



PORTFOLIO INVESTMENT IN A CARBON CONSTRAINED WORLD:

THE THIRD ANNUAL PROGRESS REPORT OF

THE PORTFOLIO DECARBONIZATION COALITION



DECEMBER, 2017

CONTENTS

Acknowledgements	3
Foreword	4
Executive Summary	6
Introduction: Setting the Scene	9
What are the Motivations for Portfolio Decarbonization?	12
What Targets are Investors Setting for Portfolio Decarbonization?	14
What Portfolio Decarbonization Strategies Do Investors Use?	17
How Do Investors Measure Progress?	20
What are the Financial and Environmental Impacts of Portfolio Decarbonization?	24
Making Progress	27

About this Report

This is PDC's third annual report.¹ It describes the progress that PDC signatories have made in their decarbonization efforts over the past year, looking at their decarbonization approaches and strategies and the outcomes that have been achieved. The report has been informed by a survey of PDC signatories, completed during the period August to October 2017. The survey gathered the views of signatories on their approaches to portfolio decarbonization, the outcomes they have achieved, and the key challenges they have encountered. In total, 26 of PDC's 28 signatories responded to the survey.

1. The previous reports can be found at <http://www.unepfi.org/fileadmin/documents/FromDisclosureToAction.pdf> (2015) and <http://www.unepfi.org/wordpress/wp-content/uploads/2016/11/PDCreport2016.pdf> (2016).

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We would also like to thank the 28 PDC signatories for providing the case-studies, data and materials that form the basis of this report.



The Portfolio Decarbonization Coalition

The Portfolio Decarbonization Coalition (PDC) is a multi-stakeholder initiative that seeks to support and catalyse the transition to a low-carbon economy by encouraging and mobilising institutional investors to decarbonize their investment portfolios.

The PDC was co-founded in 2014 by UN Environment and its Finance Initiative (UNEP FI), the fourth national pension fund of Sweden (AP4), Europe's largest asset manager Amundi and CDP, the most important mechanism for climate disclosure worldwide.

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FOREWORD

The great challenge of the next few decades will be to make economic growth and social development compatible with the stability and health of the world we live in. Achieving that will require nothing short of a greening and decarbonizing of capitalism: putting to work the energy and innovation of the market - which over the last two centuries has forged modern economies and raised hundreds of millions out of poverty - into protecting the global commons, including the world's atmosphere.

In the latest annual report of the Portfolio Decarbonization Coalition, we examine the progress made by its members in assessing and taking investment action on climate-related risks and opportunities, and by extension, in decarbonizing capital allocation and portfolio design worldwide.

One of the key developments over the past year has undoubtedly been the work of the Financial Stability Board's (FSB) Task Force on Climate-Related Financial Disclosures (TCFD) and the recent publication of its Final Recommendations Report. These recommendations build on 16 years of CDP's work driving environmental disclosure, and will be incorporated into CDP sector-focused disclosure and scoring going forward, ensuring the provision of the most relevant and meaningful data for companies and investors.

The framework that the TCFD puts forward, and the political impetus driving its adoption, have the potential to enable the world's corporations to consider, assess and disclose the impacts of climate change on their business, as well as their contribution to achieving the Paris Agreement, in a more sophisticated manner.

There are a number of core features in the TCFD Framework that make it stand out, and mark a new stage in the journey to full disclosure of climate as well as broader environmental, social and governance issues.

Meaningful assessments of the financial risks and opportunities of climate change can only be achieved in a forward-looking way, and given that its impacts are not static, it is crucial to be prepared for a range of different situations. That is why the strong emphasis on forward-looking, scenario-based assessments is so critical, and so promising in advancing the robustness, 'scrutinisability' and credibility of climate-related disclosures.

The TCFD's work has been undertaken under the auspices of the financial regulatory community. This is the first time that international financial regulators are taking a stance, mandating and endorsing work on the financial repercussions of an environmental issue.

Perhaps the most profound innovation in the TCFD framework, however, is that it views not only companies - so the recipients of capital - as the sole providers of climate-related disclosures, but that it also asks investors and other financial intermediaries - as the providers of capital - to carry out and fully disclose their own climate-related risk and opportunity assessments.

It might seem that this is a mere technicality but in fact it is a 'game-changer'. Since investors will now be expected to provide transparency on their climate-related risks and opportunities, and be scrutinised accordingly, they will be more determined to obtain climate-related data from the companies in their portfolios, in the format and to the quality that they require for their own disclosure. The resulting effect will be to improve and refine the practice of corporate climate-related disclosure, and the availability of corporate data.

However, it is not the preparation of investor climate-related assessments that will make the biggest impact. This will come as a consequence of these assessments, when investors begin to systematically integrate climate factors into their decision making processes, influencing their asset allocation, their portfolio design and their shareholder engagement priorities. Thus, reallocating capital and decarbonizing their portfolios so that they are aligned with the low-carbon economy.

The result will be to reward environmental out-performance and penalize environmental under-performance. Thus providing companies with little choice but to align themselves with the low-carbon economy.

The inclusion of investors as climate disclosers in the TCFD framework, at last, promises to provide clarity around climate integration by investors. The Portfolio Decarbonization Coalition, in turn, promises to continue mobilizing and supporting investors to - on the basis of their TCFD assessments - take the action required and to widen, deepen, and accelerate, their efforts to align their portfolios with a low-carbon future.

We will do so by growing our commitments-based membership; by convening leading investors worldwide; and by guiding, monitoring and documenting investor innovation and progress through our annual reports.

If a critical mass of the world's investors follows the example of the Portfolio Decarbonization Coalition and becomes increasingly systematic in its appraisal and consideration of climate-related risks and opportunities, we will have nudged investors a little bit closer to becoming a leading force in greening capitalism



Eric Usher
Head, UNEP Finance Initiative



Paul Simpson
CEO, CDP

EXECUTIVE SUMMARY

The landscape of climate change-related policy, politics and finance has changed dramatically since the Portfolio Decarbonization Coalition (PDC) was founded in 2014. The ratification of the Paris Agreement in 2016, the release of the final recommendations of the Financial Stability Board's (FSB's) Task Force on Climate-related Financial Disclosures (TCFD) in 2017 and the growing understanding of the financial and portfolio risk posed by climate change have all reinforced the importance of climate change to institutional investors, and the importance of institutional investors to climate change and to climate-focused policy makers.

THE FINANCIAL OUTCOMES OF PORTFOLIO DECARBONIZATION

PDC signatories have made high-level commitments to decarbonization, and have started to implement decarbonization strategies across their portfolios. These actions are enabling PDC signatories to improve the carbon characteristics of their investment portfolios and funds, and to improve their investment performance, as displayed by the following list of portfolio decarbonization outcomes:

Examples of Portfolio Decarbonization Outcomes

- ABP: At the end of 2016, the CO₂ footprint, measured in emissions per Euro invested, of ABP's listed equity portfolio was approximately 16% lower than in ABP's reference year of 2014.
- Australian Ethical: The carbon footprint of Australian Ethical's listed equities investments were assessed as having a third (34%) of the carbon footprint of its reference benchmark (a blend of S&P ASX 200 and MSCI World).
- CDC: The carbon footprint of CDC's listed equity portfolio declined from 0.452 te CO₂e per thousand Euros invested at 31/12/2014, to 0.332 te CO₂e per thousand Euros invested at 31/12/2016.
- ERAFP: At the end of 2016, ERAFP's portfolio had a carbon intensity that was 17% lower than its benchmark, the MSCI World.
- FRR: At the end of 2016, the carbon intensity – expressed in terms of the emissions per million Euros of turnover of the companies in the portfolio – of FRR's equity portfolio was 28.9% less than that of its benchmark index. Furthermore, the emissions per Euro invested in the FRR's portfolio were 28.4% lower than the benchmark index.
- FRR: Between 2013 and 2016, the FRR's portfolio reduced its carbon footprint by 37.5%, whereas the benchmark fell by just 17.6%.
- Hermes: On a like-for-like portfolio basis, Hermes reduced the emissions from its real estate portfolio by 8% per annum in the period from 2006 to 2016.
- Local Government Super (LGS): At 31 December 2016, LGS's Australian equities portfolio had 0.2% lower carbon emissions (in terms of greenhouse emissions per dollar invested) and its international equities portfolio had 16% lower carbon emissions than their respective benchmarks.
- Mandatum: In 2016, the carbon intensity of Mandatum's equity investments was 26% less than the relevant benchmark with the carbon intensity of its fixed income and balanced assets investments being 58% and 78% less than the carbon intensity of their relevant benchmarks.
- Öhman: The average carbon footprint of Öhman's listed equity funds reduced by 17.4% from 2015 to 2016.
- University of Sydney: At 30 September 2016, the University's listed shares portfolio had a 28.4% lower carbon footprint than the weighted average of its benchmarks.

THE ENVIRONMENTAL IMPACTS OF PORTFOLIO DECARBONIZATION

Despite these positive outcomes, there is limited information on how the portfolio decarbonization efforts of PDC signatories are affecting the real economy, as measured by, for example, changes in greenhouse gas (GHG) emissions, changes in the GHG-intensity of economic activity, the diversion of financial flows in the real economy, or changes in the share price of high emitting or high impact companies.

This reflects a variety of factors: the relatively few investors that have made portfolio decarbonization commitments, the weaknesses in the objectives being set for investor engagement, the lack of investor reporting on the outcomes of shareholder engagement efforts, the lack of clarity about the relevance of climate change to investment decision-making, and the lack of emphasis on additionality in the decarbonization targets that are being set by investors.

Ensuring that the actions taken by investors to decarbonize their portfolios have a material impact on capital expenditure in the real economy and, ultimately, on GHG emissions trajectories in the real world will require a much more forceful and assertive approach to decarbonization from individual investors and from the investment community as a whole.

The parameters of this challenge are yet to be fully defined but this report points to five headline conclusions:

1. Engagement must be much more outcome oriented. Individual and collective engagement initiatives should:
 - a. Be explicit about the outcomes they wish to achieve.
 - b. Align with science-based targets or with the goals of keeping global temperature rise below 2 degrees Celsius.
 - c. Be clear about their additionality or what they are delivering above and beyond what would have happened anyway.
 - d. Commit to formally, regularly and publicly reviewing the outcomes that they have achieved, and be prepared to escalate if their goals are not being achieved.
2. Engagement must be conducted at scale, bringing the leverage of large numbers of investors to bear.
3. Investment decision-making must be explicit. Investors must explain how climate change is factored into their investment decision-making, and they must explain the role played by climate factors when making investment, divestment and over/underweighting decisions. This signalling is critical to enable companies and other stakeholders to see and understand the factors driving investment decisions.
4. Investors must work together. Unilateral commitments to divestment, for example, have limited impact on companies' share prices or cost of capital.
5. Decarbonization must be about additionality. Investors must explain how the actions they are taking are additional to those actions that they would have taken anyway.

PRIORITIES FOR PROGRESS AND MORE IMPACTFUL ACTION

Despite the progress that has been made and the leadership that has been shown by PDC signatories, investors looking to decarbonize their portfolios still face substantial challenges in relation to the availability of information, the availability of tools and methodologies, and their understanding of the most effective decarbonization strategies.

In the 2016 PDC annual report, we identified 14 priority areas for action. In the survey that has underpinned this report, we asked PDC signatories to indicate which of these was most important. The responses allowed us to divide these into three groups: those that more than two thirds of respondents saw as a high priority, those that more than 50% saw as a priority, and those that less than 50% saw as a priority. The high priority areas for action, as identified by PDC signatories, are as follows:

Identified as a high priority by more than two-thirds of survey respondents	
Broad objectives yet to be accomplished	Specific investor needs
Providing investors with information that they need	Improving company disclosures on Scope 1 and 2 emissions
Providing investors with information that they need	Improving company disclosures on forward-looking, scenario-based risk and opportunity assessments
Helping investors to assess and quantify climate risk	Developing or improving transition risk measurement and assessment methods for investors
Helping investors to act on climate change	Share expertise and solutions
Identified as a high priority by more than half but less than two-thirds of survey respondents	
Broad objectives yet to be accomplished	Specific investor needs
Providing investors with information that they need	Advocating for mandatory, standardized corporate disclosure schemes on climate-related risks and opportunities
Helping investors to assess and quantify climate risk	Developing climate-related (science-based) target-setting frameworks for investors
Helping investors to assess and quantify climate risk	Developing investor guidance to assess and quantify transition risk exposure

THE TCFD FRAMEWORK AS A CATALYST OF PORTFOLIO DECARBONIZATION

Almost all PDC signatories agree that the TCFD framework will be of great usefulness in improving the availability of data needed to inform investors' decarbonization strategies and decisions. There is particular interest in the potential for companies to provide more forward-looking data, and analysis that goes beyond assuming that current regulatory and technological circumstances will continue to persist into the future.

Most PDC signatories agree that institutional investors should prepare TCFD-compliant disclosures themselves. However, respondents noted that standardized approaches and best practices are not available, and that there is a lack of data on how the financial risks of climate change should be assessed or reported against.

INTRODUCTION: SETTING THE SCENE

THE CHANGING DRIVERS FOR ACTION

The climate change landscape has changed dramatically since the Portfolio Decarbonization Coalition (PDC) was founded in 2014. The Paris Agreement, adopted in 2015 and ratified in 2016, commits participating countries to an aim of holding the increase in the global average temperature to well below 2°C above pre-industrial levels. These countries also commit to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels. To date, over 160 countries have made pledges – Nationally Determined Contributions (NDCs) – explaining how they intend to contribute to the Paris Agreement targets.

Delivering emissions reductions of the magnitude envisaged by the Paris Agreement will require radical changes in corporate practice, strategy and behaviour, particularly in those sectors of the economy that are GHG and energy intensive. It will also require huge capital investment by the public and private sectors.

The pressure for more ‘integrated’ and serious action by investors has been increased by the release of the recommendations from the Financial Stability Board’s (FSB’s) Task Force on Climate-related Financial Disclosures (TCFD)¹. The TCFD’s objective is to develop climate-related disclosures that “could promote more informed investment, credit [or lending], and insurance underwriting decisions” and, in turn, “would enable stakeholders to understand better the concentrations of carbon-related assets in the financial sector and the financial system’s exposures to climate-related risks.” The TCFD recommends that all corporate and financial entities report in four areas: governance, strategy, risk management, and metrics and targets.

DEFINITION: PORTFOLIO DECARBONIZATION

Portfolio decarbonization refers to systematic efforts by investors to align their investment portfolios with the goals of a low-carbon economy. It includes, but is not limited to, efforts to reduce the carbon footprint of investment portfolios, to increase investment in areas such as renewable energy, to withdraw capital from high energy consumption activities and to encourage companies and other entities to reduce their emissions and support the transition to a low carbon economy.

While there have been other disclosure initiatives focused on companies, TCFD is different in two ways: First, it explicitly identifies financial-sector organisations, including banks, insurance companies, asset managers, and asset owners, as entities that not only are meant to receive disclosures from investees and debtors, but also as entities that need to disclose themselves on how they manage climate-related risks and opportunities. Secondly, it asks these organisations to provide forward-looking assessments, by reporting on the resilience of their business strategy under different climate-related scenarios, including a ‘2° Celsius or lower’ scenario. As such, it requires organisations to look beyond current and near-term regulatory, technological and meteorological circumstances which too often fail to reveal the impacts that climate change is likely to have on their business models and financial performance in the future.

1. www.fsb-tcfd.org/

THE INVESTOR RESPONSE

Many institutional investors have long track records of action on climate change: they have invested in low carbon strategies (e.g. through green bonds), encouraged companies to reduce their greenhouse gas emissions, withdrawn capital from high emitting sectors, and encouraged governments to adopt policy measures that accelerate the transition to a low-carbon economy.

Yet, it is clear that much more needs to be done if the investor community is to effectively support and catalyse the low-carbon economic transition. Despite having high-level policy commitments to action, most investors have not substantially altered their core activities (e.g. asset allocation, portfolio and risk management) to respond to the challenges, risks and opportunities presented by climate change.

THE PORTFOLIO DECARBONIZATION COALITION

The Portfolio Decarbonization Coalition (PDC) was co-founded in 2014 by the United Nations Environment Programme Finance Initiative (UNEP FI), AP4, Amundi and CDP. PDC supports the low-carbon economic transition by mobilising institutional investors to systematically and methodically align their investment portfolios with the low-carbon economy. By showcasing the work of its signatories, PDC

aims to stimulate and catalyse further action by investors, at the same time as signalling to policymakers and companies that investors are committed to fully integrating climate and GHG related factors into their routine financial decision-making.

As at 1 November 2017, PDC had twenty-eight (28) asset owner and asset manager signatories, representing over US\$3 trillion in assets under management (see table 1).

Table 1: PDC Signatories

Organisation Name	Country of Origin	Organisation Type	Assets Under Management
ABP	Netherlands	Asset owner	US\$408 billion
Allianz	Germany	Asset owner	EUR651 billion
Amundi	France	Asset manager	EUR1,121 billion
AP4	Sweden	Asset owner	US\$39.3 billion
Australian Ethical	Australia	Asset manager	US\$1.75 billion
BNP Paribas Asset Management	France	Asset manager	US\$647 billion
Caisse des Dépôts	France	Asset owner	US\$164 billion
Church of Sweden	Sweden	Asset owner	US\$970 million
Environment Agency Pension Fund	United Kingdom	Asset owner	US\$4.1 billion
ERAFP	France	Asset owner	US\$30.7 billion
FRR (Fonds de Réserve pour les Retraites)	France	Asset owner	US\$37.8 billion
Hermes Investment Management	United Kingdom	Asset manager	US\$39.1 billion
Humanis	France	Asset owner	US\$13 billion
Inflection Point Capital Management	United Kingdom	Asset manager	US\$1 billion
KLP	Norway	Asset owner	NOK 476.2 billion
Local Government Super (LGS)	Australia	Asset owner	US\$8.5 billion
Mandatum Life Investment Services	Finland	Asset manager	US\$3.8 billion

Organisation Name	Country of Origin	Organisation Type	Assets Under Management
Mirova	France	Asset manager	US\$9.3 billion
MN	Netherlands	Asset manager	US\$144 billion
New York State Common Retirement Fund	United States	Asset owner	US\$192.4 billion
Öhman	Sweden	Asset manager	US\$9 billion
RobecoSAM	Switzerland	Asset manager	US\$6.0 billion
Sonen Capital	United States	Asset manager	c. US\$380 million
Storebrand	Norway	Asset manager	US\$69 billion
Toronto Atmospheric Fund	Canada	Asset owner	c. US\$23 million
University of Sydney	Australia	Asset owner	US\$1.2 billion
Univest	The Netherlands	Asset owner	US\$23 billion
WHEB Asset Management	United Kingdom	Asset manager	US\$200 million

WHAT ARE THE MOTIVATIONS FOR PORTFOLIO DECARBONIZATION?

For all of the 26 survey respondents the key motivations for decarbonization are financial. Reducing their portfolio exposure to greenhouse gas emissions and carbon intensive industries is seen by them as a means of strategic risk mitigation. While investing both in companies that are the most carbon- and energy-efficient in their sectors, as well as in companies that are developing the solutions and technologies required for decarbonization, is seen as an opportunity for performance.

Additionally, many of the respondents see responding to climate change as an integral part of their responsibilities as

fiduciaries or as stewards of other peoples' money, as illustrated by the quotes.

The most striking finding was how many of the respondents (20 out of 26) stated that a key motivation for them to decarbonize their portfolios was to signal to policymakers that investors are supportive of policy action that supports or enables the transition to a low carbon economy.

These motivations are often captured and codified in formal statements of investment beliefs as illustrated in the cases of the Environment Agency Pension Fund and Local Government Super in Box 1.

Box 1: Investment Beliefs

Environment Agency Pension Fund

We believe that:

- Climate change presents a systemic risk to the ecological, societal and financial stability of every economy and country on the planet, with the potential to impact our members, employers and all our holdings in the portfolio.
- Climate change is a long term material financial risk for the Fund, and therefore will impact our members, employers and all our holdings in the portfolio.

Local Government Super

At LGS we recognise that the long term prosperity of the economy and the wellbeing of our members depends on a healthy environment, social cohesion and good governance of LGS and the companies in which we invest. As a universal investor with index holdings, we have an interest in all major companies in Australia and overseas and need to ensure they are managing their risks appropriately. LGS considers climate change to be the greatest risk that our investment portfolio faces. We are committed to:

- Manage the risks and take advantage of the opportunities associated with climate change;

- Considering the impacts of climate change is both our legal duty and is entirely consistent with securing the long term returns of the Fund and is therefore acting in the best long term interests of our members.
- Selective risk-based disinvestment is appropriate but engagement for change is an essential component in order to move to a low carbon economy.

- Monitor the carbon performance of the portfolio and strive for improvements;
- Ensure that climate change risks are considered by our advisors and investment managers;
- Ensure that climate change risks are analysed as part of the due diligence procedures for new investments;
- Participate in climate change related collaborative initiatives; and
- Communicate our carbon performance and activities to members.

Climate change poses a material risk to our investments and poses a systemic financial risk that affects the market as a whole.

Thomas DiNapoli, Comptroller of the State of New York

Climate change and global warming have major financial impact on all of AP4's investments and have incalculable consequences for the earth, its nature and inhabitants. Our efforts to reduce our carbon emissions will help us protect the fund's assets and returns as carbon dioxide emissions and fossil reserves are revalued.

Niklas Ekvall, CEO, AP4

Climate change is a key issue for long-term investors such as pension funds.

Corien Wortmann-Kool, Chair of the Board of Trustees, ABP

Recent years have seen many green financial innovations including low-carbon indexes and green bonds. There is still a need to push the envelope and develop ways through which institutional portfolios unlock new money for the low-carbon transition. At Amundi that is one of our key ambitions and motivations.

Fred Samama, Deputy Global Head,
Institutional Clients, Amundi

It will be easier to attract mainstream investors by showing them the value of tapping into the growth potential of the transition to a low-carbon economy, whether through new companies, innovative technologies or by adapting new business models. This transition represents a game-changing opportunity.

Saker Nusseibeh, CEO, Hermes Investment Management

Given that climate change will impact both our insurance and investment businesses, mitigating risk and accessing opportunities from climate change is a strategic priority.

Günther Thallinger, Member of the
Board of Management, Allianz SE

MN considers a proper response to the opportunities and risks of climate change to be part of its fiduciary responsibility. The transition to a climate-resilient economy is not 'merely' an environmental issue but a fundamental economic transition affecting almost every sector in which MN invests.

Gerald Cartigny, CIO, MN

Our motivations are twofold: to contribute to global GHG reduction efforts and to mitigate carbon-related financial risks.

Dr Grégory Schneider-Maunoury, Head
of SRI, Humanis Gestion d'Actifs

Our objectives are to reduce carbon risk, enhance financial returns and be part of the transition to a low carbon economy.

Gunnela Hahn, Head of Sustainable Investment, Church of Sweden

WHAT TARGETS ARE INVESTORS SETTING FOR PORTFOLIO DECARBONIZATION?

The formal targets that PDC's signatories have set for themselves reflect their motivations for decarbonizing their investment portfolios. For example, to manage the financial risks and investment opportunities, and to support the low carbon transition. The targets also reflect the practical realities of the data and tools that are available to enable them to assess and report on the effectiveness of their decarbonization activities, as will be discussed later in the report.

In table 2 we present examples of the targets that PDC signatories have set for themselves. The targets differ in their areas of focus; some relate to portfolio carbon emissions, others to the amount of capital invested in areas such as energy efficiency and others to the reduction in the amount of capital invested in areas such as fossil fuel extraction. The targets also differ in terms of the timeframes over which they are set, varying from the near term (next year, to 2020), to the medium and long-term (with some set out to 2050).

Table 2: Examples of the Targets set by PDC Signatories

Organisation	Targets
ABP	<ul style="list-style-type: none"> To reduce the carbon footprint per Euro invested in ABP's listed equity portfolio by at least 25% by 2020 compared to a 2015 baseline To have EUR 5 billion of assets invested in renewable energy
Allianz	<ul style="list-style-type: none"> To double infrastructure equity investments in photovoltaic and wind parks in the medium term To not make any further investments in mining companies deriving 30% or more of their revenues from mining thermal coal or in electric utilities deriving 30% or more of their generated electricity from thermal coal
Australian Ethical	<ul style="list-style-type: none"> To fully decarbonize Australian Ethical's investment portfolio by 2050
Caisse des Dépôts	<ul style="list-style-type: none"> To reduce CDC's fully owned real-estate portfolio's energy consumption by 38% between 2010 and 2030 To reduce the carbon footprint of CDC's directly held listed equity portfolio by 20% per thousand Euros invested between 2014 and 2020 To allocate a total of 15 billion Euros between 2014 and 2017 to, amongst others, sustainable city and mobility projects, renewable energy production, storage and smart networks, energy efficiency solutions, and companies operating in the green energy and environmental sectors To avoid investing in the equity and bonds of companies in the mining and utility sectors whose exposure to thermal coal exceeds 20% of the company's turnover
Church of Sweden	<ul style="list-style-type: none"> To have zero investments in coal, oil and gas
Environment Agency Pension Fund	<ul style="list-style-type: none"> To invest 15% of the fund in low carbon, energy efficient and other climate mitigation opportunities by 2020, as part of the fund's wider target to invest at least 25% of the fund in clean and sustainable companies and funds, across all asset classes To reduce the equity portfolio's exposure to "future emissions" (i.e. the amount of greenhouse gases that would be emitted should the fossil fuel reserves owned by the corresponding companies be extracted and ultimately burnt) by 90% for coal and 50% for oil and gas by 2020, compared to the exposure in the reference benchmark as at 31 March 2015
FRR	<ul style="list-style-type: none"> To reduce the carbon intensity and the fossil fuel reserve exposures of passive equity investments by at least 50%
Hermes	<ul style="list-style-type: none"> To reduce the absolute and relative-to-area carbon emissions from Hermes' real estate portfolio by 40% by 2020, from a 2006 baseline
University of Sydney	<ul style="list-style-type: none"> To reduce the carbon footprint of the University's listed share portfolio by 20% relative to its listed equity composite benchmark by 2018

We believe that we will soon be in compliance with a 2°C scenario for our listed equity portfolios but we do not want to communicate this message until we have completed our analysis of the full impacts on portfolio construction.

Mirova

We have not set quantitative carbon reduction targets for our equities and bonds portfolios. One of the key challenges we face is to set targets that do not result in us missing investment opportunities. Taking advantage of the opportunities created by the low carbon transition and regulatory drivers is not always about buying best-in-class performers, as sometimes it can be better to find a laggard that has committed to change, or companies with the best carbon performance, as this may exclude companies - e.g. those producing low weight material for transport or service companies - with positive climate impacts.

Tatiana Bosteels, Director for Responsibility,
Hermes Investment Management

We have not set decarbonization targets because the carbon emitted by the companies in our portfolio is a small part of the overall contribution that they make to tackling climate change. The scope 1 and 2 carbon emissions of the fund equate to approximately 74 tCO₂e per £1m invested. This compares with approximately 1,600 tonnes of CO₂e emissions avoided per £1m invested when you include the contribution made by products and services sold by companies in the portfolio.

Seb Beloe, Partner, Head of Sustainability
Research, WHEB Asset Management

Many of the targets are based on so called company-level Scope 1 and 2 emissions. Scope 1 emissions are greenhouse gas emissions from sources that are owned or controlled by the portfolio company or project at hand; these include emissions from fossil fuels burned on-site, and emissions from company-owned or leased vehicles. Scope 2 emissions result from electricity generation, heating and cooling, or steam generated off site but purchased by the company or project at hand.

There is reasonable data on Scope 1 and 2 emissions, at least for listed companies, and they align with the areas where companies have the most control. However, Scope 1 and 2 emission inventories have limitations: they may not account for a company's full climate change impact (e.g. emissions from the extraction and production of purchased materials and fuels, emissions associated with the use of the company's products), they may not provide a full account of company exposures to so-called transition risks, they may not capture the wider contribution that companies, their products and their services make to the low carbon economy.

Despite these limitations, investors have been reluctant to move away from their focus on Scope 1 and 2 emissions. These reasons include the many gaps in the available data, the fact that companies may have relatively limited influence over the emissions associated with raw materials production, the potentially significant costs of conducting life-cycle assessments and the lack of consensus on who is responsible for emissions and who can claim the credit for emissions savings.

Of the 26 investors that completed the signatory survey, ten have not yet set quantified decarbonization targets for their portfolios. There are three main reasons: The first relates to the technical issues identified in the previous paragraph, such as data gaps and the general absence of robust tools to set decarbonization targets or to measure performance against these targets. The second is that some investors consider that their investment strategy is already, by definition, lower carbon and, as a consequence, they are of the view that they do not need to set formal decarbonization targets. The third, is that companies provide limited forward-looking information (e.g. on their emissions, on future product developments, on potential technological changes). Further, the forward-looking information that is provided tends to assume that current regulatory, policy, technological and market conditions will remain broadly unchanged. A number of respondents commented that the TCFD's recommendations may stimulate change, as companies and investors will be encouraged to conduct and report on the results of scenario analysis.

In the survey, we asked PDC signatories to comment on the extent to which the targets they had set were ‘science-based’, that is the extent to which they explicitly relate to broader, economy-wide decarbonization pathways as stipulated by the scientific community. A number of PDC signatories have already set targets that reflect the current science. For example, the Church of Sweden states that its portfolio has been constructed to align with a 2 degrees scenario, Australian Ethical aims to align its investment portfolios with the economic transition needed to limit global warming to well below 2 degrees and BNP Paribas Asset Management states “we aim to progressively align our portfolios to a 2 degree scenario and the European 2 degree policy scenario in line with the TCFD recommendations and the French Energy Transition Article 173”. While other PDC signatories signalled their interest in setting science-based targets, they expressed concern about the quality of the data and tools that are available to set science-based targets and to monitor performance against these targets. One interesting development in this regard is the Transition Pathway Initiative (TPI), which is supported by AP4, BNP Paribas Asset Management, the Environment Agency Pension Fund, Hermes and Robeco, amongst others. TPI assesses whether a company’s future (projected) emissions align with the science-based targets for their sector or subsector. This opens up the possibility that investors could assess the proportion of the companies in their portfolio that have set science based targets, to the extent that they could assess the degree of portfolio alignment with science-based targets, and they could assess this against the market as a whole.

While we have sought to align our targets with current knowledge on decarbonization, our quantitative target for thematic allocation does not formally reference a particular scientific target, as there is no available methodology yet.

Caisse des Dépôts Group

We have set a target to fully decarbonize our investment portfolio (i.e. net zero portfolio emissions) in the timeframe needed to limit warming to well below 2 degrees. Following the Australian Climate Change Authority, we have assessed that a net zero emissions target date of 2050 is appropriate for our portfolios. The target applies to all our investments. We will keep this target date and our path to zero under review in light of growing scientific knowledge.

Phil Vernon, Managing Director, Australian Ethical Investment

Our objective is to ensure that our investment portfolio and processes are compatible with keeping the global average temperature increase to remain below 2°C relative to pre-industrial levels, in-line with international government agreements. We support the Transition Pathway Initiative, a science-based initiative where companies’ carbon performance is assessed using the modelling conducted by the International Energy Agency (IEA) for its biennial Energy Technology Perspectives report. This modelling is used to translate emissions targets made at the international level into sectoral benchmarks, against which the performance of individual companies can be compared. This then informs our decarbonization engagement targets.

Faith Ward, Chief Responsible Investment and Risk Officer, EAPF (now Chief Responsible Investment Officer, Brunel Pension Partnership)

Given the level of uncertainty and the inaccuracies in the data that are provided by businesses, it is difficult for anyone to claim being able to set ‘science-based’ targets. Even if such a target could be set, it would be difficult to check whether this target is reached or not. We have an ongoing project to compare our equity portfolio’s energy mix with the IEA’s 2°C scenarios in 2030 and 2050, and we have an ongoing project to develop a similar analysis for other sectors.

Pauline Lejay, Head of SRI, ERAFP

IMPLEMENTING PORTFOLIO DECARBONIZATION: WHAT STRATEGIES DO INVESTORS USE?

PDC signatories have adopted a range of strategies to decarbonize their investment portfolios. The most common are engagement, with 22 out of 26 survey respondents using this approach, negative screening or exclusions (20 out of 26) preferentially investing in particular sectors or activities (19 out of 26), voting (18 out of 26), and using portfolio tilts (14 out of 27).

When we analyse these strategies in further detail, there are six distinct trends to be seen:

- 1. More holistic and complete analysis:** Investors are focusing more attention on issues such as the viability of business models in a carbon-constrained world, and corporate strategy and capital expenditures in the context of the need to transition to a low carbon economy. The new generation of climate-related corporate disclosure, in response to the recommendations of the TCFD, is likely to further enable investors to carry out such comprehensive, forward-looking analyses.
- 2. More asset classes:** There is increasing work being carried out in asset classes other than listed equity and property, with particular attention being paid to corporate fixed income.
- 3. More green exposures:** As they reduce their portfolio exposures to carbon-inefficient technologies and companies, PDC signatories are increasingly seeking to gain exposure to the technological enablers of decarbonization, including renewable energy development and deployment, energy efficiency, for example, LED lighting, efficient motors, smart energy management technologies, products and activities that reduce energy usage such as recycling,

insulation, battery storage and enabling technologies, such as electric vehicles, smart grids.

- 4. Wider use of multi-pronged strategies and approaches:** For most PDC participants, portfolio decarbonization is not a single-track strategy. PDC signatories use a variety of strategies, with the strategies tailored to the specific characteristics of the asset class or even the company or entity in question. As some of the case-studies in this report illustrate, the use of multi-pronged strategies often provides benefits additional to those that would be obtained if the strategies were deployed in isolation.
- 5. Greater attention to the investment ecosystem:** An integrated approach to decarbonization often involves investors looking beyond their own portfolios. PDC signatories have, among other activities, supported the development of the green bond market, supported the development of low carbon indices and other products, and played an active role in policy debates on climate change. Much of this has been delivered in collaboration with other investors, civil society organisations and companies, through larger platforms and initiatives such as CDP, the Principles for Responsible Investment (PRI), the Institutional Investors Group on Climate Change (IIGCC), and the UNEP Finance Initiative (UNEP FI).
- 6. Ongoing gaps in products and services:** Bringing decarbonization to scale requires action from service providers and from asset managers. This issue was highlighted by a number of the survey respondents who noted that their ability to implement strong decarbonization commitments was constrained by the supply of appropriate investment products and opportunities.

THE NEED TO BUILD THE SUPPLY OF LOW CARBON SOLUTIONS

For large institutional investors like the CRF, more investment opportunities in the sustainable investment/climate solutions space that meet institutional investment criteria are needed. For efficiency, these investment opportunities need to be high quality investments at scale.

Liz Gordon, Executive Director, Corporate Governance, New York State Common Retirement Fund

Key challenges with our industry include the lack of investment managers with a strong track record, the insufficient choice of low carbon opportunities across asset classes and the lack of low carbon investment expertise among investment consultants.

Bill Hartnett, Head of Sustainability, Local Government Super

There is a lack of high quality investment products and opportunities across the full range of asset classes that we invest in.

Faith Ward, Chief Responsible Investment and Risk Officer, EAPF (now Chief Responsible Investment Officer, Brunel Pension Partnership)

Large-scale low-carbon investment vehicles (within, for example, infrastructure, sustainable cities, smart beta, and fossil free indices) are still quite rare, and are not marketed or structured in a way that large mainstream asset owners would want to invest in them. This has to change, fast.

Gunnela Hahn, Head of Sustainable Investment, Church of Sweden

CASE STUDIES: DECARBONIZATION STRATEGIES

CASE STUDY 1: FRR

The FRR has reduced its portfolio's CO₂ emissions by asking its passive managers to reduce the carbon footprint of the portfolios that they manage for FRR, and by excluding companies where thermal coal mining or thermal coal electricity generation business exceeds 20% of the company's revenue. In addition, the FRR is:

- Measuring its carbon footprint and the exposure of its portfolios to fossil fuel reserves.
- Reducing the carbon footprint (emissions and fossil fuel reserves) of its portfolios and therefore the associated carbon risk.
- Investing in renewable energy and innovative technologies.
- Pursuing dialogue with institutional investors and issuers as part of a policy of engagement centred around existing collaborative initiatives.
- Encouraging issuers to adopt virtuous behaviour by promoting greater transparency.

CASE STUDY 2: AP4

AP4's low carbon strategies include:

- Listed equities: At the end of 2016, 24% of AP4's global equity investments (\$16.2 billion) were invested in low-carbon strategies.
- Fixed income: AP4 provides funding for green projects by being active in the primary market for new green bond issuance, by trading on the green bonds secondary market to help the asset class become more liquid, and by sharing its knowledge concerning low-carbon strategies and green bonds.
- Wider market activities: AP4 is a supporting member of the Transition Pathway Initiative (TPI) which assesses how companies are preparing for the transition to a low-carbon economy by (a) evaluating and tracking the quality of companies' management of their greenhouse gas emissions and of risks and opportunities related to the low-carbon transition, and (b) evaluating how companies' future carbon performance compares to the international targets and national pledges made as part of the Paris Agreement.
- Wider market activities: AP4 supported the 2017 letter from global investors to G20 leaders, encouraging these leaders to deliver the commitments made in the Paris Agreement.

CASE STUDY 3: CDC

In listed equities, CDC's target is to reduce the carbon footprint of its directly held listed equity portfolio by 20% per thousand Euros invested between 2014 and 2020. Its primary strategies for meeting this target are corporate engagement and the group-wide exclusion of thermal coal (screening). CDC has also committed, if voluntary emissions reduction efforts by portfolio companies prove insufficient, to reallocate its portfolios in order to reach its reduction target by 2020.

In corporate bonds, CDC is conducting a carbon footprinting exercise as an initial step towards raising awareness. It has also started work on assessing potential climate credit risk impacts.

In real estate, CDC's energy consumption target will be met by a mix of retrofitting present portfolios and by acquiring energy efficient buildings.

CASE STUDY 4: MN

Following the example of the Paris Climate Agreement to reduce climate change to less than two degrees Celsius MN formulated a climate policy together with its principals and clients consisting of the following actions:

- Annually measuring and publishing the CO₂ footprint of its equity portfolios.
- Entering into discussion with the ten companies responsible for the greatest CO₂ emissions in the equity portfolio to encourage them to reduce these emissions.

If companies make insufficient progress, MN may choose to reduce its holdings.

- Pooling the ideas and advising governments and other legislators and regulators about implementation and compliance with effective climate regulation.
- Increasing the climate awareness of external managers and holding them responsible for making the CO₂ emission understandable and measurable in their portfolios.

CASE STUDY 5: HERMES

Hermes' approach to managing its exposure to carbon risk and to accessing opportunities from the transition to a low carbon economy has four elements:

- Ensuring that portfolio managers are aware of the carbon risks in their portfolios, which investments are the largest contributors, what are the associated risks and mitigation strategies.
- Ensuring that portfolio managers integrate carbon risk considerations alongside other value and risk considerations, exploiting green investment opportunities or divesting where carbon risk alongside other factors impacts value.

- Acting as engaged stewards of the investments it manages, managing directly-owned assets and engaging with public and private companies to mitigate carbon risk.
- Engaging with public policymakers and sector organisations, nationally and internationally, to encourage policy or best practice which facilitates the transition to a low carbon economy.

These activities cover Hermes, public equities and credit, private real estate and infrastructure assets, representing US\$35 billion assets under management (AUM) as of 30 June 2017, or 90% of its AUM.

CASE STUDY 6: KLP

Through its capital allocation, its engagement and its carbon reduction activities, KLP wants to send a strong signal to companies and markets that it would like to see a transition to a low carbon economy. Heidi Finskas, Vice President Corporate Responsibility, KLP

Examples of KLP's decarbonization activities include:

- Becoming one of the investors in Climate Investor One, an innovative approach to infrastructure financing designed to accelerate the delivery of renewable energy projects in emerging markets.

- Divesting from coal companies.
- Engaging with companies to encourage greenhouse gas emissions reductions.
- Supporting the RE100 and EP100 investor initiatives.
- Supporting several climate related proposals at annual general meetings.
- Adding green buildings to its portfolio. In 2017, one new green building was completed, giving KLP a total of 9 buildings certified according to the BREEAM standard.

CASE STUDY 7: UNIVERSITY OF SYDNEY

All of the University's investment managers have been surveyed to evaluate their approach to ESG and their approach to carbon mitigation. The University encourages its investment managers to integrate climate change risk and emissions intensity into their portfolio construction processes, and to engage with

portfolio companies around emissions disclosure and reduction targets. In FY2016, the University required any new potential managers complete an ESG and climate change survey and to conduct a carbon footprint before they could be appointed.

HOW DO INVESTORS MEASURE PROGRESS?

The manner in which PDC participants measure and report on progress, unsurprisingly, reflects the motivations that drive them, namely (i) managing investment risks, (ii) maximising investment opportunities, and (iii) contributing to the low-carbon economy. PDC signatories currently measure progress against their targets in financial terms and/or in terms of the carbon characteristics of their portfolios and/or in terms of

their portfolio exposures to climate change. As yet, however, there has been limited analysis of how these activities have contributed to the wider goals of a low carbon economy; the notable exception are those few investors (see, for example, the ERAFP case study below) that have reported on the emissions avoided through their investment activities.

FINANCIAL MEASURES

Those PDC signatories that have set targets that relate to financial parameters have generally expressed these in terms of the amount of capital invested in and/or the percentage of the portfolio invested in low carbon strategies. These are defined in various ways, including relatively narrow definitions focused on renewable energy and energy efficiency, or wider definitions that include areas such as green bonds and/or green property, or low-carbon indexes.

To date, PDC signatories have not published bespoke or specific targets for the financial performance of their investment portfolios or low carbon funds. It is interesting, however, to note that approximately half of the survey respondents do report some information on the financial performance of at least some of their low carbon portfolios relative to their benchmarks. These data are discussed further in the next section.

CARBON AND CARBON EXPOSURE MEASURES

Reporting on the carbon characteristics of portfolios or on the progress against portfolio-level decarbonization targets is much more common. PDC signatories use a variety of metrics to track and report progress, the most common of which are presented in Table 3. Most of the metrics relate to GHG emissions in some form, although there is limited consistency on inclusions and exclusions, or on whether the reporting covers some or all funds or asset classes (most reporting remains focused on listed equities). This variation in metrics limits the assessments that can be made between different investment organisations. While it is possible to draw conclusions about how an organisation is performing against its targets, it is

difficult to compare the performance of two different investment organisations.

This problem of comparability is compounded by the fact that PDC signatories normalise data in different ways. Amongst others, PDC signatories normalise metrics by the value of the fund or by the assets under management (for example, reporting greenhouse gas emissions per dollar invested in the relevant fund or portfolio), by the turnover of the companies in the fund or by the number of companies held. We are also seeing the emergence of asset class specific metrics; for example, many real estate investors normalise emissions or energy usage by building floor area.

Table 3: Metrics Used by PDC Signatories to Assess Progress Against their Decarbonization Targets

- Changes in portfolio carbon-intensity (or in portfolio total carbon), based on portfolio companies' Scope 1 and 2 greenhouse gas emissions.
- Changes in portfolio carbon-intensity (or in portfolio total carbon), based on portfolio companies' Scope 1, Scope 2 and direct suppliers' greenhouse gas emissions.
- Changes in portfolio carbon-intensity (or in portfolio total carbon), based on portfolio companies' Scope 1, 2 and 3 greenhouse gas emissions.
- Changes in the total potential greenhouse gas emissions from fossil fuel reserves attributable to portfolio companies.
- The avoided greenhouse gas emissions (e.g. from renewable energy and other decarbonization 'solutions') facilitated by portfolio companies, and/or the share of those avoided emissions that can be attributed to the investor
- Changes in climate-related corporate practices and climate-related reporting, in reaction to a shareholder engagement effort.

It is likely that these challenges of comparability and inconsistency will become more acute as PDC signatories move beyond listed equities. PDC signatories have identified three issues:

1. Different metrics may be required for different asset classes. For example, similar metrics can be used for listed equity, corporate fixed income and private equity. However, for real estate, it may be more meaningful to report on the energy ratings of buildings in the investment portfolio.
2. It is unclear how to allocate or attribute emissions across an investment portfolio. For example, should the emissions associated with electricity generation be attributed to the electricity generator (as Scope 1 emissions), to the company using the electricity (as Scope 2 emissions) or to the products produced using this electricity (Scope 3 emissions). Another issue is how to allocate emissions across a company's capital structure; while there is growing consensus around the use of enterprise value (i.e. debt plus equity minus cash) as the denominator, the influence that equity and debt investors have over the corporate entity may be quite different. PDC signatories noted that these issues are particularly important to investors that need to report on their performance, and to stakeholders using this information to compare investors. However, these double-counting issues may be less important to investors who want to better understand their carbon exposures and use this information to inform their investment decision-making.

3. Data availability and data quality. The survey respondents noted that many companies still do not report on their greenhouse gas emissions, that companies often only report on a subset of their emissions, that companies use a variety of calculation methodologies and assumptions, that data are often not assured, and that the reporting tends to be backward rather than forward-looking. They acknowledged that there has been a significant improvement in the quality of the data provided by listed companies (in particular from medium and large caps in Europe and North America), but noted that there are ongoing major weaknesses in the data being provided by unlisted companies (e.g. fixed income issuers), by smaller companies, and by companies in markets other than Europe and North America. More generally, they noted that there are significant data gaps in fixed income, private equity and infrastructure.

There is a significant amount of work going on in many of these areas, in particular in relation to data quality. Investors are actively supporting disclosure initiatives such as CDP, the Carbon Disclosure Standards Board, and the Portfolio Carbon Initiative, and many are engaging directly with investee companies to encourage improvements in the quantity and quality of the data being reported.

CASE STUDY: ERAFP PERFORMANCE METRICS

ERAFP uses a variety of metrics to assess its contribution to the low carbon transition and to climate objectives. The measures it uses for reporting are:

- 1. Green share:** This represents the share of company revenue that corresponds to a green activity within the meaning of the Energy and Environmental Transition Law in France. This share is determined by a specific methodology for each of six sectors (electricity generation, automotive, passenger transport, and transport of goods, cement and steel). For example, in the automotive sector, the green share is defined as the proportion of revenue generated by the sale of electric and hybrid vehicles.
- 2. Energy transition contribution intensity:** This indicator evaluates the company's performance on a scale of 0% to 100%. A company is awarded 100% if the activity has a carbon performance equal to that of green activities, as defined by the French Energy and Ecological Transition

for Climate (TEEC) Label and 0% if the activity has a carbon performance corresponding to the average for its sector. If the activity falls between these two points, the company is awarded between 0 and 100% depending on its carbon performance. For example, in the automotive sector example: each car maker's carbon intensity (gCO₂e/km) is plotted on a scale ranging from the average European car's carbon performance to that of an environmentally friendly electric vehicle.

- 3. Avoided emissions:** ERAFP measures the emissions avoided by a higher than average carbon performance for each sector.

The results of the green share, intensity of contribution to the energy transition and emissions avoided of ERAFP's corporate bond and equity portfolios at 31 December 2016 are shown in the table below.

Green share, intensity of contribution to the climate transition and emissions avoided of the corporate bond and equity portfolios at 31 December 2016

	Green share	Intensity of contribution to the climate transition	Emissions avoided
	%	%	TCO ₂ e/year/€m
Aggregate equities	14	13	242
European equities	13	14	254
US equities	42	1	10
Pacific equities	8	10	141
EUR credit	8	15	761
USD credit	24	26	372
Aggregate convertibles	27	16	430

Source: iCare and Consult

CASE STUDY: ROBECOSAM ASSESSING PERFORMANCE IN FIXED INCOME

RobecoSAM uses enterprise value as a metric to standardize emission data at the company level for a number of reasons:

- It clearly signals that the creditors of a company, as well as its shareholders, have some responsibility for its environmental footprint of the company.
- It allows the carbon intensity of fixed income (corporate credits) investments and portfolios (including those with non-listed holdings) to be measured using the same method as for equity portfolios.
- It means that there is a carbon tag for every dollar invested, allowing a portfolio's carbon intensity to be easily compared to the benchmark or any other portfolio.
- Enterprise value is less sensitive to market movements than market cap data.
- Enterprise value is not sensitive to leverage ratio, as it is calculated on the full value of the business.

The use of market cap data to measure an investor's responsibility for a company implies that it is only equity investors that have responsibility, and that bond holders are exempt from any responsibility.

Daniel Wild, PhD, Head of Sustainability Investing R&D and Member of the Executive Committee, RobecoSAM

Data availability through third party vendors is good but data quality is an issue. The ratio of estimated data in relation to reported data is still high and the problems related to measuring carbon emissions/intensity for fixed income securities has not been resolved entirely. Also, changes in data and measurement methods from one year to another decrease the empirical value of time comparisons. The challenge, and the reality, is that sophisticated, benchmark covering, climate-related risk data is not sufficiently available. We have chosen to accept that the data is less than perfect and to work with what is reasonably available. Use of 80/20 rule: we aim to get the direction and trends of risks correct.

Carolus Reincke, Head of Multi-Asset Solutions, Mandatum Life Investment Services

We see two particular challenges at this time. The first is that data quality across all scopes is still lacking, with a lot of modelled data. Scope 3 is particularly far behind and still far from being of such a quality where it can be used coherently. The second is that the blind use of CO₂ numbers is an inherent risk, and can lead to a bias against companies or products that, over a lifetime, can help reduce CO₂ emissions.

Bård Bringedal, Chief Investment Officer, Equities, Storebrand Asset Management

As things stand, we consider that adopting quantitative decarbonization targets may lead to biased investment decisions. However, we are strongly committed to foster research in this area, notably by using and questioning current carbon footprinting methodologies, working with our asset managers on portfolio decarbonization approaches, disclosing the results of our work on these areas, engaging with companies on carbon disclosure, and working with experts to determine ERAFP's investment climate-related risks and opportunities.

At the end of 2016, ERAFP launched a call for tenders to broaden the risk and opportunities analysis for its climate change asset portfolio. Following this procedure, a number of specialised companies were selected. Trucost, in partnership with I Care & Consult, Grizzly Responsible Investment and Beyond Ratings, were appointed to analyse the equity and corporate bond portfolios, while Carbone 4 was selected to analyse the real estate, private equity and infrastructure portfolios.

Pauline Lejay, Head of SRI, ERAFP

WHAT ARE THE FINANCIAL AND ENVIRONMENTAL IMPACTS OF PORTFOLIO DECARBONIZATION?

We can assess the impacts of PDC signatories' portfolio decarbonization efforts in three broad ways:

1. In terms of their portfolio exposures to climate-related risks and opportunities.
2. In terms of their financial (or investment) performance.
3. In terms of the impact that these efforts have on real world decarbonization, in terms of immediate GHG emissions reductions or in terms of altering capital expenditures in the real economy.

PORTFOLIO EXPOSURES TO CLIMATE-RELATED RISKS AND OPPORTUNITIES

There is clear evidence that decarbonization efforts improve the carbon characteristics of investment portfolios and funds, please see the box below. This is unsurprising; many of the targets that PDC signatories have set for themselves explicitly

focus on reducing portfolio-related greenhouse gas emissions and portfolio-level carbon intensities as an avenue to reduce transition risk exposure, and their strategies have been directed at delivering on these targets.

Examples of Portfolio Decarbonization Outcomes

- ABP: At the end of 2016, the CO₂ footprint, measured in emissions per Euro invested, of ABP's listed equity portfolio was approximately 16% lower than in ABP's reference year of 2014.
- Australian Ethical: The carbon footprint of Australian Ethical's listed equities investments were assessed as having a third (34%) of the carbon footprint of its reference benchmark (a blend of S&P ASX 200 and MSCI World).
- CDC: The carbon footprint of CDC's listed equity portfolio declined from 0.452 te CO₂e per thousand Euros invested at 31/12/2014, to 0.332 te CO₂e per thousand euros invested at 31/12/2016.
- ERAFP: At the end of 2016, ERAFP's portfolio had a carbon intensity that was 17% lower than its benchmark, the MSCI World.
- FRR: At the end of 2016, the carbon intensity – expressed in terms of the emissions per million Euros of turnover of the companies in the portfolio – of FRR's equity portfolio was 28.9% less than that of its benchmark index. Furthermore, the emissions per Euro invested in the FRR's portfolio were 28.4% lower than the benchmark index.
- FRR: Between 2013 and 2016, the FRR's portfolio reduced its carbon footprint by 37.5%, whereas the benchmark fell by just 17.6%.
- Hermes: On a like-for-like portfolio basis, Hermes reduced the emissions from its real estate portfolio by 8% per annum in the period from 2006 to 2016.
- Local Government Super (LGS): At 31 December 2016, LGS's Australian equities portfolio had 0.2% lower carbon emissions (in terms of greenhouse emissions per dollar invested) and its international equities portfolio had 16% lower carbon emissions than their respective benchmarks.
- Mandatum: In 2016, the carbon intensity of Mandatum's equity investments was 26% less than the relevant benchmark with the carbon intensity of its fixed income and balanced assets investments being 58% and 78% less than the carbon intensity of their relevant benchmarks.
- Öhman: The average carbon footprint of Öhman's listed equity funds reduced by 17.4% from 2015 to 2016.
- University of Sydney: As 30 September 2016, the University's listed shares portfolio had a 28.4% lower carbon footprint than the weighted average of its benchmarks.

FINANCIAL (OR INVESTMENT) PERFORMANCE

To date, there is limited quantitative evidence from PDC signatories that their portfolio decarbonization efforts have enhanced investment performance. A notable exception is Local Government Super which reports that it has added 7bps to the MSCI World ex. Australia Index as a result of introducing a new high carbon screen in November 2014. This absence of quantitative information is unsurprising given that portfolio decarbonization is a novel activity, and that the financial benefits would be expected to accrue over the longer rather than the shorter term.

There are, however, three important insights that can be drawn from the experience to date. The first is that investors seeking to track major investment indices can achieve the same investment performance with significantly lower carbon footprints. For example, FRR, Amundi, AP4 and MSCI, have developed the MSCI Low Carbon Leaders Index which, through excluding high emitting companies and companies with large fossil fuel reserves, aims to have at least a 50% lower carbon footprint than the relevant parent index.

The second insight is that decarbonized portfolios offer potentially significant long-term investment benefits, including a reduced risk of value impairment because of climate change-related regulation, reduced risk of assets being stranded and increased exposure to the companies that are likely to be the beneficiaries of the transition to a low carbon economy.

The third is that decarbonization provides organisational benefits. For example, BNP Paribas Asset Management's carbon monitoring tool helps it prioritise companies for engagement, CDC's decarbonization strategy has built awareness, knowledge and capacity within the organisation, and the Church of Sweden's decarbonization activities have built its credibility and reputation, and demonstrated that high returns are compatible with high ESG performance and a progressive climate strategy.

Our decarbonization activities benefit both the environment and our financial performance: By investing our clients' capital in growth markets like renewable energy or green property globally, we enable the transition to a low-carbon and cleaner economy and de-risk our investment portfolio from high-carbon assets.

Günther Thallinger, Member of the Board of Management, Allianz SE

Our work in the area of portfolio carbon footprinting and decarbonization has provided us with a broad picture of the different available methodologies and their respective loopholes and biases. We think it is a necessary step to build robust tools which will be then used to develop the most efficient decarbonization strategies.

Pauline Lejay, Head of SRI, ERAFP

CASE STUDY: LOCAL GOVERNMENT SUPER AND THE BENEFITS OF DECARBONIZATION

LGS has identified the following as benefits of its decarbonization efforts:

- **Awareness-raising:** By integrating climate risks into its Strategic Asset Allocation review, LGS is able to engage the LGS Board, Investment Committee and Investments Team on the risks and opportunities associated with climate change. As a result, it has allocated significant funds towards low carbon mandates. By introducing an investment restriction on high carbon activities LGS have also been able to raise awareness about the positive financial benefits from lower exposure to fossil fuels.
- **Capacity-building:** By broadening its risk universe to incorporate climate change impacts and building capacity within the internal investments team and external fund managers, LGS is better placed to ensure returns are maximised for members.
- **Better data:** By working with MSCI ESG research, LGS has been able to source comprehensive data on company emissions, enabling it to make more informed decisions when looking at engaging with companies and decarbonizing our portfolio.
- **Reputational benefits:** LGS achieved number one ranking globally in the 2017 'Global Climate 500' index by the Asset Owner's Disclosure Project as a result of its continued commitment to decarbonization and disclosure on climate risk management.

Our climate change risk and opportunity analysis have enhanced our engagement with stakeholders, and enhanced our dialogue with external investment managers. They have also stimulated interest in the opportunities presented by climate change, which we expect to lead to increases in our allocations to investments that facilitate a lower carbon economy, in turn expected to provide diversification and long-term risk adjusted returns.

Univest Company

WIDER ENVIRONMENTAL IMPACTS

Despite the reduced portfolio exposures to climate-related risks, the increased portfolio exposures to climate-related opportunities, and the improved investment performance, there is limited information on how the efforts of PDC signatories are affecting the real economy, as measured in, for example, physical greenhouse gas emissions, the diversion of financial flows in the real economy, or the share price of high emitting or high impact companies. This absence of evidence is unsurprising: portfolio decarbonization is a new activity and it will take time for high level portfolio commitments to translate into tangible on-the-ground changes. It is also likely to be a function of scale in that it may require many more investors to make decarbonization commitments before impacts can be reliably detected and analysed.

The absence of tangible evidence also reflects the manner in which investors are setting decarbonization targets and, in turn, taking action to deliver these targets.

When we look at **engagement**, we see relatively little explicit ex ante target setting on the emission reductions that are being sought or on the actions that are to be taken by the engaged investee. Similarly, we see relatively little ex post analysis of the outcomes achieved (e.g. the actual emission reductions achieved, the actions actually taken) or of the effectiveness or success of the engagement (e.g. what did investors do, how did the target of the engagement respond, what would have happened in the absence of engagement, how did investors react to a lack of response and/or compliance).

We see similar issues when we look at the influence of **investment decision-making** on anthropogenic greenhouse gas emissions. It is not clear that the decisions being made by individual investors (e.g. to over or underweight specific companies, to divest from specific sectors), even if they reduce the emissions associated with the investor's portfolio, have an effect on companies' emissions. To have an effect would require that these decisions either (a) materially affect companies' cost of capital and so alter the economics of its

Our carbon foot-printing efforts have helped increase the level of in-house awareness on carbon emissions. Portfolio managers that were not at all aware of the climate impact of their investment decisions now better understand this impact and how they can reduce carbon emissions linked to their investments. We started with Scope 1 and 2 emissions from our listed equity portfolios but intend expanding this focus to look at wider climate impacts and to look at asset classes other than listed equities.

Thibaud Clisson, Senior ESG analyst, BNP
Paribas Asset Management

business model, (b) send such an unambiguous and powerful signal that the company responds in some way. In relation to the former point, it is worth noting that investor action has been relatively uncoordinated and it is, therefore, difficult to find compelling evidence that investment decisions have made a material difference to companies' cost of capital. A notable exception might be coal mining although this industry faces a variety of structural, political and environmental headwinds which are likely to have been the main drivers of share price and cost of capital.

The other point to be made about investment decision making is that, even for organisations that have made commitments to decarbonization, it is very difficult to tell what decisions are additional to those that would have been taken anyway. This is a common issue in voluntary approaches, where participants' pledges reflect the actions that they would have taken anyway or the changes that would have occurred anyway (e.g. investors can be confident that a certain amount of their decarbonization targets will be delivered through the decarbonization of the electricity sector that we are seeing in many countries).

MAKING PROGRESS

The central findings from this report are that:

- Investors that commit to portfolio decarbonization can achieve a variety of benefits, including improving the carbon characteristics of their investment portfolios and funds, increasing their exposure to climate-related investment opportunities and improving their investment performance.
- There is much more work to be done if portfolio decarbonization is to have a real impact on wider society.

PRIORITIES FOR ACTION: INVESTORS

Despite the progress that has been made and the leadership that has been shown by PDC signatories, investors looking to decarbonize their portfolios still face substantial challenges in relation to the availability of information, the availability of tools and methodologies, and their understanding of the most effective decarbonization strategies.

In the 2016 PDC annual report, we identified 14 priority areas for action. In the survey that has underpinned this report, we asked PDC signatories to indicate which of these was most important. The responses allowed us to divide these into three groups (see Table 4): those that more than two thirds of respondents saw as a high priority, those that more than 50% saw as a priority, and those that less than 50% saw as a priority. The results are presented in the Table below.

Table 4: Priorities for Action

Identified as a high priority by more than two-thirds of survey respondents	
Broad objectives yet to be accomplished	Specific investor needs
Providing investors with information that they need	Improving company disclosures on Scope 1 and 2 emissions
Providing investors with information that they need	Improving company disclosures on forward-looking, scenario-based risk and opportunity assessments
Helping investors to assess and quantify climate risk	Developing or improving transition risk measurement and assessment methods for investors
Helping investors to act on climate change	Share expertise and solutions
Identified as a high priority by more than half but less than two-thirds of survey respondents	
Broad objectives yet to be accomplished	Specific investor needs
Providing investors with information that they need	Advocating for mandatory, standardized corporate disclosure schemes on climate-related risks and opportunities
Helping investors to assess and quantify climate risk	Developing climate-related (science-based) target-setting frameworks for investors
Helping investors to assess and quantify climate risk	Developing investor guidance to assess and quantify transition risk exposure

Identified as a high priority by less than half of survey respondents	
Broad objectives yet to be accomplished	Specific investor needs
Providing investors with information that they need	Improving company disclosures on Scope 3 emissions
Helping investors to assess and quantify climate risk	Assessing the impact of climate engagement and advocacy activities
Helping investors to assess and quantify climate risk	Developing climate-related, standardized disclosure frameworks for investors
Helping investors to assess and quantify climate risk	Advocating for mandatory climate-related, standardized disclosure frameworks for investors
Helping investors to assess and quantify climate risk	Developing a standardized climate-related disclosure framework for investors
Helping investors to act on climate change	Developing an agreed logic and guidance on how investors (can) contribute to the low-carbon economic transition
Helping investors to act on climate change	Developing evidence on how investors' climate strategies (can) contribute to the low-carbon economy

Most of the metrics that are available for measuring climate risk are backward-looking. We are actively looking for a set of metrics with a more forward looking nature to complement the existing metrics used to measure climate risk of our portfolio.

Erik Jan Stork, Fiduciary Manager Responsible Investment at APG Asset Manager, ABP

The fact that there are foreseeable and needed improvements to CO₂ data should not be an impediment for no action. Learning by doing is essential, and investors and the financial sector should start this learning curve as soon as possible.

Laurent Jacquier-Laforge, CIO Equity, La Francaise Inflection Point

We have worked extensively on measuring the carbon footprint of our portfolios. Although we have gained in knowledge, we realise that we need to move from carbon footprinting to climate risk assessment, including scenario analysis.

Helena Vines Fiestas, Head of Sustainability Research and Policy, BNP Paribas Asset Management

PDC's signatories agree that collaborative initiatives play a key role in capacity-building and in supporting the development of decarbonization tools and methods. In their responses to the survey, PDC signatories pointed to the importance of investors working together to develop tools for portfolio carbon assessment and for scenario analysis, which in turn will assist investors to report in line with the TCFD's recommendations. Both of these areas require significant work, both in terms of developing the tools and in ensuring a degree of consistency (e.g. in relation to underlying assumptions) to enable them to be useful to investors and to stakeholders looking to understand how institutional investors are managing climate-related risks and opportunities.

Given the volume and variety of reporting being expected of asset owners and asset managers, we need to work together to develop common reporting frameworks and methodologies.

Yves Chevalier, member of FRR's Executive Board

PDC should continue to focus on developing and providing a decarbonization toolbox. The sector needs analysis tools and metrics, approaches to do scenario-based analysis as well as improved data availability – the PDC is well positioned to take a lead role.

Thomas Liesch, Senior Project Manager, Allianz Climate Solutions GmbH

We need a particular focus on how investors might apply 2 degrees scenarios to their risk mitigation and adaptation strategies.

Bruce Duguid, Engagement Director, Hermes Investment Management

PRIORITIES FOR ACTION: WIDER SOCIETAL IMPACTS

Ensuring that the efforts of individual investors to decarbonize their portfolios deliver wider benefits to society or have a material impact on global greenhouse gas emissions, is a major challenge. It will require that substantial progress is made on each of the priorities outlined above. But it will also require a much more forceful and assertive approach to decarbonization, from individual investors, from the investment community as a whole and from those initiatives, such as PDC, that are working to encourage and support decarbonization.

The parameters of this challenge are yet to be fully defined but this report points to five headline conclusions:

1. Engagement must be much more outcome oriented. That is, individual and collective engagement initiatives should:
 - Be explicit about the outcomes they wish to achieve.
 - Align with science-based targets or with the goals of keeping global temperature rise below 2 degrees Celsius.
 - Be clear about their additionality or what they are delivering above and beyond what would have happened anyway.
 - Commit to formally, regularly and publicly reviewing the outcomes that they have achieved, and be prepared to escalate if their goals are not being achieved.
2. Engagement must be conducted at scale, bringing the leverage of large numbers, or of significant proportions of a company's investors to bear.
3. Investment decision-making must be explicit. Investors must explain how climate change is factored into their investment decision-making, and they must explain the role played by climate factors when making investment, divestment and over/underweighting decisions. This signalling is critical in enabling companies and other stakeholders to see and understand the factors driving investment decisions.
4. Investors must work together. Unilateral commitments to divestment, for example, have limited impact on companies' share prices or cost of capital.
5. Decarbonization must be about additionality. Investors must explain how the actions they are taking are additional to those actions that they would have taken anyway.

TCFD

In our survey, we asked PDC signatories three questions about whether, and if yes how, TCFD might affect their approach to portfolio decarbonization:

Do you think that the TCFD framework will be helpful in improving the availability of data needed to inform investors' decarbonization strategies and decisions?

Almost all of the respondents (23 out of the 24 that answered this question) agreed that the TCFD framework will be helpful in improving the availability of data needed to inform investors' decarbonization strategies and decisions. There was particular interest in the potential for companies' to provide more forward-looking data, and analysis that goes beyond assuming that current regulatory and technological circumstances will continue to persist into the future.

Some respondents did however caution that the value of reporting in this way will depend on whether the requirements are actually implemented and followed by corporations. The respondents also pointed to the importance of other reporting initiatives aligning with the TCFD, thereby helping to reduce complexity, and enhance comparability and transparency.

The TCFD framework will probably help to improve data as it provides a sort of "standard" framework about how asset owners, asset managers and banks approach climate risk. That will help investors and other stakeholders to identify how the different organisations work and how they handle climate risk.

Niklas Ekvall, CEO, AP4

The TCFD recommendations are a major step toward global standardization of environmental disclosure within one set of guidelines. The TCFD recommendations can help drive the integration of climate data into mainstream financial reporting and facilitate strategy discussions in company boardrooms. The TCFD will make a significant contribution to increasing the quality and quantity of environmental disclosures.

Liz Gordon, Executive Director, Corporate Governance, New York State Common Retirement Fund

We are optimistic that the TCFD framework will improve the availability of climate related data due to the significant and high level support from policymakers and large multinational companies as well as the strong commitment to decarbonization shown by the international institutional investment community to date.

Bill Hartnett, Head of Sustainability,
Local Government Super

Do you think that institutional investors should prepare TCFD-compliant disclosures themselves?

Of the 23 PDC signatories that responded to this question, 17 agreed that institutional investors should prepare TCFD-compliant disclosures themselves. However, respondents noted that standardized approaches and best practices are not available, and that there is a lack of data on how the financial risks of climate change should be assessed or reported against. Some respondents were cautious about the timing, and questioned whether investors should be expected to prepare such disclosures before comprehensive disclosures are available from companies. Respondents also noted that investors may not have the resources to develop their own scenarios and metrics and that there may be a role for collaborative initiatives to support this process.

We welcome the inclusion of assessing carbon risks based on scenario analysis to ensure a broader level of carbon risk disclosure including both a narrative approach and a quantitative carbon footprint reporting. However given a limited knowledge of carbon scenario and scenario analysis, companies and investors will have a steep learning curve to deliver this level of analysis.

Bruce Duguid, Engagement Director,
Hermes Investment Management

It is important for institutional investors to assess and disclose their climate risks and opportunities to ensure they can be effectively managed and to show companies, policy makers and other stakeholders that they take this issue seriously. There are still difficulties measuring climate risks in all asset classes outside listed equities, property and infrastructure due to lack of understanding and awareness by fund managers, lack of measurement framework/methodology and availability of data.

Bill Hartnett, Head of Sustainability,
Local Government Super

We are already required to report under Article 173 in France. This process requires significant investments in time, resources and executive buy-in, in particular when developing underlying processes and methodologies which are not stabilized. Hence disclosure requirements in the short term have to remain flexible and integrate transitional phases to enable institutions to build-up their internal capacities.

Helena Charrier, Responsible Investment (RI) project director, Caisse des Dépôts Group

Institutional investors might lack the data required for a proper assessment of climate risks. Until company disclosures of climate-related information and climate risk metrics have the same quality standards as traditional financial data, strong expertise is needed to assess data quality, provide sound estimates for missing data, and extrapolate overall impacts on an industry-by-industry perspective. Ultimately, for a proper and meaningful assessment, asset-level data and consistent stress testing and scenario analysis will be necessary.

Daniel Wild, PhD, Head of Sustainability Investing R&D and Member of the Executive Committee, RobecoSAM

Do you think that investors systematically disclosing their transition risk exposures will catalyse portfolio decarbonization?

Just 11 of the 24 respondents agreed that investors systematically disclosing their transition risk exposures would catalyse portfolio decarbonization; two respondents disagreed and the remaining 11 were unsure. The primary point of disagreement related to how disclosure influences organisational behaviour and decision-making. Those that agreed with the statement were of the view that the process of measuring transition risk exposure would inevitably lead to a management focus on these issues and increased management awareness. Those that disagreed did so for various reasons. For some, it is the setting and delivery of targets that provides the impetus for action, not the process of disclosure. Some of these respondents suggested that there is a need for explicit requirements for investors to adopt formal targets on decarbonization, rather than simply disclosing their risk exposure. For others, the outcomes depend on how other stakeholders (outside the

reporting organisation) use the information provided. For others, disclosure is just part of a wider process and is usually not the first step of portfolio decarbonization. These respondents noted that investors will analyse and monitor carbon risk metrics, decide on risk management approaches and somewhere in the process decide to publicly disclose the metric and approach; that is disclosure is often also an outcome of ongoing decarbonization, rather than a beginning or an end in and of itself.

While systematic disclosure may not systematically lead to portfolio decarbonization, we believe that it is a first step towards aligning portfolios with the low carbon economy. It will entice investors to take further action. Mandatory disclosure will also increase transparency and in turn, demand for better climate change-related risk management in portfolios. Nevertheless, it is important to note that investors' willingness to disclose transition risks is, ultimately, highly dependent on climate policy. As such, innovative initiatives such as Article 173 have a critical role to play in boosting market mobilization across the globe.

Fred Samama, Deputy Global Head of Institutional Clients, Amundi

As a result of disclosing their transition risks investors, and their trustees, will be under increased scrutiny to ensure they meet their fiduciary duty to address these risks. This may potentially result in decarbonising portfolios and/or increased allocations to low carbon opportunities such as renewable energy generation.

Bill Hartnett, Head of Sustainability, Local Government Super

Investors systematically disclosing their transition risk exposures is a necessary step as it demonstrates that good practice is possible. It will be a positive example that can be highlighted but alone it won't catalyse portfolio decarbonization.

Faith Ward, Chief Responsible Investment and Risk Officer, EAPF (now Chief Responsible Investment Officer, Brunel Pension Partnership)



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