e. the excess returns that accrue to investors after the costs of offsetting emissions associated with the portfolio. As at 31 October 2019, returns have been in line with the benchmark, even after retiring carbon offsets. This has met the objective of helping investors to achieve neutral carbon outcomes without the need to sacrifice competitive investment returns.

Source: AllianceBernstein

An international example includes the BNP Paribas Theam Quant Europe Climate Carbon Offset Plan.

BNP Paribas Theam Quant Europe Climate Carbon Offset Plan (ECCOP)³⁰

COMMITMENT

The commitment covers the BNP Paribas Theam Quant Climate Carbon Offset Plan which is an active quant strategy with AU\$490 million (€300 million) invested as at 31 December 2019. The date for achieving net zero emissions was from the inception of the strategy on 1 March 2019. BNP Paribas Asset Management also launched a Global version of this strategy in December 2019.

APPROACH

The ECCOP strategy selects listed companies on the basis of their carbon footprint, energy transition strategy and high ESG standards.

BNP Paribas Asset Management then calculates the carbon footprint of the ECCOP at the beginning of the quarter based on average assets under management and purchases Verified Emission Reductions (VER) to offset the carbon footprint of the Plan.

CARBON EMISSIONS COVERED

Scope 1: Yes

Scope 2: Yes



OFFSETS

Yes: 100 tCO₂ for every €1m invested in the fund for 1 year, as at 31 December 2019.

FINANCIAL RETURNS

Estimated annualised cost of VER acquisition and servicing necessary to offset the carbon footprint of an investment into the fund expressed in basis points of the fund NAV: 0.12%

Source: BNP Paribas Asset Management

Both these examples of net-zero emissions strategies in listed equities use innovative investment strategies (one active and one quantitative) to achieve substantial reductions in carbon compared to the benchmark, combined with the retirement of offsets to cover residual emissions.

They also both seek to achieve net-zero emissions from inception. They therefore incur costs associated with the retirement of offsets from the outset. This differs from other asset classes where the net-zero emissions target is not achieved until some future date e.g. 2030 or beyond.

While these examples of net-zero emission strategies have the explicit aim of delivering performance as well as net-zero emissions, a challenge highlighted by listed equities managers seeking to develop net-zero strategies was the potential impact on performance. Firstly, underlying holdings have not yet achieved net-zero emissions. In the absence of a globally legislated price on carbon, underlying companies pursuing net-zero emissions may incur higher costs than competitors in the short term. Where underlying holdings have committed to net-zero emissions, it is generally over a much longer timeframe e.g. usually 2030 or 2050.

Assuming the net-zero equities strategy requires residual emissions to be offset, a further challenge highlighted will be the willingness of investors to accept 'lower'³¹ returns in that strategy due to the cost of purchasing offsets. Even where asset owners are willing to accept some reduction in returns to pay for emissions abatement, it is incumbent on them to look across their portfolio as a whole to seek least cost abatement, which may not be offsetting in the listed market.

Another challenge highlighted by listed equities managers is the diversity in demand from investors for 'climate aligned' portfolios. One example of this is investors, particularly endowment funds, that are seeking fossil fuel free portfolios rather than net-zero emissions portfolios.

Given the growing number of companies committing to net-zero by 2050 or before, it may not be long until global active managers look at developing funds comprising these companies. If all underlying portfolio holdings committed to net-zero by 2050 or before then it would seem relatively easy to commit the fund to net-zero by 2050 or before. A key question that active managers would need to address is whether such a fund could be developed within acceptable constraints e.g. tracking error, liquidity etc.



Can avoided emissions from investments in climate solutions help investors achieve net-zero?

In listed equities, as in most other asset classes, there is increasing investment in climate solutions (i.e. technology and systems to support the shift to a low carbon future). Investors in these asset classes are wanting to know if they can claim 'avoided emissions' equal to their share in these investments.

To date there has been no applicable, global methodology for the treatment of emissions avoided by climate solutions. However, efforts are now being made to develop a methodology for measuring and fairly crediting these avoided emissions along the value chain for creation of climate solutions, which can then be allocated among investors along that value chain. Australian Ethical Investments has proposed a methodology along with case studies of companies whose products or services avoid emissions generated by other parts of the economy, e.g. household insulation, bicycles, generating renewable electricity and recycling waste metals³². As outlined by Australian Ethical:

Using carbon footprinting as a single measure of climate performance is problematic because a company footprint may not capture and fairly allocate:

- *Scope 3 emissions produced by use of a company's products. For example, how should a footprint calculation allocate emissions from burning coal between the coal miner, the coal fired electricity generator and the businesses using that electricity?*
- *The climate benefits of positive products like solar panels that result in emissions reductions³³.*

Such a methodology seeks to enable investors in companies whose products or services avoid emissions, to claim a share of avoided emissions. These avoided emissions can then be used by the investor to offset emissions generated by other companies in their investment portfolio. This methodology is applicable for both equity and debt investors.



FIXED INCOME

The measurement of carbon emissions is less progressed in fixed income with only around 17% of fixed income investors having undertaken a carbon footprint of their portfolio. Because the majority of issuers are not in the listed markets and have not been subject to the same drivers, the big challenge facing fixed income investors is the availability of emissions data. However, fixed income investors can play an important role by requiring issuers to incorporate climate change information and emissions data into their documentation and the covenants of bond contracts. Even where investors don't require this, their use of industry level risk exposures as a proxy for specific issuer risk is likely to encourage greater disclosure (at least for issuers with lower risk than the industry level).

However, because of the size of the debt market and the reach of fixed income managers there is the potential to influence for improved climate outcomes. For instance, only about 40 % of the most fossil fuel intensive fuel companies globally have listed equities but all of them are in the debt market. Much of Australia's mining sector only raise money through the issuing of bonds. Therefore, it is through the bond market that investors can exert broader influence. We saw evidence of this beginning to happen at the sovereign level when, on 14 November 2019, the Swedish Central bank announced it would avoid Australian and Canadian bonds due to the 'large climate footprint'³⁴.

Although still small relative to the total market, the number of sustainability linked loans more generally, and climate bonds in particular, is rapidly increasing. Thanks to the work of the Climate Bonds Initiative (CBI), fixed income has one of the most robust methodologies for climate (or climate-aligned) investment strategies. The CBI has developed a Taxonomy identifying whether underlying assets and projects are compatible (or potentially compatible) with a 2 degree global warming target set by the Paris Agreement. Bonds are then screened against this Taxonomy to determine whether underlying assets or projects are eligible for climate finance. Use of the Taxonomy by investors has increased significantly over the last year (21% compared with 11% in 2018³⁵). However, while the CBI Taxonomy is aligned with the Paris goal of keeping the global temperature rise this century well below 2 degrees Celsius above pre-industrial levels and is a useful starting point, it has not yet evolved to identify underlying assets and projects that are compatible with net-zero emissions.

Methodologies for green bonds are set to evolve even further with the European Commission Technical Expert Group (TEG) on Sustainable Finance proposing, in mid-2019, that the Commission create a voluntary, non-legislative EU Green Bond Standard to enhance the effectiveness, transparency, comparability and credibility of the green bond market and to encourage the market participants to issue and invest in EU green bonds. The new Commission, which took office in December 2019, is in charge of deciding whether to take the TEG's recommendations forward and how.



Definitions of Net-zero Emissions For Corporate Credit And Sovereign Bonds – PIMCO³⁶

When looking at net-zero in both sovereign and corporate bonds PIMCO are assessing underlying issuers claims of net-zero and carbon performance based on a proprietary climate framework.

For corporate bonds this framework builds on a range of methodologies and tools that help assess the alignment of both sectors and issuers with scenarios compatible with the Paris Agreement, such as the Climate Bonds Initiative (CBI) Taxonomy, the Science-Based Target initiative (SBTi), or the Transition Pathways Initiative (TPI).

PIMCO engages with issuers to foster standardisation and transparency in climate reporting, as well as ambitious climate goals. For example, PIMCO encourages issuers to disclose details on the business plan alignment with the Paris Agreement (e.g. capex, R&D spending and business mix), the interim carbon targets, and mechanisms that support their long-term carbon emissions reduction goals (e.g., science-based target method, value chain approach, and specific treatment of offsets and GHG removal techniques in line with the mitigation hierarchy and IPCC findings). This analysis informs PIMCO's climate strategy that is focused on both the risks, and importantly, the opportunities associated with the transition to a net zero economy.

Source: PIMCO



REAL ESTATE

The measurement of carbon emissions at the underlying portfolio holding level is well advanced in real estate, particularly in the commercial office segment. After listed equities, real estate has the second highest percentage of investors (57%) having undertaken a carbon footprint³⁷. This has been driven by real estate specific government and industry initiatives such as the Australian Building Greenhouse Rating (ABGR), now known as NABERS Energy Rating, and the Green Building Council of Australia (GBCA) Green Star for real estate as well as broad industry initiatives such as CDP (for listed real estate companies) and real estate investment initiatives such as GRESB for property.

Real estate appears to be the asset class most progressed in terms of net-zero emissions strategies. As mentioned earlier, 43% of Australia's largest listed property companies have made commitments that closely align with the Paris Climate Agreement, aiming to achieve net-zero greenhouse emissions before 2050 for their owned and managed assets³⁸. A number of these companies are real estate investors.

One of the drivers for this has been the World Green Building Council's (WorldGBC) Advancing Net-zero project which aims to promote and support the acceleration of net-zero carbon buildings to 100% by 2050. The Advancing Net-zero project includes the Net-zero Carbon Buildings Commitment (the Commitment) which challenges organisations to achieve net-zero carbon for all buildings within their direct control by 2030, and for all buildings by 2050. The Commitment provides a framework for organisations to develop and implement solutions for their real estate portfolios to both reduce energy demand and achieve net-zero carbon emissions. Five of the 31 business and organisation signatories to the Commitment are Australian investors³⁹. In addition, a number of Australian property owners and developers have also become signatories to the Commitment.

The WorldGBC definition of a net-zero carbon building is **a building that is highly energy efficient and fully powered from on-site and/or off-site renewable energy sources**. The focus of the net-zero emissions for buildings is therefore based on a hierarchy of energy efficiency, followed by on-site renewable energy installations (e.g. rooftop solar), followed by grid sourced renewable energy. Offsets are permitted only as the final option in the renewable hierarchy to reach net-zero carbon emissions. The WorldGBC definition and hierarchy appear to be reflected in the net-zero strategies of a number of Australian real estate investors.

Other industry guidance used by investors includes the GBCA Carbon Positive Roadmap and the National Carbon Offset Standard for Buildings.

Another key driver is asset owners requiring their property fund managers' portfolios to be net-zero emissions by specified dates. For example, Cbus, Australia's leading building and construction industry super fund, set a target for all its property holdings to be net-zero by 2030. Cbus currently holds around AU\$5 billion of property through its flagship Cbus Property subsidiary and property fund managers such as ISPT and AMP. Conservative estimates suggest that Cbus could hold more than AU\$10 billion in property by 2030. Property fund managers will be given until the end of this year to outline their roadmaps for achieving net-zero by 2030.



AMP Capital Real Estate (AMPCRE) Portfolio⁴⁰

COMMITMENT

AMP Capital's Real Estate business has committed to zero emissions for the portion of the real estate assets that they own and operate.

Date for achieving net zero commitment: 2030

Dollars covered by commitment: Approximately AU\$28 billion (as at 30 June 2019)

APPROACH

Each year from 2030, AMP Capital will calculate the carbon emissions from the portfolio of owned and operated properties over the course of a year; then will undertake actions that reduce or compensate for that level of emissions, bringing the balance to zero including:

- Energy efficiency
- On-site renewable energy installations (e.g. rooftop solar) where feasible
- Grid sourced renewable energy
- Offsets for remaining residual emissions (e.g. from refrigerants, gas boilers and diesel generators)

PROPERTIES COVERED

All AMP Capital owned and operated properties.

CARBON EMISSIONS COVERED

Scope 1: Yes (base building only)

Scope 2: Yes (base building only)

Other: Nil

OFFSETS

Yes: To cover residual emissions, estimated to be 9,572 tCO₂e, from 2030.

INVESTMENT RETURNS


AMP Capital's Real Estate Sustainability Team believe the portfolio can achieve net zero emissions by 2030 in a manner that is not detrimental to asset performance or investment returns.

Source: AMP Capital

Commercial buildings managed by Dexu Group⁴¹

COMMITMENT

Dexu has committed to achieve a net zero position for all carbon emissions associated with their managed property portfolio by 2030. This comprises all emissions sources within its operational control, including upstream and downstream emissions. Dexu has also committed to sourcing 100% of its electricity needs from renewable sources by 2030.



Further to this commitment, Dexus has certified its net zero emissions goal as a Science Based Target via the Science Based Target Initiative (SBTi) as being aligned with a 1.5 degrees Celsius warming outcome. Through its SBT, Dexus commits to reduce absolute scope 1 and 2 GHG emissions 70% and absolute scope 3 emissions 25% by 2030 from a 2018 base year.

Date for achieving net zero commitment: 2030.

Dollars covered by commitment: AU\$31.8 billion or 100% of total funds under management (at 30 June 2019).

APPROACH

Dexus plans to achieve net-zero emissions through:

- Improving energy efficiency through continued focus on operational excellence, leveraging emerging technology, building retrofits, enhanced sensors and artificial intelligence (equal to 39% of projected BAU emissions)
- Increasing renewable energy use from on-site and off-site sources (equal to 42% of projected BAU emissions)
- Electrification of buildings where feasible, targeting the removal of fossil fuels (equal to 3% of projected BAU emissions)
- Reducing emissions from waste, water and refrigerants (equal to 7% of projected BAU emissions)
- Offsetting for remaining residual emissions (equal to 9% of projected BAU emissions).

PROPERTIES COVERED

All Dexus managed properties.

CARBON EMISSIONS COVERED

Scope 1: Yes (base building only)

Scope 2: Yes (base building only)

Scope 3: Yes (base building only).

SCIENCE-BASED TARGET EMISSIONS COVERED

Scope 1: Yes (base building only)

Scope 2: Yes (base building only)

Scope 3: Yes (base building sources plus tenant electricity and indirectly managed properties where Dexus or one of its Third Party Funds Management partner has a financial interest).

As at 30 June 2019, the amount of Scope 1, 2 and 3 emissions associated with base building activities for all managed properties is 170,796 tCO₂.

OFFSETS


Net Zero commitment: Yes: To cover residual emissions from 2030

SBT: No

INVESTMENT RETURNS

At this time Dexus are unable to provide an exact quantification of the costs and savings associated with their commitment to net zero emissions by 2030.

Source: Dexus Group



While there is a degree of consistency between the strategies and approaches of real estate investors, there are still some areas of differentiation.

Different strategies have different coverage in relation to properties or emissions included in the net-zero emission commitment. For example, while the initial focus of investors such as AMP is on achieving net-zero emissions for buildings within the direct control of an organisation, the GPT Group has extended its commitment beyond the properties it owns and manages to all buildings in which it has an ownership interest, including buildings it co-owns or does not manage.

Different strategies also have different degrees of emissions reduction before offsetting. For example, based on indicative numbers, the AMPCRE Portfolio aims to deliver emissions reductions from energy efficiency and the use of renewable energy of 96% of emissions, before seeking to offset residual emissions. The only residual emissions to be offset are expected to be some minor scope 1 emissions from refrigerants, gas boilers and diesel generators.

Further, while most real estate investors are targeting net-zero, property developer Mirvac has pledged to be “net positive” by 2030. This means the company aims to go beyond net-zero, reducing emissions by more than its operations emit. Mirvac has also established an energy company to install rooftop solar on their commercial buildings and is selling power to occupants, among other initiatives.

Unlike listed equities where there is an immediate cost associated with purchasing offsets to achieve net-zero emissions, real estate investors do not see net-zero emissions strategies as having a negative impact on financial returns, rather they anticipate multiple benefits from their action, including reduced operating costs, better health and productivity for occupants, and increased sales prices, rents and occupancy rates.

The next frontier for real estate will be addressing net-zero in its construction supply chain with commitments for net-zero to include embodied energy. As mentioned earlier, the ETC has outlined possible routes to fully decarbonize products such as plastics, cement and steel. They have produced detailed papers in each of these areas⁴². The Energy Transition Hub, an Australian-German innovation partnership, is also progressing work in this area. In particular, research in Theme IV: Creating industrial and export opportunities, unlocks the vast potential for innovation in harnessing renewable energy sources for the entire value chain — from mining through to energy-intensive industrial activities — in the form of solar photovoltaic (PV), wind and concentrated solar thermal technology for high-temperature processes such as metals and concrete production⁴³.



AGRICULTURE AND FORESTRY

While farming and land use changes are significant contributors to greenhouse gas emissions, the agriculture and forestry sectors are uniquely placed to contribute to net-zero emissions strategies through their ability to remove large quantities of carbon dioxide from the atmosphere by storing it in healthy soil and growing plants and trees.

According to the IPCC, all pathways to achieve 1.5 degrees Celsius require carbon removals. Even with the primary focus on the hierarchy of emissions reductions, removing carbon from the atmosphere will be necessary to compensate for emissions from sectors in which emissions reduction and reaching zero emissions is more difficult (e.g. not yet technologically or commercially viable), such as aviation and industrial processes.

Forestry investments can contribute to net-zero and net negative emissions through:

1. Halting deforestation and enabling the conservation of existing natural forest stocks
2. Sustainable forest management practices, including enhancing the productivity of forests (e.g. better planting practices, species selection);
3. Reforestation and the establishment of new forests
4. The production of carbon negative materials from timber that are used in a wide array of value chains.

New Forests⁴⁴

COMMITMENT

In November 2019, New Forests committed to net-zero emissions as an investment manager.


Date for achieving net-zero commitment: Varies for each fund (as forestry fund inception dates vary).

Dollars covered by commitment: AU\$5.4 billion (100% of total assets under management).

APPROACH

Each year New Forests calculate the total increase in the carbon emissions stored in standing production forests (e.g. 9.5 MtCO₂ for FY18⁴⁵). They undertake a range of actions that increase the negative emissions associated with the forests including:

1. Establishment of new plantations on bare or degraded land (currently being undertaking in New Zealand and Indonesia).
2. Improved forest management that increases the carbon stored in the trees, including extending the rotation age of existing production forests, so that the forest stores a greater amount of carbon, while enabling logs to grow to larger, more valuable log grades (currently being undertaking in the United States, Malaysia and Laos).

- 
3. Switching to timber species that have longer rotation ages, meaning larger trees on site can store a greater amount of carbon on average over time (currently being undertaken in Australia).

New Forests also report on the carbon offsets issued by each fund. The firm is developing an expanded set of carbon removals/emissions reporting to better align forestry climate reports with comparable data from other asset classes. (e.g. 4.5 million tonnes of offsets issued for FY18).

CARBON EMISSIONS COVERED

Carbon is stored in the production area of each forest, with measurements reported in carbon dioxide equivalent units (CO₂e). This means that when timber is harvested and sold, the carbon that remains stored in this timber is removed from the forest-level carbon accounting. This is likely to underestimate the carbon stored as much of the timber goes on to be used in durable wood products (and therefore continue to store the carbon).

Currently, New Forests do not include emissions from operational activities associated with the management of the forests. This would include fuel use for vehicle fleets, harvesting, and haul equipment as well as emissions associated with chemical fertilisers and pesticides. These total emissions are considered immaterial as compared to the forest carbon stock, and their exclusion is more than offset by the exclusion of the carbon in durable wood products. However, New Forests anticipate accounting for these emissions and including them in the net emissions methodology in the future.

OFFSETS


The various forestry funds are carbon negative and so do not have residual emissions to offset. Some New Forests funds are sellers of carbon offsets.

INVESTMENT RETURNS

Any actions to increase the stored carbon in forestry are associated with growth in the forest, and therefore are inherently linked with positive investment value. In addition, the monetisation of the carbon sequestration and storage value of forests, through the sale of carbon credits through the various schemes including the Emissions Reduction Fund⁴⁶, the Carbon Farming Initiative⁴⁷, the New Zealand Emissions Trading Scheme⁴⁸ and the California carbon market⁴⁹ is additive to returns.

The costs incurred for management and monitoring of climate impact are incidental, except in the case where formal carbon projects are developed. Project development, verification, and monitoring costs can range from the tens of thousands to hundreds of thousands of dollars, depending on the regulatory requirements and scale of the project. However, these costs are offset by the revenue from the monetisation of credits.

One of the challenges of net-zero emissions commitments in the agriculture and forestry sectors is that the carbon removals from these activities are not included in current carbon footprint methodologies⁵⁰ used in other sectors (for companies or assets). Historically, a few forestry and agriculture investment managers are still using Forest Industry Carbon Assessment Tool which was developed based on the Greenhouse Gas Protocol developed by WRI and WBCSD, however, this tool is no



longer generally available. As a result, some of these managers are now developing their own methodologies for calculating carbon stored in their forestry assets.

The differing rules for carbon offset accounting across programs and jurisdictions adds another layer of complexity. For example, the different inclusions (e.g. whole trees only compared to whole trees, plus roots plus leaf litter) leads to different volumes of carbon credits being generated.

Recently, the World Business Council for Sustainable Development (WBCSD) together with the World Resources Institute, has announced a plan to update the GHG Protocol Scope 3 Value Chain Guidance to include emissions and removals from land use and land use change. This guidance is anticipated to be used by companies both that have forestry and agriculture in their core operations as well as companies seeking to achieve their own emissions reduction targets using nature-based climate solutions (NCS). As guidance develops for corporate NCS accounting practices, this may support investors in developing methodologies for net-zero emissions strategies in forestry and agriculture.

Can carbon removal in agriculture and forestry help investors to be net-zero?

Firstly, it is important to note that not all agricultural or forestry assets or funds will achieve a net increase in stored carbon in any given year. For example, in forestry, where the harvesting of timber is greater than the growth in timber the amount of stored carbon in the forest will decline.

Where agricultural or forestry assets or funds are net negative (because stored carbon increases and there are no offset schemes in place⁵¹ OR offsets sold are less than the increases in stored emissions), investors can claim the net negative position associated with their investment in the fund (in line with their portion of ownership in the fund). However, currently there is no universal system through which formal carbon rights or units would transfer or be retired, and investors would need to clearly account for the carbon.

However, for agricultural or forestry assets that achieve a net increase in stored carbon in any given year AND that participate in carbon markets in relation to the increase in stored carbon, only the end-purchaser of those carbon offsets can claim the associated carbon offset or there is a risk of double-counting the emissions reduction. Therefore, investors in these assets must decide if they will purchase (and retire) carbon offsets from the agriculture or forestry asset to offset emissions from other parts of their portfolio or whether these offsets will be available for sale to other stakeholders.

At a minimum, sophisticated investors with 'climate aligned' strategies should be asking their agriculture and forestry investment managers to report on changes in stored carbon associated with their fund. Where investors intend to have agriculture and forestry contribute to a net-zero target, they should engage with their managers to encourage climate-smart practices that increase carbon removals. Furthermore, until such time as updated guidance for agriculture and forestry greenhouse accounting is available, they should also clearly explain their decisions on how any increases in stored carbon will be treated in their definition of net-zero emissions.



INFRASTRUCTURE

Cities consume over two-thirds of the world's energy and account for more than 70% of global carbon emissions, and infrastructure assets are a major contributor to this. Infrastructure investors are relatively less advanced than real estate or listed equities when it comes to measuring carbon emissions at the underlying asset level, with less than a third having undertaken a carbon footprint⁵². There does not yet appear to be the same level of initiatives driving and supporting the calculation and reporting of carbon footprints as in some other asset classes. Infrastructure does not have the same mandatory government and industry minimum energy efficiency requirements that are in place for real estate. Green rating schemes and initiatives such asGRESB for Infrastructure are also relatively new.

Infrastructure is characterised by divergent assets across transport, telecommunications, energy, water and social infrastructure, many of these with unique challenges to achieving net-zero emissions. A large proportion of infrastructure assets including roads and airports have a relatively small carbon footprint from the construction and operation of these assets⁵³, but much larger footprint from the actual use⁵⁴ of infrastructure and the patterns of behaviour it reinforces, such as the cars and trucks driving on roads, or passengers travelling through airports. Net-zero is a bigger challenge for these assets. Other assets such as renewable energy infrastructure, have a near zero footprint from the actual use of the infrastructure and potentially result in emissions being avoided.

Perhaps even more than other asset classes, infrastructure needs to take a holistic approach to climate change risks and opportunities. Net-zero in infrastructure, needs to be part of an integrated infrastructure planning outlook: e.g. what are the climate adaptation and resilience considerations required when investing in urban, local or regional infrastructure? Net-zero in infrastructure is best achieved at the design stage so emissions reductions can be incorporated at the system level (e.g. in Australia the transport decarbonisation challenge is, inter alia, to enable the expected growth in electric vehicles by providing charging points, encouraging alternative modes of transport, planning for regional rail freight and smart city analytics).

While the Infrastructure Sustainability Council of Australia (ISCA) is taking action in support of net-zero, the focus from the infrastructure sector globally does not appear to be as strong or concerted as in the real estate sector.

However, leading Australian or New Zealand infrastructure investors are undertaking the steps that are the precursor to developing a net-zero target, including defining the scope of carbon emissions for their assets and/or funds, calculating the carbon footprint, identifying emissions reduction strategies and approaches to be implemented and the timeframe over which they will be implemented. Some of these investors have gone as far as setting emissions reduction targets for their funds, but at this time there does not appear to be any that have made commitments to achieving net-zero by 2050.

Asset owners such as Cbus, are also seeking to influence net-zero emission commitments by the infrastructure managers in which they invest. Further, there are a handful of individual infrastructures assets embracing a net-zero emissions target.



Sunshine Coast Airport⁵⁵

Sunshine Coast Airport, owned by Palisade Investment Partners, has achieved carbon neutrality under the Airport Carbon Accreditation program. Airport Carbon Accreditation is a program of the Airports Council International (ACI) and is the only institutionally-endorsed carbon management program for airports. The program is the only airport specific carbon standard which relies on internationally recognised methodologies. To date, Sunshine Coast Airport has introduced initiatives that have delivered a 24% reduction in Scope 1 and 2 carbon emissions, 9% reduction in electricity consumption per passenger and an 11% reduction in waste to landfill per passenger⁵⁶.

Source: Palisade Investment Partners

Can avoided carbon from renewable energy infrastructure help investors to achieve net-zero?

According to Australian government estimates, approximately one-third of Australia's net emissions are from electricity⁵⁷. Many infrastructure investors are actively pursuing investment in renewable energy due to its importance in reducing these emissions and contributing to meeting the Paris targets.

However, as discussed earlier, a challenge for investors in climate solutions such as renewable energy infrastructure investors is the lack of an applicable, global methodology for the treatment of emissions avoided in the carbon footprint measurement and reporting, and therefore in the determination of net-zero, by investors.

Renewable energy funds generally have a relatively small carbon footprint from the construction and operation of these assets⁵⁸ and a near zero carbon footprint from the actual use⁵⁹ of electricity by the end user. These assets avoid carbon emissions being produced where the electricity generated from renewable resources replaces energy generated from fossil fuels.

For example, the seed assets in Impact Investment Group's Solar Asset Fund will avoid over 4.1 MtCO₂e emissions over the life of assets⁶⁰.

It's not clear if and how investors in renewable energy funds can use investments in these funds to offset their own emissions. Some questions need to be answered including:

- How can it be determined that the electricity generated from renewable resources is actually replacing energy generated from fossil fuels, and therefore resulting in avoiding emissions, i.e. is it necessary to see emissions from electricity generated from fossil fuels go down?
- If the greenhouse gas emission factors used to calculate carbon footprint already take renewable energy into account, does reducing an investor's carbon footprint by the amount of the 'avoided emissions' result in double counting of these avoided emissions?

PRIVATE EQUITY

The measurement of carbon emissions at the underlying portfolio holding level is least progressed in private equity with no investors having undertaken a carbon footprint⁶¹. We were unable to find any private equity investors that had set a net-zero emissions target for their private equity portfolios.

INVESTOR ORGANISATIONAL NET-ZERO

While the largest risks and opportunities associated with climate change sit within the investment portfolio, a number of investors have nonetheless sought to achieve net-zero emissions for their operations (more generally known outside the investment sector as carbon neutrality). HESTA, Cbus and Dexus have been certified carbon neutral under the National Carbon Offset Standard (NCOS), while other investors have become, or are in the process of becoming, carbon neutral but have not sought certification including VicSuper, Schroders and AllianceBernstein. This trend towards being carbon neutral for operational emissions is likely to continue.

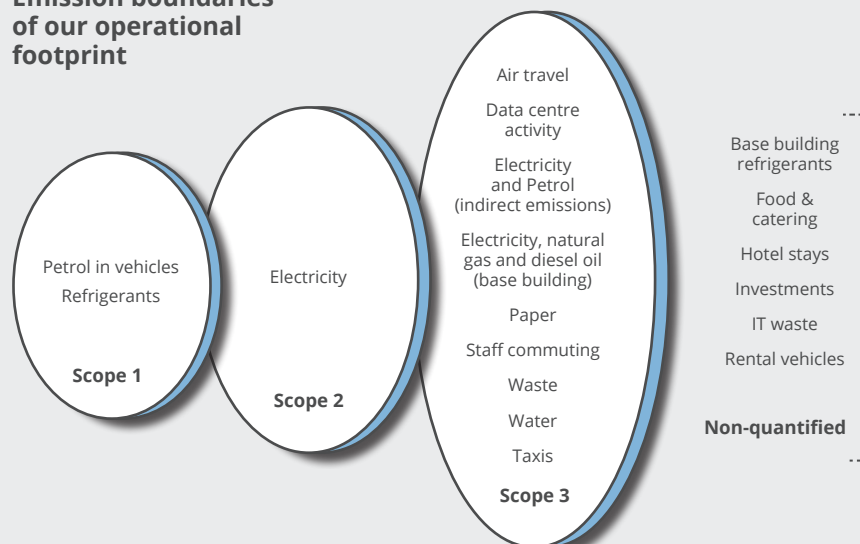
HESTA⁶²

In 2019, HESTA became the first stand-alone super fund to be certified as carbon neutral under NCOS for its Trustee operations ('operations'). The carbon neutral certification covers all operations excluding HESTA's investments.

CARBON EMISSIONS COVERED

The diagram below provides a summary of the emissions covered under HESTA's certification boundary and includes the Trustee's business operation, activities within the HESTA leased office spaces across Australia and IT data centres.

Emission boundaries of our operational footprint





HESTA'S CARBON FOOTPRINT

HESTA's carbon emissions for the financial year 2019 were 1,795.54 tCO₂e. This was a 24.24% increase on the previous year, mainly due to a growth in headcount of 25.77% over the same period. In the reporting period green power was purchased equivalent to 6.06 tCO₂e which reduced the carbon footprint to 1,789.47 tCO₂e.

APPROACH TO MANAGING AND REDUCING CARBON EMISSIONS

HESTA's emissions reduction strategy covers waste, water and energy management, and the examination and re-engineering of business processes to ensure these processes are sustainable. Key initiatives taken in the 2019 financial year to reduce emissions included:

- Revising the Office Fit out Design Guidelines to design efficient and productive offices and to provide the framework for employees to be sustainable.
- Upgrading Perth, Brisbane and Hobart offices
- Improving lighting controls
- Introducing an energy education program
- Improving labelling and signage of waste streams.

OFFSETS – QUANTITY AND TYPE

HESTA purchases and retires offsets for the emissions remaining after emissions reduction. For the financial year 2019, HESTA purchased and retired 1796 offsets. From the various available offsets, HESTA selected specific projects that provided co-benefits e.g. benefits to indigenous or local communities.



**PART 5:
CHALLENGES
AND BARRIERS
TO NET-ZERO**

Asset owners and asset managers that have committed, or are in the process of committing to net-zero targets, refer to a range of challenges in doing so. Some of these challenges have already been outlined in the report. The three biggest challenges and areas for further work or clarification are described in more detail here.

DOES NET-ZERO EQUAL PARIS ALIGNED?

Initially there were ‘climate aligned’ investment strategies. These strategies had a range of targets associated with moving the economy towards lower carbon. Then there were ‘Paris aligned’ strategies that were specifically designed to meet the objectives of the Paris Agreement. Tools such as the SBTi, and the CBI Taxonomy, have been developed to align to the Paris goal of keeping global temperature increases below 2 degrees.


However, these ‘Paris aligned’ targets did not explicitly link the temperature increases with actual emissions in the economy, which is the element over which investors potentially have some influence. It was then the United Nations Intergovernmental Panel on Climate Change (IPCC) showed that in order to stand a reasonable chance of achieving the Paris goal of keeping global temperature increases below two degrees, global carbon dioxide emissions needed to be net-zero by 2050. This has led to broad recognition that the target of net-zero emissions by 2050 is what is required to achieve the Paris goal.

However, it is not universally accepted that the target of achieving zero emissions by 2050 is aligned with keeping global temperature increases below 2 degrees. Some investors hold the view that the cause of misalignment is the current lack of specificity around the pathway for achieving net-zero (e.g. is it Paris aligned if emissions reductions are not achieved until closer to 2050) and use of carbon offsets particularly in some sectors. The use of offsets is discussed in more detail below.

LACK OF METHODOLOGIES

At present, there is not yet a globally agreed methodology for defining what being net-zero by 2050 means for an asset owner or asset manager. This aims to be addressed by the investor alliances being established, including the Asset Owner Alliance and the IIGCC Paris Aligned Working Group. As seen throughout the sections of this report, while there is generally a lack of methodology, there is considerably more guidance in some asset classes than others, with real estate and listed equities appearing to be the most advanced.

There is emerging guidance in some asset classes, for example, 2 degree climate scenario analyses at portfolio level, on which net-zero emissions strategies and their respective timeframes will hinge are now becoming available to investors. However, there is still a long way to go towards addressing all the methodological questions across all asset classes.



Related to the lack of methodology is the wide variance in the emissions covered by investors' commitments to net-zero emissions. No investor has net-zero targets which comprehensively cover all their emissions including those from along the entire value chain of their investments. This leaves significant opportunity for investors to strengthen their commitments towards net-zero emissions. This requires targets which address the full scope of direct and indirect emissions within each company's influence, supported by detailed plans to achieve this.

The Offsets Dilemma

Carbon markets have been operating in Australia and New Zealand for more than a decade and are seen by many across the economy as an important tool for achieving least cost abatement. Achieving least cost abatement implies that abatement be delivered by the producer of the emissions up until the point at which abatement by the producer is more costly than abatement that can be achieved in another part of the economy, at this point the producer of the emissions purchases and retires carbon offsets. At least in the corporate sector, there is a view that offsets have demonstrated their contribution to sound decarbonisation strategies.


Further, using offsets is seen by some as playing an important role in the development of a carbon price and encouraging behaviours which capture and sequester greenhouse gases (where the cost to do so is less than the cost that would be incurred by the producer of the emissions). In this way, carbon offsets can stimulate real economy outcomes.

However, there appears to be very little discussion by investors of least cost abatement. While some investors support the use of offsets, many of these investors only support it as a last resort and only for a portion of residual emissions left after all emissions reduction opportunities have been exhausted. Notwithstanding, there does not appear to be any consensus as to how much residual emissions is acceptable to offset and how much is not.

Moreover, some investors seem to be sceptical about any use of offsets as part of a strategy to achieve a net-zero target.

Some of the scepticism seems to be philosophical. For example, there is a question about whether offsets send the right message and whether they are actually a 'permit to pollute', allowing businesses to keep doing what they are doing i.e. the continuation of business as usual.

Some of the scepticism seems to be based on differing views as to whether offsets operate effectively as a market mechanism to achieve least cost abatement. These concerns are partly due to the absence of a global trading platform for offsets which would allow the market for offsets to operate efficiently. In the absence of a global trading platform the price of offsets does not reflect market price of abatement. This leads to concerns that if the price does not move efficiently, causing either oversupply



of offsets and nothing changes or whether there will be under supply and it becomes impossible to buy offsets.

Some of the scepticism seems to be associated with the robustness and credibility of offsets. Indeed, there are various offset schemes of various standards across a range of jurisdictions. Some are more credible than others. There are different views about offsets depending on whether they are market based, technology based or nature based. However, there is some agreement that there are challenges and barriers to all of them. Some market distrust has ensued from the need of regulatory oversight to ensure the credibility, additionality and the avoidance of double counting risk.

To address issues of credibility and robustness there is ongoing evolution in the methodologies for carbon offset schemes. For example, historically, forest offsets were not considered permanent. In more recent methodologies, permanence is now confirmed (80% of total timber due to it being locked up in end of use products).

A further question was raised about the use of offsets and whether their purchase aligns with investors' fiduciary responsibilities because it diverts money that would have otherwise have been returned to members to emissions abatement, generally outside the investment portfolio. Relevantly, in the SIS Act duties are often interpreted as being confined to the pursuit of members' financial benefits at the end of their working life. Within that framing, an argument may be raised that the purchase of offsets by a fund, if and to the extent that the purchase is directed towards the achievement of irrelevant, extraneous 'ethical' interests that may adversely impact on the financial benefit of members, would not be consistent with their duty. However, it is also well established that a fund can respond to 'best interests' indicated by the investment preferences of the members themselves. Accordingly, it is less likely that the purchase of offsets could be seen as contrary to the sole purpose test where a fund has reasonably ascertained that such purchase is consistent with the preferences of their members as a whole. That will, of course, be a matter for specific advice in each case.



PART 6: CONCLUSION

In recent years there has been growing awareness that to meet the Paris goal of keeping global temperature increases to well below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius, global carbon dioxide emissions will need to be net-zero by 2050. This has led to a range of governments, companies and investors developing 'net-zero' commitments.


For investors, progress toward net-zero emission strategies differs across asset classes with property and listed equities being the most advanced. There has been more limited progress toward net-zero in fixed income and infrastructure and, as yet, no apparent progress in private equity. The differentiated progress is due to a number of factors including the availability of support and guidance for net-zero emissions from industry bodies, the ease and progress of carbon footprinting, the ease of achieving emissions reductions (e.g. listed equities investors achieved considerable emissions reductions through their investment processes, infrastructure managers face challenges reducing emissions from the use of their assets), the size of residual emissions and the cost of offsetting.

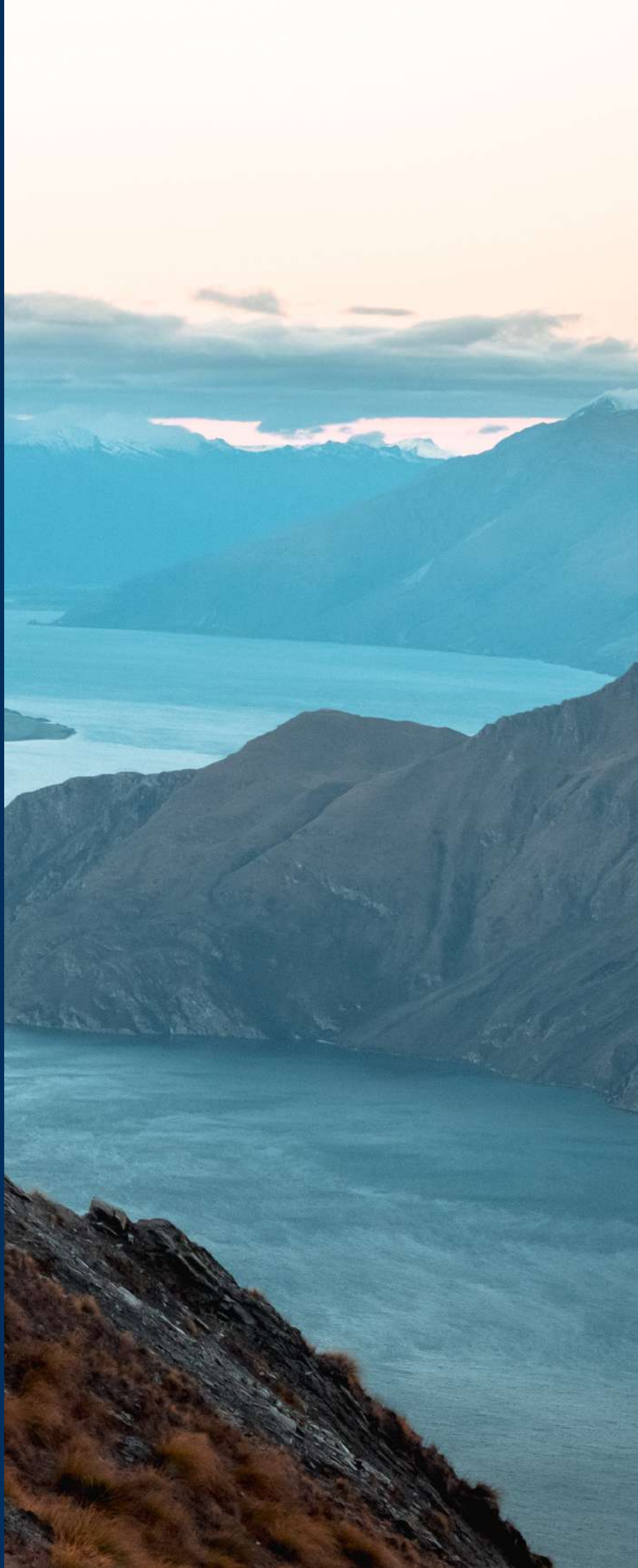
While there is currently no applicable global definition of net-zero emissions in any asset class, the case studies presented in this report demonstrate that this has not stopped leading investors from pursuing such a target. These investors have developed their own definition and methodology for net-zero including determining the timeframe for achievement of the target, the scope of emissions covered, strategies to reduce emissions and purchase and retirements of offsets. As a result, the definitions of net-zero emissions and methodologies for achieving net-zero currently differ between managers, within an asset class, as well as across asset classes. The lack of definitions and methodologies remains a key challenge to investors committing to net-zero emission strategies.

It is expected that standards and guidance on definitions and methodologies will emerge, supported by the efforts of initiatives such as The Investor Agenda, the Net-zero Asset Owner Alliance, the IIGCC Paris Aligned Investment Initiative and other asset class specific groups and initiatives. To ensure that net-zero emission strategies are to grow and continue to be seen as a credible contribution to achieving the Paris goal, specific attention will need to be given to standards and guidance relating to offsets.

REFERENCES

1. 90% and 97% respectively, IGCC Accelerating Change: Capital Growth in climate Solutions, <https://igcc.org.au/wp-content/uploads/2016/04/Accelerating-Change-web-1.pdf>, Page 11
2. Raising the Bar, Science Based Targets, sciencebasedtargets.org
3. Task Force on Climate-related Financial Disclosures, www.fsb-tcdf.org
4. Transition Pathway Initiative tool, www.transitionpathwayinitiative.org
5. Climate Action 100+, www.climateaction100.org
6. The Investor Agenda, <https://theinvestoragenda.org/>
7. Aligning financial markets with climate goals, <https://2degrees-investing.org/investor-energy-climate-action-toolkit-invecat/>
8. IPCC Special Report on Global Warming of 1.5°C, <https://www.ipcc.ch/2018/10/08/summary-for-policy-makers-of-ipcc-special-report-on-global-warming-of-1-5c-approved-by-governments/>
9. Energy & Climate Intelligence Unit Net-zero Tracker, <https://eciu.net/netzerotracker>
10. The Australian Capital Territory have set targets to achieve net-zero emissions by 2045
11. September 2019, UN Climate Summit
12. November 2019, TPI Only 1 in 10 of the world's largest energy companies have made plans to get to net-zero emissions, <https://www.transitionpathwayinitiative.org/tpi/publications/27?type=NewsArticle>
13. Energy Transitions Commission, <http://www.energy-transitions.org/mission-possible>
14. <https://www.qantasnewsroom.com.au/media-releases/qantas-group-to-slash-carbon-emissions/>
15. Energy Transitions Commission, <http://www.energy-transitions.org/mission-possible>
16. World Economic Forum Mission Possible Platform, <https://www.weforum.org/mission-possible>
17. IGCC Accelerating Change: Capital Growth in Climate Solutions, <https://igcc.org.au/wp-content/uploads/2016/04/Accelerating-Change-web-1.pdf>, page 19
18. <https://www.unepfi.org/climate-change/united-nations-convened-net-zero-asset-owner-alliance/>
19. Including SBT, CA100+, Investor Agenda, TCFD, TPI, IIGCC, WEF Mission Possible
20. IIGCC Paris Aligned Investment Initiative, <https://www.iigcc.org/resource/iigcc-paris-aligned-investment-initiative/>
21. IGCC Policies for a Resilient Net-zero Emissions Economy, https://igcc.org.au/wp-content/uploads/2016/04/Policies-for-a-resilient-economy_FINALa.pdf
22. IGCC in 2022: Investing for a Climate Resilient Net-zero Emissions Economy, <https://igcc.org.au/wp-content/uploads/2016/04/IGCC-in-2022-investing-for-climate-resilient-net-zero-emissions-economy.pdf>
23. 75% of managers responded that 25% or less of their investor clients required climate related obligations to be integrated into their investment mandates
24. Source: Australian Ethical Investment
25. Source: Vicsuper
26. OECD and CDSB, Climate Change Disclosure in G20 Countries
27. IGCC Accelerating Change: Capital Growth in Climate Solutions, <https://igcc.org.au/wp-content/uploads/2016/04/Accelerating-Change-web-1.pdf>, page 7
28. IGCC Accelerating Change: Capital Growth in Climate Solutions, <https://igcc.org.au/wp-content/uploads/2016/04/Accelerating-Change-web-1.pdf>, page 13
29. Source: AllianceBernstein
30. Source: BNP Paribas
31. 'Lower relative to returns that would be delivered if the strategy did not retire offsets (not relative to benchmark returns or returns of other portfolios)
32. Australian Ethical Investment 2016 Emissions Crediting Project, <https://www.australianethical.com.au/globalassets/pdf-files/news-investing-for-a-safe-climate-avoidedemissions.pdf>
33. Australian Ethical Investment 2016 Emissions Crediting Project – Summary of Issues and Results <https://www.australianethical.com.au/globalassets/pdf-files/news-investing-for-a-safe-climate-avoidedemissions.pdf>, page 1
34. Riksbank dumps Canadian and Australian debt in green push, Financial Times, <https://www.ft.com/content/076e9978-06c2-11ea-9afa-d9e2401fa7ca>
35. IGCC Accelerating Change: Capital Growth in Climate Solutions, <https://igcc.org.au/wp-content/uploads/2016/04/Accelerating-Change-web-1.pdf>, page 6
36. Source: PIMCO

- 
37. IGCC Accelerating Change: Capital Growth in Climate Solutions, <https://igcc.org.au/wp-content/uploads/2016/04/Accelerating-Change-web-1.pdf>, page 7
 38. ClimateWorks, Net-zero Momentum Tracker, <https://www.climateworksaustralia.org/project/net-zero-momentum-tracker/>
 39. AMP Capital Wholesale Office Portfolio, Cbus Property, Dexus, GPT Wholesale Office Fund, Local Government Super
 40. Source: AMP Capital
 41. Source: Dexus Group
 42. Energy Transitions Commission, Mission Possible, http://www.energy-transitions.org/sites/default/files/ETC%20sectoral%20focus%20-%20Plastics_final.pdf, http://www.energy-transitions.org/sites/default/files/ETC%20sectoral%20focus%20-%20Cement_final.pdf, http://www.energy-transitions.org/sites/default/files/ETC%20sectoral%20focus%20-%20Steel_final.pdf
 43. Energy Transition Hub, <https://www.energy-transition-hub.org/projects/theme-iv-creating-industrial-and-export-opportunities>
 44. Source: New Forests
 45. This figure includes the impact of new acquisitions in the portfolio, which contributed to the increase in total carbon stock.
 46. Australian Government, Department of the Environment and Energy. The Emissions Reduction Fund is the centrepiece of the Australian Government's policy suite to reduce emissions. The Fund supports projects to reduce emissions, allowing businesses, local councils, state governments, land managers and others to earn Australian carbon credit units.
 47. <https://www.agriculture.gov.au/water/policy/carbon-farming-initiative>
 48. <https://www.mfe.govt.nz/climate-change/new-zealand-emissions-trading-scheme/about-nz-ets>
 49. <https://www3.arb.ca.gov/cc/capandtrade/capandtrade.htm>
 50. Such as the WBCSD Greenhouse Gas Protocol. For more information see <https://www.ghgprotocol.org/>
 51. This is the case for the large majority of agriculture and forestry assets.
 52. IGCC Accelerating Change: Capital Growth in Climate Solutions, <https://igcc.org.au/wp-content/uploads/2016/04/Accelerating-Change-web-1.pdf>, page 7
 53. Direct (scope 1) and indirect (scope 2) emissions
 54. Indirect (scope 3 emissions)
 55. Source: Sunshine Coast Airport
 56. <https://www.sunshinecoastairport.com.au/corporate/community/environment/>
 57. 2018. Australia's Rising Greenhouse Gas Emissions. Climate Council of Australia. p. 5.
 58. Direct (scope 1) and indirect (scope 2) emissions
 59. Indirect (scope 3 emissions)
 60. Impact Investment Group's Solar Asset Fund, <https://www.impact-group.com.au/funds/iig-solar-asset-fund/>
 61. IGCC Accelerating Change: Capital Growth in Climate Solutions, <https://igcc.org.au/wp-content/uploads/2016/04/Accelerating-Change-web-1.pdf>, page 7
 62. Source: HESTA



www.igcc.org.au
secretariat@igcc.org.au
secretaria@igcc.org.au