Task Force on Climate-related Financial Disclosures report 2018
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Introduction

The threat of climate change is significant and far-reaching. According to the Intergovernmental Panel on Climate Change (IPCC), even 2°C of global warming above pre-industrial levels would mean catastrophic flooding, drought and associated mass migration, food scarcity and large-scale loss of biodiversity. These changes in turn will disrupt supply chains and damage infrastructure.

The resulting economic damage from unmitigated climate change is difficult to precisely quantify over decades. But the warning signs are unmistakable. Since the 1980s, the number of weather-related economic losses has tripled. Without swift action, this trend is likely not just to continue but to accelerate, with the scientific community warning of potential ‘tipping points’ after which global warming will become self-amplifying.

At Legal & General Investment Management (LGIM), we understand that our scale brings the responsibility to act decisively on climate change. As an institutional investor responsible for managing the retirement savings and investments of millions of people, we believe climate change is one of the biggest market-wide risks we face and strongly support the stated aim of the Paris Agreement of limiting global temperature rise to well below 2°C, converging on a 1.5°C pathway.

The money we manage on behalf of our clients is invested in the financial market as a whole, covering all sectors and regions. For this reason, we must take a comprehensive approach to climate change. It must encompass not only our own products and investment activities, but also using our voice as one of the largest global institutional investors to push for urgent action from both governments and the companies that we own.

As an asset manager and part of a publicly listed parent, Legal & General plc (L&G), our response to the Task Force on Climate-related Financial Disclosures (TCFD) recommendations is written for different stakeholders.

Firstly, L&G shareholders increasingly seek to understand how we, as an investment manager of internal and external assets, manage climate-related risks and opportunities in our investment offerings. L&G has separately produced a TCFD-aligned document which outlines the overall carbon footprint of the business, including its approach to decarbonising internal assets.

Secondly, this report is written for the millions of customers who are invested in LGIM funds globally. Our aim is to demonstrate how we are helping to safeguard both their investments and actively creating investment solutions that protect their future.

The intention of this report is to reaffirm our belief that companies should disclose climate-related financial information. In our view, companies should not use the voluntary nature of the TCFD recommendations – or the lack of perfect information – as an excuse to ignore the issue. To the companies we invest in, we want to show that this is a vital conversation they should be part of. To regulators and policy-makers, we want to demonstrate that this framework can be implemented with more legal backing and standardisation going forward.

The window to opportunity to finance an orderly transition to a low-carbon economy is closing fast; all actors in the investment chain must play their part in building a sustainable future.

Source: Bank of England
ABOUT LGIM AND THE TCFD RECOMMENDATIONS

LGIM is the investment management arm of Legal & General Group, a FTSE 100 company. LGIM is one of Europe’s largest asset managers and a major global investor, with assets under management of £1.015 trillion (US $ 1.293 trillion), as at 31/12/2018.²

We offer strategies across the full spectrum of asset classes, including equities, bonds, real assets, as well as multi-asset strategies and liability-driven investments tailored to the needs of institutional and retail investors. This report explores how climate risks are pertinent to different asset class and investment strategies.

Most importantly, we manage assets on behalf of our clients. Our responsibility is to recognise material risks and opportunities for each of the client types and provide appropriate investment solutions that help meet their financial goal. The client and investment types are broken down as below:

![Chart 1: Assets under management (AUM) breakdown](chart1.png)

Source: LGIM, as at 31/12/2018*

![Chart 2: AUM by investment types (billion GBP)](chart2.png)

Source: LGIM, as at 31/12/2018*

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² LGIM internal data as at 31 December 2018. *These figures include assets managed by LGIMA, an SEC Registered Investment Advisor. Data includes derivative positions. Total assets may not sum to AUM due to derivatives positions.
The majority of our assets (50%) are in the Solutions investment type. LGIM provides a range of pooled and bespoke solutions to help de-risk defined benefit pension schemes. These solutions will usually combine active or passive underlying portfolios with derivative overlays designed to meet clients’ specific requirements. Solutions also includes a range of pooled multi-asset funds for retail and institutional clients, built using LGIM’s expertise in asset allocation which is informed by an in-house research capability. The underlying asset classes may be managed on an active or passive basis within LGIM. An allocation strategy service is also offered to institutional clients, which may also allocate some of the portfolio to managers other than LGIM.

To demonstrate further on where most of our assets are concentrated, index funds are broken down into asset classes and fixed income funds are broken down by the type of bonds and their investment strategies:

**Chart 3 Index funds breakdown**

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equities</td>
<td>70.6%</td>
</tr>
<tr>
<td>Corporate bonds</td>
<td>6.3%</td>
</tr>
<tr>
<td>Government bonds</td>
<td>2.55%</td>
</tr>
<tr>
<td>Aggregate bonds</td>
<td>0.5%</td>
</tr>
</tbody>
</table>

Source: LGIM internal data as at 31 December 2018

**Chart 4 Fixed Income Assets**

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active Aggregate</td>
<td>52.39%</td>
</tr>
<tr>
<td>Active Corporate</td>
<td>14.24%</td>
</tr>
<tr>
<td>Active Government</td>
<td>6.82%</td>
</tr>
<tr>
<td>Index Aggregate</td>
<td>23.55%</td>
</tr>
<tr>
<td>Index Corporate</td>
<td>7.28%</td>
</tr>
</tbody>
</table>

Source: LGIM internal data as at 31 December 2018
CLIMATE CHANGE – A SNAPSHOT OF RISKS AND OPPORTUNITIES

The effects of climate change on investments can be divergent, depending on the asset classes and the timeframes used. Broadly, we recognise two main types of risk: physical and transition risks.

Physical risks are driven by inaction, as extreme weather is allowed to intensify. This can affect the value of investments both directly (e.g. real estate flooded by rising sea levels) and indirectly (e.g. through changes in insurance premiums). Impacts will not be uniform, (e.g. agriculture in temperate or arid areas benefiting from increases in temperatures or rainfall).

Transition risks are driven by action, as changes in policy, technology and consumer preferences put the world economy on a low-carbon trajectory. It has been estimated that around a third of the world’s equities and bonds are linked to high-carbon sectors whose value could fall during this transition\(^3\).

On the opportunity side, an estimated $2.4 trillion of annual energy investment over the next two decades would be needed to keep global warming below 2°C\(^4\). Investors who reflect the dynamics of energy transitions in their portfolios may reap substantial benefits. Far from being a niche segment, the ‘green’ economy is now estimated to be equal in size to the oil and gas sector’s entire market capitalisation\(^5\). The scale of the opportunity invites comparisons with a new industrial revolution.

As a globally diversified investor, we aim to take a comprehensive look at the implications of climate change for our clients’ assets. They range from the overall governance of risks and opportunities down to the level of metrics, targets and product development.

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\(^3\) Source: Bank of England

\(^4\) Source: IPCC

\(^5\) Source: FTSE Russell
Governance

BOARD OVERSIGHT OF CLIMATE-RELATED RISKS AND OPPORTUNITIES

LGIM is part of Legal & General (L&G) Group – our parent company is listed on the London Stock Exchange and is a FTSE 100 constituent. L&G Group has a separate governance structure and committee which oversees climate strategy as it relates to its entire business. This report only describes the oversight within LGIM.

LGIM’s Corporate Governance Committee has overall responsibility and oversight of the evolution and implementation of corporate governance and responsible investment policies, including those related to climate change. These policies apply to all asset classes and investment strategies. Our Chief Executive Officer, Chief Investment Officer and Director of Corporate Governance all serve on this committee, in addition to independent non-executive directors. The Corporate Governance team reports to the committee regularly. The Corporate Governance committee meets quarterly, while the Director of Corporate Governance reports to the LGIM Board every six months.

At the highest level, overall responsibility for climate change risks, insofar as they are material to investments, lies with LGIM’s CEO, who has oversight of relevant risks as reported through a series of risk and investment committees. LGIM’s policy on conflicts of interest is another important channel to ensure that information is communicated in a timely and comprehensive manner. The policy is available on this link.

LGIM has been engaging on the topic of climate change for a number of years as part of the commitment to integrate Environmental, Social and Governance (ESG) considerations in the investment process. Our overarching policy on Responsible Investment can be found on this link.

Owing to the recognition of the far-reaching nature of the climate risks and the global Paris Agreement to act collectively, our climate change policy, as a standalone document, was formally published in 2016. It is updated periodically, and latest version can be found here.

At the same time, we published our first carbon footprint guide and report, available here. This was done to help our clients better understand which risks may be sitting in an average portfolio.

MANAGEMENT’S ROLE IN ASSESSING AND MANAGING CLIMATE-RELATED RISKS AND OPPORTUNITIES

LGIM’s Corporate Governance team is responsible for developing and carrying out our corporate governance and responsible investment activities, including assessing and managing climate-related issues. This dedicated team of 14 professionals has been deliberately built with diverse experience and expertise across the spheres of stewardship and responsible investment.

The Director of Corporate Governance reports directly to LGIM’s CEO, and is a member of the LGIM board and Corporate Governance Committee, ensuring that the overarching climate strategy is endorsed from the top of the organisation. LGIM’s Head of Sustainability and Responsible Investment is responsible for engaging on sustainability and climate themes globally, integrating material risks into the existing investment processes and developing low-carbon investment product solutions.
There is a suite of channels through which climate risks and opportunities can be identified and managed. The diagram below provides an illustration of the different tiers in this governance framework. Throughout this report, climate change considerations should be understood as a key part of the ‘E’ (environmental) component of the ‘ESG’ acronym:

The **Corporate Governance Committee**, discussed above, oversees LGIM’s approach to ESG engagement. As an active owner, LGIM engages with investee companies to promote their long-term success. We will ask their management to provide us with credible evidence of how they are navigating material ESG risks and opportunities. We use our votes as shareholders to hold companies to account and, where possible, we will collaborate with other investors in order to maximise impact. Our annual **Active Ownership** reports provide numerous case studies of positive outcomes at some of the world’s largest companies.

As a long-term investor, we have developed our own house view about the issues which are likely to prove decisive in shaping global markets over the decades to come. **Thematic Working Groups** have been established to undertake top-down research and analysis of macro-economic issues relating to the themes of technology, energy, demographics and politics. These groups consist of credit, equity and multi-asset investment professionals and representatives from the corporate governance team. The outputs of the groups result in asset allocation, portfolio and individual investment decisions.

The impact of climate change and low-carbon technologies represents a key topic which cuts across several of these working groups. Examples of recent research pieces detail our thinking on issues such as peak oil demand, the uptake of electric vehicles and the rapidly deteriorating outlook for coal.²

Our belief that long-term ESG issues such as climate change are not fully priced in by the market is reflected in the development of ESG metrics which are used to allocate an appropriate level of risk at an individual company level, and to add a quantitative lens in support of our engagement. The **ESG Score** is used in our engagements and for creating ESG-aligned index-tracking funds.

² See, for example: [https://futureworldblog.lgim.com/categories/themes/the-end-of-the-road-for-coal/](https://futureworldblog.lgim.com/categories/themes/the-end-of-the-road-for-coal/)
reflecting our minimum standards that companies globally need to meet. Oversight for the rules-based incorporation of this score into index methodologies is provided by the Corporate Governance Committee and the Index Solutions Committee.

Adding an extra level of detail, we have developed the ESG View, used within our actively-managed strategies and to further aid the engagement process. This assists during the process of stock or bond selection by highlighting key ESG issues overlaid onto the fundamental assessment carried by the analysts. These metrics have been designed with direct input by sector analysts and are continuously being improved through regular meetings between the active investment teams (for both equities and fixed income) and the corporate governance team.

At the very core of our ESG capabilities is our Future World range. In 2016, we launched the first fund in this range, which aimed to achieve positive outcomes for the dual purpose of protecting long-term investment returns and taking climate change risks into account. For this fund, which was launched together with the HSBC UK Pension Scheme, LGIM appointed the Future World Advisory Board to oversee its developments over time. The board consists of our CEO, CIO and Head of Sustainability and Responsible Investment Strategy – as well as independent experts Lord Nicholas Stern and Professor Andreas Hoepner. The board meets every 6 months and is responsible for monitoring climate change and the energy transition trends, amongst other responsibilities.

Since 2016, the Future World funds have expanded into investment offerings in every asset class (equity, bonds, real assets and multi-assets) and strategy (active and index tracking funds). Climate change is the most prominent theme that is incorporated in the range, both from a risk perspective and in terms of investing in low-carbon solutions. To ensure that the Future World fund range remains responsive to the latest developments and to create consistent principles, the Future World Investment Group has been set up, led by the Chief Investment Officer, with representatives from all investment desks.

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7 Capital is at risk. Past performance is no guide to future performance.
8 http://www.lse.ac.uk/GranthamInstitute/profile/nicholas-stern/
9 https://people.ucd.ie/andreas.hoepner
Strategy

CLIMATE-RELATED RISKS AND OPPORTUNITIES OVER THE SHORT, MEDIUM, AND LONG TERM

Climate-related risks and opportunities can play out at the security, sector, country and portfolio level to different degrees depending on the timeframe.

In the short to medium term, we believe the net impact may not be significant at the asset allocation level, given that a large proportion of our clients hold a diversified portfolio (across asset class, sector and countries). Over the medium to longer term, we expect physical as well as transitional risks to become much more pronounced. In either timeframe, a significant global shift in regulations could alter market dynamics suddenly.

We must not overlook the fact that the severity of impact would be dependent on the action taken by investors, governments and individuals today. The conclusion of the landmark Stern Review of the economics of climate change was that delaying climate change action becomes more costly over time. Moreover, in the presence of ‘fat tail’ risk, the possibility of catastrophic climate outcomes is not offset by associated low probabilities. When it comes to climate change, being ‘net’ OK is a dangerous comfort to take collectively.

Certain large institutional investors have been referred to as “universal owners”, in virtue of having a stake in every part of the risk and opportunity spectrum. This concept is extremely relevant to the debate as “their highly-diversified, long-term portfolios are sufficiently representative of global capital markets that they effectively hold a slice of the overall market, making their investment returns dependent on the continuing good health of the overall economy”. For this reason, at LGIM, the position communicated to clients and policy-makers in consultations is that failure to decarbonise could carry risks for the whole market, whereby no one is held accountable for the consequences and yet everyone may suffer.

Prescriptions for climate action are often discussed in a binary manner – yes to renewables and no to fossil fuels. This oversimplification does not fully capture the systemic nature of addressing the climate challenge, while meeting the economic demand for energy and resources. The investment solution to such a complex matter has to balance the needs of the future with the requirements of today. The trade-offs are not only across time — as we illustrate below, they sometimes lie within the same sector. While we do not claim to fully solve this issue, we are working with clients to develop optimal strategies that are in the best interest of end investors. Details of how we provide such solutions are outlined in the Risk Management section.

Transition risks
The examples below demonstrate that risks and opportunities often sit in the same sector. The starting point is the main driver of climate change — greenhouse gas emissions, grouped according to whether they are directly emitted by a company or are attributed to it indirectly.

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10 http://www.lse.ac.uk/GranthamInstitute/publication/the-economics-of-climate-change-the-stern-review/
12 UN Principles for Responsible Investment, 2016
Consider the example of a utility company supplying customers with gas and electricity:

<table>
<thead>
<tr>
<th>Table 1 Carbon emissions for Utility ABC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DIRECT</strong></td>
</tr>
<tr>
<td>Scope 1</td>
</tr>
<tr>
<td>Source of emissions</td>
</tr>
<tr>
<td><strong>Utility ABC</strong></td>
</tr>
<tr>
<td>Emissions associated with burning gas to generate electricity</td>
</tr>
</tbody>
</table>

The production process in some sectors – such as steel and cement – is very energy-intensive. The ‘traffic light’ diagram below shows that most of the associated emissions are concentrated in the left part of the diagram, particularly direct (scope 1) type.

<table>
<thead>
<tr>
<th>Table 2 Carbon emissions in cement and steel production</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sector</strong></td>
</tr>
<tr>
<td><strong>Cement and steel production</strong></td>
</tr>
<tr>
<td>Combustion of fossil fuels during production</td>
</tr>
</tbody>
</table>
Some sectors like oil and gas have high emissions across the whole lifecycle spectrum:

### Table 3 Emissions in the oil and gas sector

<table>
<thead>
<tr>
<th>Sector</th>
<th>Scope 1</th>
<th>Scope 2</th>
<th>Scope 3 (upstream/supply chain)</th>
<th>Scope 3 (downstream/product use/investments/end of life)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil &amp; Gas</td>
<td>Emissions from refineries; Emissions from fugitive emissions and flaring; Emissions associated with fuel transport</td>
<td>Emissions from purchased electricity, heat and steam</td>
<td>Emissions associated with equipment and transport</td>
<td>Combustion of oil in transport Combustion of gas in electricity or heating generation Emissions when plastic products are combusted</td>
</tr>
</tbody>
</table>

On the other hand, sectors like banks have very low direct emissions, while having a high concentration in the indirect category:

### Table 4 Emissions in the banking sector

<table>
<thead>
<tr>
<th>Sector</th>
<th>Scope 1</th>
<th>Scope 2 (upstream/supply chain)</th>
<th>Scope 3 (downstream/product use/investments/end of life)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banks</td>
<td>n/a</td>
<td>Some emissions associated with purchased electricity and heating for buildings</td>
<td>Emission associated with employee travel and use of information technology Project/business financing and the facilitation of carbon-intensive sectors or activities</td>
</tr>
</tbody>
</table>
LGIM’s role is to work to reduce or avoid exposure to companies who are at risk of being negatively impacted by changes in costs, regulations, consumer preferences and technological advances. We recognise that we can be an active force in this process, as actions from large investors have the potential to alter the valuation or the cost of capital for some of the major actors involved. It is also our role to spot unrecognised opportunities in companies which are set to benefit from the low-carbon transition.

In all cases, it is important that as a holder of their equity and debt, we encourage companies to reduce emissions along their entire value chain to future-proof their business over time.

To illustrate the actions taken by companies and the market to address the outlined risks, the following table showcases three sector dynamics with real life examples.

**Systemically important emitters**

Systemically important emitters are the largest companies in sectors which are key to meeting climate goals. The total emissions associated with such companies are often comparable to that of developed nations. We believe that the actions these companies take can galvanise further change by setting new standards in their sector. Conversely, inaction by such large players may negatively affect overall market returns.

### Table 5 Risks and opportunities along the value chain

<table>
<thead>
<tr>
<th>High direct emissions (Scope 1) – electric utilities</th>
<th>High indirect emissions (Scope 2) – IT</th>
<th>High indirect emissions (Scope 3) – banks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credit ratings agency Moody’s sees unregulated utilities and power companies with over $504 billion in rated debt as having elevated immediate environmental risks. Such companies are ‘directly exposed to the policy pressure to cut emissions, which continues to disrupt business models and pressure margins in mature economies’. Conversely, many utilities are taking steps to adapt business models to low-carbon generation. In 2018, Scottish Power became the UK’s first vertically integrated utility selling only wind power. This announcement comes as the UK – a major user of coal power as recently as a decade ago – went for the equivalent of two months without burning any coal.</td>
<td>The electricity use of the IT sector is becoming a cause of concern. Globally, data centres are set to have a bigger carbon footprint than the aviation industry. In places which are major bitcoin mining centres, such as Iceland, electricity demand for bitcoin mining may soon exceed household electricity use. Conversely, many IT companies are aware of the issue. Use of artificial intelligence has reduced Google’s use of energy for cooling data centres by 40%, while also improving the efficiency of the wind energy the company generates by 20%.</td>
<td>The Prudential Regulation Authority (PRA), which oversees UK banks and insurers, has outlined different pathways through which physical and transition risks may affect the lending and underwriting activities of banks. For example, electric vehicles are approaching cost-competitiveness with internal combustion engines (ICEs), at the same time as regulatory pressures on ICEs increase. The residual value of ICE cars bought on finance agreements is a growing source of risk, as UK banks’ total exposures to UK car finance is estimated to be around of £20 billion. Conversely, research by Barclays has found that owners of energy-efficient properties are less likely to default on their mortgages.</td>
</tr>
</tbody>
</table>

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13 Moody’s, 2019 - Heat map: 11 sectors with $2.2 trillion debt have elevated environmental risk exposure


Physical risks

Additional risks to our investments that we need to consider come from the physical impact of changes to the weather patterns on companies’ global operations. They may arise from changes in the frequency and severity of ‘one-off’ or rare extreme weather events (such as heatwaves or cyclones), or from long-term changes in climatic trends (water shortages, precipitation and weather patterns, rising mean temperatures, rising sea levels).

**Table 6 Physical risks**

<table>
<thead>
<tr>
<th>Physical risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Damage to assets (e.g. flooded property)</td>
</tr>
<tr>
<td>Increased operating costs (e.g. inadequate water supply for mining operations)</td>
</tr>
<tr>
<td>Reduced revenue (e.g. from health impacts on workforce)</td>
</tr>
<tr>
<td>Insurance becoming more costly (or even unavailable) for at-risk locations</td>
</tr>
<tr>
<td>Reduced productivity (e.g. from falling crop yields in the agriculture industry)</td>
</tr>
</tbody>
</table>

Physical risks are difficult to measure and mitigate, as we are reliant on companies to carry out the necessary assessment of changing weather patterns and disclose the modelled impacts in the public domain. We are also exploring different options from external data providers, modelling physical climate risk, down to the individual asset level (e.g. the use of satellite imagery) and overlaying this with representative assumptions of changes to weather patterns and the availability of water.
THE IMPACT ON THE ORGANIZATION’S BUSINESSES, STRATEGY AND FINANCIAL PLANNING

We see it as our responsibility to provide the right framework to address climate risks and opportunities in every part of our business. While the ultimate decision to choose a specific mandate or portfolio lies with the clients, we are developing the investment process, tools, reports and products to help our clients in their decision-making.

Our ambition is to be on the front foot, not just in responding to demand for sustainable products, but in helping to create demand. In our educational materials, public policy positions and client presentations, we aim to show the opportunities for sustainability within the context of mainstream investing. In our view, this approach is necessary to shift capital at scale towards a low-carbon future.

Our strategy touches on all aspects of the following:

- Engagement and voting
- Integration into the investment process
- Client education
- Public policy
- Product development

Engagement and voting

As a firm, we believe in speaking with one voice across our holdings. For the past two years, climate change has been one of the top three themes discussed by the corporate governance team in meetings with companies. LGIM engages with many of the largest global companies on their management of climate change issues – we do this both directly and collectively with other investors. And we make use of our votes to support our stance.

Looking at key shareholder votes in 2018 in the US, an independent report found that LGIM supported more resolutions on climate change reporting than any of the world’s 10 largest asset managers.20 As mentioned above, we believe it is important to hold companies for account on how they lobby governments on climate change issues. The same report found LGIM have also been a consistent supporter of resolutions calling for disclosure on political lobbying by companies.

We place great importance on collective engagement with other investors as well through forums such as the Institutional Investors Group on Climate Change (IIGCC), the UN Principles for

Responsible Investment (PRI) and Climate Action 100+ (dubbed ‘the world’s largest single-issue engagement initiative’).

Read more about our unique engagement programme – the Climate Impact Pledge – in the Risk Management section.

Integration into the investment process

ESG considerations are fundamental to how we evaluate investment opportunities and seek to protect and enhance the long-term value of our clients’ assets. Close collaboration between the investment and corporate governance teams, with full support from senior leadership, has led to deepening ESG integration into the investment process. Aided by rapid advances in data and analytics, we have been able to apply a quantitative lens to ESG investing across different assets and investment strategies, making it possible to demonstrate to clients how they can begin to address some of the investment risks associated with climate change.

More details on the investment process are described in the Risk Management section.

Client education

One of the key ways we can have a positive impact is by helping our clients, the owners and ultimate beneficiaries of the assets we manage, to take action on climate change.

In 2016, we held our first climate change seminar, with the aim of educating clients on the financial impact of climate change and the tools available to manage the associated risks.

In 2018, we co-wrote and sponsored an investor guide to climate change, published by the Institutional Investors Group on Climate Change (IIGCC). It is a ‘how-to’ guide which intends to support asset owners, trustees and boards in incorporating climate-related risks and opportunities into decision-making. It is a practical tool, providing readers with a series of questions and answers, examples of best practice and useful resources. The aim is to support readers with the implementation of climate change considerations at each step of the investment process, from defining investment beliefs through to asset allocation and reporting (in line with TCFD).


We also use our own communication channels, including our website and the newly launched Future World blog platform, to highlight key climate-related issues. Recent thought pieces by LGIM have covered topics such as the future of carbon capture and storage and the renewable energy revolution. Find out more here: https://futureworldblog.lgim.com/asset-classes/environment-social-and-governance/

21 https://www.responsible-investor.com/home/article/climateaction100_engagement_20/
Public policy

A temperature rise beyond 1.5°C stands to have an adverse impact on our clients’ long-term investments. For this reason we have long emphasised the need for urgent regulatory action. We have done this by engaging collaboratively with other investors and civil society through our membership of the IIGCC and Aldersgate Group, as well as directly with policy makers in the UK and EU. Our aim is to use our position as one of the largest institutional investors in Europe to advocate for meaningful policy action on climate change.

During 2018, LGIM’s CEO joined the UK Green Finance Taskforce and actively pushed for market-wide enhancements. The creation of a Green Finance Institute to help establish London as a green finance hub was one of the recommendations of the report – LGIM’s Head of Personal Investing sits on the board of the newly founded institute.

We have also engaged closely with the EU High-Level Expert Group on Sustainable Finance, providing feedback directly and as an active member of our trade body the Investment Association’s Sustainability and Responsible Investment Committee. Our recent publication called on EU regulators to improve the state of climate-related disclosures, in line with the TCFD.22 We have taken similar positions with UK financial regulators.

LGIM is a member and board member of the IIGCC. Through the IIGCC, LGIM has repeatedly signed collaborative investor letters to the governments of the G7 and G20, calling for urgent action on climate change. The first letter, signed in 2015, urged G7 ministers to support the inclusion of long-term emissions reduction goals in the Paris Agreement. In 2017, the investor group again wrote to G7 and G20 governments, calling on them to maintain momentum on climate change action and to fully implement the Agreement. We reiterated our call in 2018 as signatories of the ‘Global Investor Statement on Climate Change’, released in the run-up to the annual UN climate change conference.

In 2018, we participated in consultations with the Hong Kong Green Finance Association on developing best-practice for corporate climate-related disclosure in Hong Kong and mainland China. We also responded to the UK Department of Work and Pensions’ consultation on trustee responsibilities earlier this year, calling for regulators to recognise the integration of financially material ESG issues, including climate change, as a core component of fiduciary duty. The UK government has since mandated more disclosure in this area.

In parallel to working with companies to encourage them to improve climate disclosures, we believe regulators have an essential role to play in improving the availability of data. We called on the International Organisation of Securities Commissions (IOSCO), the global standard-setters for securities, to raise the bar on climate disclosure. In December 2018, IOSCO responded positively; issuing a statement on the materiality of ESG information, including on climate change.

This comes in addition to our ongoing support for the TCFD. LGIM also offered feedback to the Task Force during the development of the recommendations, and was the largest asset manager to support the recommendations publicly upon their initial release in June 2017.23

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22 See, for example: https://documentlibrary.lgim.com/documentlibrary/literature.html?cid=79834
23 https://preventablesurprises.com/publications/blog/emissions-and-omissions-the-missing35-on-climate-action/
Product development

We have also launched a number of products (index, active fixed income and equity, multi-asset), which incorporate climate metrics and help our clients reduce the carbon intensity of their investments. These are described in greater detail in the next section.

Importantly, we have put in place a process to ensure the governance of climate-related risks and opportunities is embedded into all products managed by LGIM.

HOW CLIMATE-RELATED RISKS AND OPPORTUNITIES ARE FACTORED INTO RELEVANT PRODUCTS OR INVESTMENT STRATEGIES

Having a seat at the table has never been more important. In managing over £1 trillion of assets24, LGIM’s scale confers influence with companies and broader society. To us, ESG and long-term thematic thinking are connected at the hip and create value for our clients and society, with climate considerations sitting at the heart of this approach.

LGIM offers both index and active strategies for listed equities and fixed income products. The main difference between them is that for index funds, the clients choose the index which they wish to follow, while for active funds, portfolio managers have the discretion to pick the securities to incorporate into the fund within the given portfolio guidelines.

Climate in an index approach

Index funds by their nature offer an investor diversification, often tracking market-capitalisation-based indices. However, diversification cannot completely eliminate risks. If the market fails to address climate considerations, especially those which stretch beyond most investors’ time horizons, then investors subscribing to the index approach may collectively lose out. As researchers from the University of Cambridge point out in their study Unhedgeable risk, there are certain transition scenarios in which investors heading towards the ‘low-carbon exit’ may find there are not sufficient volumes and types of assets to diversify into, including low-carbon assets.25

Important considerations when selecting an index whilst seeking to address climate change are:

- Choosing an index that matches the clients’ desire to mitigate risks and benefit from the low-carbon transition over time:
  - LGIM has taken a leading role in the provision of index solutions. The total amount of assets in funds tracking benchmarks with a reduced carbon footprint is at £7.7 billion26
  - LGIM’s proprietary ESG scoring, of which E is based on climate considerations, can be used to create a series of ‘tilted’ equity and bond indices, while maintaining similar risk-adjusted returns. The ESG scores are further explained in the Risk Management section

- Choosing an investment manager that fully utilises the scale of their overall assets under management to hold companies to account using voting rights:
  - LGIM prides itself in maximising the voice of index investors by consistently voting in support of climate-related disclosures and climate actions by companies

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24 As at 31/12/2018. These figures include assets managed by LGIMA, an SEC Registered Investment Advisor. Data includes derivative positions. Total assets may not sum to AUM due to derivatives positions.
25 https://www.cisl.cam.ac.uk/resources/sustainable-finance-publications/unhedgeable-risk
26 As at 06/03/2019. Capital is at risk. Past performance is no guide to future performance.
LGIM’s engagement programme on climate on behalf of its investors is explained in detail in the Risk Management section.

Climate in an active approach

Active funds may incorporate climate considerations through the stock selection process as equity and credit analysts can use bottom-up research to unearth climate risks or unexploited opportunities from the energy transition process.

Some climate-related impacts caused by regulatory changes and technological advances will likely play out over a time horizon which extends beyond that of a typical active fund’s performance objective (mostly between three and five years). Nevertheless, clients choosing an active approach should still make decisions to invest geared towards the transition to a low-carbon economy and achieving the below 2°C climate trajectory.

Some active funds are managed against a particular benchmark. Investors choosing this active fund approach should look for a benchmark index which has been constructed in a manner that is consistent with a transition to a low-carbon economy and seeking to achieve the below 2°C climate trajectory. Investors in active funds which are not managed against a benchmark and integrate an outcome-orientated approach should ensure all investment decisions are consistent with a transition to a low-carbon economy and seeking to achieve the below 2°C climate trajectory.

LGIM offers active strategies that explicitly address climate considerations in equities and credit, seeking to address long-term themes and opportunities whilst managing the risks of a changing world.

ASSET CLASSES

Listed equities and credit

Equities are inherently riskier than bonds, but climate-related considerations, for example the impact of new environmental regulations on a company, can manifest themselves for both equity and bond holders, albeit it at different degrees.

If new regulations impose a large financial burden on a company, this negative pressure on the equity side (e.g. lower share price or cuts in dividends) is likely to be correlated with negative pressure on the credit side (such as the reduced ability to repay debt). An example of this is Pacific Gas & Electric, which filed for bankruptcy due to climate-related bushfires in California, impacting both equity and bond holders.

Research from Morgan Stanley shows that the average shareholder loss one year after a major ESG incident is over 64% (such as the Dieselgate emissions scandal or the Deepwater Horizon oil spill). Bondholders are also starting to factor in climate-related risks to assess the future value of the capital they are lending, on top of the predictability of generating future cashflows over the lifetime of that bond.

All the major ratings agencies have been explicit about the relevance of the topic, enough to warrant credit managers taking such considerations seriously in their portfolios.

Ratings agency Standard & Poor’s found that environmental and climate risk issues were materially relevant to 717 cases between mid-2015 and mid-2017, leading to a downgrade in almost half of these cases. In 2018, Moody’s said 11 sectors with over $2 trillion in rated debt had ‘elevated environmental risk exposure’. As of 2019, Fitch Ratings say that 22% of their

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28 https://www.spratings.com/documents/20184/1634005/How+Environmental+And+Climate+Risks+And+Opportunities+Factor+Into+Global+Corporate+Ratings+--+An+Update/5119c3fa-7901-4da2-bc90-9ad6e1836801
current credit ratings are influenced by ESG factors, with 3% of ratings influenced by a single E, S or G factor.\textsuperscript{30}

In terms of investment opportunities, LGIM is also an investor in green bonds.

LGIM applies its proprietary ESG tools to all appropriate asset classes. We recognise that there are limitations to the data — in both equity and debt, especially for smaller companies. We have therefore been vocal in asking companies to provide more and consistent disclosure across the investment spectrum.

**Government bonds**

Government bonds make up a large proportion of LGIM’s assets. Climate impacts can manifest themselves when a country’s ability to pay back its debt is weakened due to climate considerations, such as large-scale floods, droughts and storms. That is why the ratings agency Moody’s, amongst others, are explicitly incorporating physical risks into their government bond rating process.\textsuperscript{31}

In order to assess countries’ vulnerability to such risks, LGIM developed the ESG Country Score, which incorporates climate considerations. Vulnerability to climate risks is weighed against the resilience of existing infrastructure and a country’s ability to respond through financial and fiscal means (e.g. raising taxes to build flood defences). Our scores highlight that emerging market countries which are both heavily reliant on agriculture and particularly prone to extreme weather are particularly vulnerable. The country score includes climate change exposure and sensitivity, total country greenhouse gas emissions, as well as exposure to water and heat stress. This provides our investment team with additional useful information for issuers that are potentially more exposed to climate-related risks.

The vast majority of the sovereign debt LGIM holds is UK gilts and US treasuries. Though we observe an increase in the impacts of natural catastrophes in many parts of the US – which may have impact on municipal bonds – we believe that the effects of climate issues on the creditworthiness of these two governments are not yet pronounced.

**Multi-asset**

Our Asset Allocation team, which oversees LGIM’s multi-asset funds, deploys both index and active strategies. As such, the multi-asset funds are able to enjoy the benefits of the ESG engagement and analysis undertaken for these investments. In addition, the consideration of material ESG risks is incorporated into the asset allocation process.

We have also established a range of Future World multi-asset funds that explicitly integrate ESG considerations into their strategy, primarily through the use of Future World index funds as building blocks.

**Real Assets**

At LGIM, we are the third largest landlord in the UK through our property investments. Our infrastructure division is a major UK investor in renewables, with £1.1bn invested to date.\textsuperscript{32} Some of the large renewable energy infrastructure transactions that we have financed include what will be the largest offshore wind farm in the world, at Hornsea Project One.\textsuperscript{33}

Our commitment to sustainability is driven by the recognition that the built environment has a significant impact on UK society and its ecosystem, including contributing to almost half of the UK’s greenhouse gas emissions. It is our belief that sustainability already sits alongside location, tenant,
building size and building quality as a key factor in real estate’s value and performance, and its importance will only increase over time.

Our acquisition process includes a stringent set of risk assessment metrics related to the sustainability of assets. Acute and chronic physical risks of investment buildings are assessed throughout the asset’s lifecycle. In addition, all new assets go through a climate risk screening process which includes flood risk, exposure to high winds and storms, energy security (such as multiple points of supply, stand-by generation or battery backup) and availability of electricity capacity for items such as future increased cooling needs or electrical vehicle charging points. Such risks are often included and valued in an asset’s lifecycle plan before purchase, and risk mitigation measures are incorporated in planned maintenance, tenant refurbishments and landlord refurbishment plans. A number of comprehensive initiatives have been put in place to strengthen our real assets portfolio as outlined below:

- An Asset Sustainability Plan is established for each property under management, coordinated with already planned maintenance and refurbishment plans, in order to reduce GHG emissions
- Our quarterly sustainability report reviews performance against best-practice emissions targets, ensuring that all properties are within the upper quartile of the Better Buildings Partnership’s Real Estate Environmental Benchmarks (REEB)
- We include sustainability-related key performance indicators in employees’ appraisal targets and property supplier contracts.
- Our policy is for all managing agents to purchase 100% renewable electricity
- We have had ‘green’ clauses in our standard leasing agreements since 2011
- All new developments, and, where possible, major refurbishments must have the Building Research Establishment Environmental Assessment Method (BREEAM) rating ‘excellent’

We also benchmark all properties against best-practice carbon emissions standards and are currently undertaking an exercise to identify the costs of ensuring each property’s energy performance is aligned with a below-2 °C scenario. This exercise will allow us to identify any assets which cannot be adapted to a 2°C pathway and may potentially be at-risk investments in the absence of upgrades or retrofitting.

Going beyond property investments, we recognise that infrastructure is an asset class deserving separate consideration. Many of the direct physical impacts of climate change have the potential to negatively affect infrastructure – e.g. through flooding. On the opportunity side, improving climate resilience is likely to result in significant capital inflows into infrastructure (e.g. flood defences). We are also developing an ESG scorecard that would assess the climate change impacts of all potential infrastructure investments.

We are committed to continuing our deployment of renewable energy and power grid infrastructure as our infrastructure product offering grows. We are also looking to pilot ‘smart grids’, using battery technology linked to electric vehicle-charging stations and photovoltaic panels to optimise when our properties draw power from the grid, and when they release power back into the system.
LGIM engages directly with companies and policymakers globally to ensure that the market transitions to a low-carbon economy in an orderly manner. The first step is identifying the industries which contribute the most to global greenhouse gas emissions and therefore require urgent action.

Beginning with the biggest contributors to global greenhouse gas emissions (left side of chart), we focused on sectors which need particular attention from the point of view of protecting overall market returns. These are energy (namely oil and gas, utilities and mining), transport (automobile...
manufacturers) and finance and food retail (two sectors which are not always discussed in a climate context). Agriculture is a significant source of emissions, but is often overlooked due to the low levels of direct exposure by investors. We put the onus on food retailers to address this issue from a supply chain perspective. Further detail on this engagement programme is explained in the next section.

More information on engagement is in the following sections. Public advocacy is addressed in the Strategy section above

The level of emissions is an obvious starting point, but there are many other long-term trends, such as automation, digitalisation and electrification that are relevant in the climate context. LGIM has therefore focused on the establishment of long-term themes, sector implications and house views on energy transitions. The long-term thematic groups provide an important opportunity to exchange information and views on evolving sector dynamics that will affect investment decisions — including impacts and developments resulting from climate change. The outputs of the groups result in asset allocation, portfolio and individual investment decisions.

Additionally, sector-level risks resulting from climate change are identified by observing the trends of industries and comparing them with a carbon budget according to the Paris Agreement. The robustness of energy demand and supply assumptions is stress-tested against different low-carbon scenarios (for which we have been developing a proprietary energy model) and through internal discussions in the thematic groups.

See more on energy modelling and long-term themes in the next section

While we conduct detailed sector analysis, we also believe that there are minimum ESG standards that companies should meet, irrespective of sector. Companies which do not meet these standards — including on the level of transparency with regards to their disclosures, may represent a potential investment risk. These are identified and mitigated through our ESG Score.

Company-level risks are identified by assessing how each company is positioned to benefit or lose out from both the physical and transition risks of climate change. The process is applicable for equity and bond holdings, as the notion of risks to the companies is the same for both, though the materiality may be different. Our analysis relies on company disclosures as well as external data and analysis. The company-level risks are objectively scored and ranked by the ESG Score and ESG View.

See more on the ESG View and the ESG Score in the next section

Country-level risks, which are important for both sovereign bond investments and to assess investments’ exposures to countries with heightened risks, are identified through the country ESG score, which includes metrics including climate resilience and exposure to water scarcity.

See more on the country ESG score in the next section

The climate and ESG information we collect, described above, are stored centrally in LGIM’s central data repository. The data can then be incorporated into various internal reports, such as risk and portfolio monitoring, and external reports in summary/illustrative form, such as fund fact sheets and client reports.

Lastly, on the topic of identifying risks for investors, we believe it is critical that the research available to assess and act on climate becomes more readily available. To this end, LGIM has supported a number of new research and academic initiatives related to the low-carbon transition. We contributed to a report by the Carbon Tracker Initiative on the exposure of oil and gas companies’ upstream projects to the low-carbon transition. We are also one of the funding partners of the Transition Pathway Initiative, a tool for investors which assesses companies’ preparedness for the transition to a low-carbon economy.

34 http://2degreeseparation.com/
PROCESSSES FOR MANAGING CLIMATE-RELATED RISKS

Engagement – ESG for all clients and markets

Our engagements with companies help us identify which companies are best positioned to manage climate-related risks, and those that are falling behind. Climate change has been a consistent priority for us during our company engagements. During 2017 and 2018, it was one of our top three most-frequently discussed engagement topics.

LGIM’s Climate Impact Pledge is our flagship engagement programme aimed at addressing climate change and helping companies transition to a low-carbon economy.

Under our Climate Impact Pledge, we have committed to engage with the world’s largest companies in six sectors which are key to the low-carbon transition: oil and gas, mining, electric utilities, autos, food retail and financials. We engage on behalf of all our clients’ assets, across asset classes and investment strategies.

The companies targeted are scored on over 170 indicators, based on their articulation of risk and opportunities, the level of transparency, the robustness of their governance, the strength of their strategies in pursuing new opportunities, the record of controversial incidents and how they lobby governments on climate regulations. All companies are contacted directly to discuss areas of improvements with constructive feedback based on their current disclosures. The aim of the engagement is to help companies in key industries succeed in the transition to a low-carbon world, which in turn protects our clients’ assets from transition and physical risks. The leaders in each of the sectors are celebrated in our ‘name and fame’ programme to highlight how it is possible to create climate solutions in every industry.

At the same time, some of our requests come with a 12-month limit for tangible action to be demonstrated publicly, as they reflect what we consider to be a minimum threshold for companies of such significance. Failure to meet this timeline will lead to voting against the chair of the board across the entire equity holdings of LGIM and to divestment in our Future World fund range. To find our first result from the engagement, go to: www.lgim.com/fr/en/insights/our-thinking/market-insights/lgims-climate-impact-pledge-the-results-so-far.html

Our assessment criteria are fully compatible with the TCFD framework and we have added a new category of “TCFD disclosure” for the 2019 assessment.

Our engagements on climate change go beyond LGIM-led initiatives. We collaborate with other investors – through networks such as IIGCC and the PRI – and have been a part of the Climate Action 100+ initiative, which gathered over $32 trillion of assets under management to push collectively for climate action from investee companies and policymakers.
Long-term themes – sector views

LGIM’s thematic working groups undertake top-down research and analysis of macro-economic issues relating to the themes of technology, energy, demographics and politics. Climate change has been identified as a key trend which cuts across these themes and the working groups aim to understand the implications of climate risk on different asset classes and investment strategies.

To be able to comprehensively assess energy demand and supply assumptions which are pervasive in the market, LGIM has partnered with Baringa to produce a detailed, bespoke and proprietary global model of the energy transition out to 2050. The model named ‘DESTINATION’ offers unique insights into the inter-dependencies of the global energy system.

The model we are constructing will be a vital tool in sourcing and identifying the winners of the future. The ultimate objective for the energy system model is to understand what is required in order to meet the overarching targets surrounding greenhouse gas emissions in the medium to long term.

The energy transition presents the world with two challenges that are interrelated:

- How do we radically lower the emissions of our current energy system, in the cheapest, most efficient and least disruptive way?
- How do we meet the rapidly growing demand for energy in the developing world?

We believe investors have a crucial role to play. The energy transition is already consuming huge quantities of investors’ capital. And whether it is the billions of dollars of investment needed for renewables to finance energy infrastructure or meet the growing demand for energy investment in the emerging world, the call on our capital is only going to increase. This tool allows us to test and stress test our assumption and establish informed views; further strengthening our role as a provider of capital that carefully considers the energy needs in the context of building a sustainable future.

ESG Score – rising market standards

In index funds, our main focus is to protect our clients’ assets from the market-wide impacts of climate change, focusing on reducing exposure to transition risks and to ensure the overall financing model is not contributing negatively towards dangerous levels of global warming. Due to the large investable universe, data availability and reliability is a fundamental issue. For this reason, we focused on limited but important data points which provide insightful information about the companies’ exposure to climate risks and opportunities.

LGIM has an ESG Score for all main investable companies, comprising 28 individual indicators, of which three are directly linked to climate change. These three indicators constitute a third of the overall weighting of the ESG Score, reflecting the heightened level of risks to the market.
The three chosen indicators are carbon emissions (greenhouse gas emissions from scope 1 and 2) and carbon reserves (reserves of oil, gas and coal), as well as the percentage of the ‘green’ revenue contribution from low-carbon and environmental solutions, such as renewables and electric vehicles.

The ESG Score is used in creating new index funds, by reducing exposure to companies with above-average emissions or reserves and overweighting them for having green revenues. In constructing the index, the aim has been to reduce exposure to companies and industries at risk from the energy transition theme (subject to tracking error constraints). Simultaneously, the score aims to capture some of the opportunities associated with the growing ‘green’ economy.

The ESG Score is also used to define LGIM’s engagement programme. The link between asset allocation, direct engagement and voting actions means that companies receive consistent messages and are incentivised to improve their standards, which we believe has the potential to raise overall market standards.

**ESG View – active integration**

Bottom-up assessment of ESG risks, including climate change, is carried out day-to-day by the active fixed income and equity investment teams as part of their fundamental analysis. We have recently updated the internal scoring methodology used by our active teams, resulting in more detailed coverage of climate and environmental issues. The ESG View is an in-house tool which provides an indicative score capturing a company’s ESG risk exposure. The tool assesses over 4000 companies drawing from 400 ESG indicators, which are chosen based on financial materiality in each of 70 separate sectors. Companies are scored and compared against their direct peer group on a range of environmental metrics including carbon emissions intensity, stranded asset risks, the strength of environmental policies, water risks and green revenues. This helps flag to analysts the companies which are both particularly exposed to climate risks and those that could be well-positioned to benefit from opportunities. This quantitative outcome is combined with detailed and qualitative analysis which leads to more holistic investment decisions based on financial materiality. These views also assist the dialogue between our analysts and the investee companies on climate issues by easily highlighting areas where the performance or disclosure of companies needs to be improved.

**ESG Country Score – sovereign risks**

LGIM’s ESG Country Score serves a dual purpose. Firstly, they are used in the fundamental analysis of sovereign bonds. Secondly, for corporate bonds, they help build a complete picture of the overall risk; by expressing the risk relationship between the domicile country of the issuer of the bond and the ESG profile of the issuer.

Our ESG Country Score draws on over 200 data points dedicated to assessing the quality of more than 200 sovereigns across both developed and emerging markets, based on metrics ranging from climate change adoption, emissions and waste and natural hazards, through to debt and fiscal management, government stability and human rights. Our sovereign experts have selected the metrics we consider most pertinent to substantiate our ESG assessment and then re-weighted the outputs to generate an ESG country score ranging from 0-10 (0 being very weak, 10 being very strong). The output is also incorporated into the ESG View, described above, in assessing company level risks.

When assessing a country, our analysts focus on different variables depending on whether the sovereign is considered a developed market (DM) or an emerging market (EM). From a DM perspective, a sovereign’s score will be largely driven by macro-thematic conditions concerning monetary and fiscal policy, the domestic political situation or wider geopolitical risks, and climate change may have a limited impact on DM countries’ ability to pay back their debt. However, from an EM perspective, further consideration is given to more granular factors, including climate change impacts and access to resources. The development of these factors is an important indicator of growth potential.
CLIMATE SCENARIOS

We are developing several ways in which we can apply climate scenarios to our investment process meaningfully. The following demonstrates the categories under which we are exploring our options:

Scenario analysis at portfolio level – 2°C scenario

Our work on the energy transition described in the previous section includes stress-testing sectors against high carbon prices and changes in consensus assumptions regarding low-carbon technologies, from today to 2050. For example, the International Energy Agency’s 450 scenario, aligned with a 2°C pathway, assumes a carbon price of $100 by 2030 in OECD markets. As more of the world’s emissions are covered by rising carbon prices, this could prove disruptive for sectors such as energy. We have the flexibility to incorporate any carbon price into our energy modelling assumptions and will look to stress-test the implications of a carbon price ranging between $100-150. The result of this analysis will be discussed in our long-term thematic groups.

In the next section, we explain our rationale and the principle behind the Future World funds which aim to explicitly tackle the goal of aligning the benchmark index to the low-carbon transition. We do not, however, claim to fully understand what a 2°C-aligned portfolio could look like. We have explored various external data sources, such as the PACTA model, but have yet to see a convincing model that is based on solid analysis and data points. Following the latest developments in Europe – including regulation on the standardisation of ‘low-carbon benchmarks’, we expect work in this area to continue apace.

Real assets

We have committed to undertake modelling to identify which measures would be required for a property to achieve energy targets aligned with a 2°C scenario. Alignment will involve achieving a high energy efficiency performance by 2030, and carbon neutrality by 2050. As part of our modelling, we are assessing the cost of various measures and factoring them into the annual business plan for each asset to understand the financial implications of aligning our property portfolio.

Clean energy and low-carbon solutions

The key item on the low-carbon transition agenda is to establish how much new infrastructure needs to be built, rather than solely focussing on reducing dependencies on fossil fuel-based systems. The role of institutional investors will become even more vital in helping to channel capital towards new types of low-carbon solutions and clean energy technologies. Access to better information – through better disclosure by companies or initiatives like the sustainable taxonomy proposed by the EU – will contribute to making capital allocation more efficient.

But it may not, in itself, trigger a large-scale change. Many large institutional investors have a preference (in many cases, due to regulatory requirements) for listed investments, often in developed markets. Yet some of the low-carbon opportunities currently lie outside the listed space in less liquid asset classes (e.g. infrastructure) and in emerging markets. It will be necessary to incentivise institutional investors to invest in these opportunities and to remove regulatory barriers - e.g. daily or weekly liquidity constraints. We will continue to engage with regulators on tackling such obstacles in order to create new opportunities for low-carbon investments.

35 China is rolling out the world’s largest emissions trading mechanism. Carbon prices in the EU, the current largest carbon market have also risen dramatically in recent years.
36 https://2degrees-investing.org/pacta/
Metrics and targets

Disclose the metrics used by the organisation to assess climate-related risks and opportunities in line with its strategy and risk management process

Climate change risk, with its multitude of impacts, is inherently difficult to measure. This challenge is exacerbated by the complex ways in which it affects the different types of assets we manage on behalf of our clients. The lack of granular, comprehensive and comparable data is the very reason we need TCFD-aligned reporting. We expect the quality of disclosure by companies to improve over time due to the TCFD and its enhancements over time, as well as other type of ESG requirements being adopted globally.

Carbon emissions – Scope 1 and 2

As the most significant driver of global warming, data on emissions of carbon dioxide (or greenhouse gases standardised as CO₂ equivalent)\(^37\) is most readily available. Scope 1 and 2 emissions are the most easily measured and tracked across the investment universe. Our discussion of the carbon footprint of our own investments will focus on Scope 1 and 2 emissions.

Carbon emissions – Scope 3

Disclosure on Scope 3 emissions is vitally important to understand the indirect risks companies may be exposed to, but the quality of the disclosure on a global and cross-sectoral level is extremely poor. As such, we deem it too unreliable and misleading to footprint an entire portfolio for Scope 3 at this point. We do, however, use Scope 3 information for our investment and engagement analyses.

Throughout this report, the classification of emissions into ‘scopes’ follows the guidelines from the GHG Protocol.

Carbon reserves

While carbon emissions capture the current status of companies’ operations and energy use, addressing climate change requires the consideration of future emissions embedded in known reserves and resources of fossil fuels, i.e. coal, gas and oil. These exposures are captured under our metric of ‘embedded carbon’ – i.e. the resulting emissions if the reserves were to be dug out and burned in the future. Naturally, only a limited subset of the investment universe, mostly in the energy, utilities and materials sectors, is affected by this footprint.

Green revenues

It is extremely difficult to capture the opportunity set from the low-carbon transition by identifying with certainty the future ‘winners’. Most large companies will devote some section of their public-facing materials to tout their commitment to sustainability. Yet it is difficult to capture this at a data level, particularly when such materials are based on aspirational targets.

Against this, we have sought the methodology of ‘green revenue’. It is the percentage of revenue that companies disclose in the public domain which can be plausibly linked to low-carbon and environmental solutions, such as renewables, electric vehicles and efficiency tools. The current

\(^{37}\) Carbon dioxide equivalent (CO₂e, a standardised unit for different greenhouse gases including methane)
number of companies disclosing this information is limited, but we believe it will increase over time as the demand to positively tilt investment exposure to the opportunity set increases.

Physical risks

Physical risks are captured at country level on metrics such as the adoption of climate change policies, economic and population exposure to natural hazards, exposure to water and heat stress, as well as overall country data on GHG emissions, waste management, air quality, biodiversity and deforestation. These data points contribute towards building the Country ESG Score. More granular level details are collected and analysed for direct investments in property or infrastructure, which is part of the due diligence to assess the future risks such as storms and floods.

Qualitative assessment

For individual company-level risks, we pull together extra company information on environmental/climate change policies, water use, gas flaring and waste management, etc. All these components are scored in order to allow for inter-company comparison and used in our active investment process.

As mentioned above in the Strategy section, we are also developing a global energy model, in conjunction with an external energy consultancy. The ambition is that this will allow our investment teams to analyse the impact to a given sector from different levels of carbon pricing, in addition to a range of other key drivers of the energy transition.

Additionally for the Climate Impact Pledge, for which we focus on largest companies in key sectors, we combine independent data providers and our expertise, with our methodology drawing on over 170 indicators, all linked to climate resilience. Details of the data sources are outlined in this document - http://www.lgim.com/library/knowledge/thought-leadership-content/esg-spotlight/ESG_Spotlight-FWF.pdf?hootPostID=955f36caf420b4e6f04dad178327ff86

The table below illustrates the significant alignment between the TCFD and our chosen metrics.

| Table 7 TCFD recommendations vs. Climate Impact Pledge scoring categories |
|-----------------------------|-----------------------------|
| TCFD: Disclose climate-related risks and opportunities as they relate to… | LGIM Climate Impact Pledge criteria |
| Governance                  | 24 governance-related criteria, including: |
|                             | - the board support for climate action |
|                             | - discussion of climate opportunities in MD&A section of annual report |
| Strategy                    | 6 strategy criteria, including: |
|                             | - the use of scenario analysis |
|                             | - the identification of climate risks |
|                             | - the identification of climate opportunities |
| Risk Management             | 7 risk metrics, including: |
|                             | - exposure to regulatory risk |
|                             | - exposure to physical risk. |
| Metrics and Targets         | - GHG scope 1, 2, 3 emissions reported |
|                             | - Environmental management systems |
|                             | - Adopted emissions reductions targets |
|                             | - Link between business model and GHG intensity |
In addition to TCFD guidelines, we also assess companies specifically on their climate lobbying activities, reputational risks and general governance robustness (such as board independence or frequency of shareholder votes against management). This broadens the TCFD focus on disclosures, while remaining entirely consistent with the TCFD’s ultimate goal to assess and improve company resilience in a low-carbon world.

Real Assets

Our real estate investments are assessed on a wide range of environmental metrics, examples of which include: BREEAM and Energy Performance Certificate (EPC) ratings, water usage, waste management, flood risks, design and thermal performance of building materials, energy and gas usage metering.

DISCLOSE SCOPE 1, SCOPE 2, AND, IF APPROPRIATE, SCOPE 3 GREENHOUSE GAS (GHG) EMISSIONS, AND THE RELATED RISKS

As we manage over £1 trillion of assets for millions of clients in hundreds of separate funds, it is unfeasible and fruitless to show carbon intensity separately for each fund. At the same time, a large proportion of the funds we manage are index funds or active funds that are benchmarked against the same indices. We have therefore provided indicative carbon intensity for what we believe are some of the most representative listed equity and bond indices in the market, as well a discussion of the carbon intensity of certain sovereign debt portfolios.

We then look beyond our investments, at emissions associated with our operations and our real assets portfolio.

In our discussion of climate metrics, we have used data that is most broadly applicable across asset classes and our investment universe.

Carbon emissions associated with investments – Scope 1 and 2

There are different ways to understand emissions in relation to the amount of investment or in relationship to the revenues generated by companies:

1) Carbon emissions in relation to the amount of investment (carbon footprint)

This aims to answer the question: how much carbon do I own?

A client might use it to understand the overall exposure per unit of investment.

2) Carbon emissions in relation to the revenues generated by companies (carbon intensity).

This aims to answer the question: how ‘carbon efficient’ are the companies I invest in?

A client might use the metric to compare different companies – the emissions of large companies become comparable to those of smaller companies in the same industry by dividing them by their respective revenues.

Equities

We have displayed the carbon footprint (per unit of investment) and carbon intensity (per revenue generated by companies) for three representative indices:

FTSE All-Share Index, covering 98% of the UK’s market capitalisation

FTSE Developed Index – ‘a market-capitalization weighted index representing the performance of large and mid cap companies in Developed markets’

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38 As at 28 February 2019. Source: FTSE Russell.
39 Source FTSE Russell
FTSE Emerging Index – ‘large and mid cap securities from advanced and secondary emerging markets’

Approximately £278 billion of LGIM’s assets under management are invested in funds which are exposed to stocks within these broad benchmarks, as at 21/11/2018. The regional split of passive funds between the three exposures at that date is roughly £58bn, £200bn and £20bn respectively. Please note we manage a number of other indices, but the carbon footprint in such regional equity indices, which are based on market capitalisation, is considered comparable.

Source: LGIM using Trucost data, as at 21/11/2018. Carbon footprint and carbon intensity are depicted on the left-hand axis, while the data coverage is on the right-hand axis.

On both carbon metrics used, we note that developed markets perform better than emerging markets – this is the result of a number of factors, including the technological capabilities of companies and the stringency of regulation. For example, countries in emerging markets are more reliant on coal – the most carbon-intensive fossil fuel – and might often have less efficient manufacturing processes.

However, it is also the case that many global multinational companies outsource a significant part of their production to emerging markets. As such, a proportion of the associated emissions that originate in emerging markets may nonetheless have developed markets as their ultimate cause. When data on Scope 3 emissions becomes available, and inclusive of both upstream and downstream effects, we expect the full impact of developed markets can be demonstrated.

This should not lead necessarily to the conclusion that carbon investment risks are sitting more in emerging countries. Developed markets like Europe are more likely to impose stricter carbon prices and limit operational emissions; hence companies operating there might be more at risk of the bottom-line being eroded for inefficient operations.

The second notable feature of the chart above is that the emissions associated with the UK market (FTSE All-Share) are similar to those in developed markets more broadly. This is in part due to the fact that many of world’s most carbon-intensive companies (particularly some of the largest oil, gas and mining companies) are listed on the London Stock Exchange and will therefore be represented in the UK index.
Breaking down the charts further, the below chart illustrates the contribution to the overall carbon emissions in each regional index from major sectors:

Source: LGIM using Trucost data, as at 21/11/2018

In line with our suggestion above, the energy sector (which includes oil and gas producers) and the materials sector (which includes mining) is a significant contributor to the overall footprint of the All-Share index.

Going beyond the emissions of today to those of the future, we analyse potential emissions from fossil fuel reserves. The same indices are broken down by the types of carbon reserves (coal, oil and gas). The following chart shows the embedded carbon in the reserves owned by the underlying companies, grouped by different fossil fuels.
The chart illustrates future emissions by dividing the amount of carbon embedded in the reserves owned by the companies in these indices by their respective market capitalisation. As such, companies with large reserves but small market capitalisation will be particularly highlighted in this analysis, hence the result of emerging markets standing out (the total market capitalisation of oil and gas companies in FTSE Emerging Index is less than a third of the same sector’s market capitalisation in the FTSE Developed).

It reinforces the high exposure to coal in the FTSE All-Share, due to many mining companies listing on the London Stock Exchange. The exposure is comparable with that of the FTSE Emerging Index.

We also carried out an analysis to show that exposure to such reserves is very concentrated. For all three indices, fewer than 10 stocks contribute more than half of the total carbon reserves. Therefore, the investment solutions and engagement programme can be concentrated to the target companies.

Corporate bonds

We present a similar analysis for three representative indices of corporate bonds denominated in:

- Sterling (iBoxx Sterling Non-Gilts ex-BBB)
- Euros (Lehman’s Global Agg EUR Corp 5+ Ex BBB)
- US Dollars (Lehman’s Global Agg USD Corp 5+ Ex BBB).

Unlike equities, bond indices are more varied as they are built to target a specific duration and risk appetite. We have chosen three indices, with combined passive assets of approximately £9.3bn for this analysis (as at 21/11/2018), but please note that we manage many other indices with very similar constituents (such as iBoxx £ Non-Gilts ex-BBB 15+ for sterling) with similar asset sizes. Additionally, many of the assets in our active credit funds are benchmarked against the same or similar indices.

Source: FTSE Russell, as at 28 February 2019
Overall, the carbon footprint of the three bond indices is broadly similar, though the level of data coverage varies in our database. We note the low coverage for the sterling index (40%). This is due to a much higher allocation to supranational issuers compared to the other two indices, and may skew the results for the sterling index, insofar as companies disclosing any carbon data make an outsized contribution to the result compared to companies for which there is no data in our database.
The contribution to carbon emission by sector is as follows:

**Chart 9 Contribution to Carbon Emissions**

Source: LGIM using Trucost data, as at 21/11/2018

The sector breakdown charts above show that utilities are a large constituent of bond indices and therefore by far the most significant contributors to carbon exposure. Sterling-denominated debt has higher carbon emissions, per million invested, than US dollar or euro-denominated debt, due to a higher proportion allocated to the utility sector. However, this does not necessarily mean that UK utilities have much higher emissions than their European or US counterparts as the results are affected by how much outstanding debt a particular company has issued (the more leverage a company has, the more bonds are issued and therefore the company is likely to constitute a larger proportion of the index) as well as by the previously mentioned data coverage issue.

**Government bonds**

Best practice with regards to measuring the emissions intensity of sovereign debt is still developing. With regards to equity and corporate bonds, investors can be attributed a part of the company's total emissions, as they are either directly funding its activities, or own a percentage of the company. The logic behind sovereign debt is not quite as straightforward, as it is not clear that an investor actually has "ownership" of the emissions generated in a particular country.

We have attempted a similar calculation to those above in order to assess the carbon emissions of our total investments in UK government bonds (gilts) and US Treasuries (£153.1bn and £16.3bn respectively as at 30 June 2018), as they are by far the biggest exposure to sovereign bonds of our clients.
1) Total associated carbon emissions

LGIM’s holdings as a percentage of the country’s total outstanding debt are multiplied by the country’s total emissions. This measure indicates the absolute share of total country carbon emissions, which can be associated with the proportion of a country’s outstanding debt held by LGIM.


The chart above reflects the fact that LGIM owns a higher proportion of UK government debt (compared to the government’s total outstanding debt) than it does US government debt. Therefore, a higher proportion of the UK’s emissions can be linked to our gilt holdings. As the next chart will show, the chart above should not be interpreted as suggesting that the UK economy has a higher carbon ‘content’.

2) Carbon emissions intensity

A country’s total emissions are divided by its GDP. This indicates the emissions intensity of the overall country’s economy, rather than the emissions intensity of LGIM’s investments.

Considered in terms of carbon ‘efficiency’ – amount of emissions per unit of GDP – the UK economy scores better than the US.

This analysis can also be used to illustrate the on-going decoupling of emissions from economic growth, as the GDP of both countries has grown at similar rates over the past decades, but the resulting carbon emission profiles are quite different. The next section will provide more detail of the differences between the UK and US, not at the aggregate economy level, but at a company level.

**Historical trends and decarbonisation scenarios**

To demonstrate the historical trends, we have analysed the evolution of the carbon emissions of companies in our carbon database. We have looked at how the carbon emissions intensity of the median company in our database has changed over time (using Scope 1 and 2 emissions divided by million dollar of revenue). As the mid-point between the most and the least intensive companies, the chart below provides a good indication of the decarbonisation path for the companies and the regions they represent by proxy. We have looked at the emissions intensity of the median US company, the median UK company and the median of global companies.

![Chart 12 Median carbon emissions intensity (tCO₂/$mn of revenue)](chart)

Source: Trucost. Carbon data covers Scope 1+2 emissions for companies in our database

The results show that there was a general trend to decarbonise, but the trajectory has been reversed since 2016, with a heightened spike in the case of US companies.

Through our engagement and policy advocacy, we are encouraging companies and regulators globally to take steps to decarbonise the world economy. But for the vast majority of index funds, we have no choice but to invest in all constituent companies (which are primarily determined on the basis of market capitalisation).

The speed at which global markets have been decarbonising (or, rather, have not done so, as the chart above shows) presents cause for concern, given that the scientific community has consistently stressed the urgency of faster decarbonisation.

The IPCC special report on 1.5°C of global warming provides several illustrative pathways as shown below:

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41 Source: World Bank
While the precise trajectory of emissions will vary according to different technology combinations, the chart shows very clearly that meeting the 1.5°C target requires a rapid peak and subsequent decline in global emissions, reaching net zero in the next few decades.

**Carbon reserves**

Meeting this target will also require a rapid reduction in the unabated use of fossil fuels. Research suggests that the total amount of carbon embedded in fossil fuel reserves and resources far exceeds the amount that can be burnt if the world is to meet the goal of the Paris Agreement. As the International Energy Agency put it, no more “than one-third of proven reserves of fossil fuels can be consumed prior to 2050 if the world is to achieve the 2 °C goal, unless carbon capture and storage (CCS) technology is widely deployed.” However, we note that CCS is currently, and in the foreseeable future, too expensive to deploy at scale and is not a reliable or reasonable hedge against this decarbonisation target.

This raises the possibility that a significant proportion of the other 66% of reserves could be left ‘stranded’ by economic or regulatory factors. We note that this percentage of would be even higher for the more stringent 1.5°C target which implies lower carbon emissions in the atmosphere.

**Green revenues**

Meeting the target of the Paris Agreement will also require a significant upscaling of investment in areas such as low-carbon energy, infrastructure and efficiency. One estimate suggests up to $90 trillion in infrastructure investment cumulatively by 2030 will be needed to put the world on a low-carbon trajectory. Moving the global economy from ‘brown’ to ‘green’ presents significant investment opportunities, which companies are increasingly taking advantage of. However, from a data perspective, the number of companies disclosing ‘green revenues’ as a separate item in their annual accounts is relatively low. The table below illustrates the number of companies in our green revenues database, grouped by region and sector of activity.

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<table>
<thead>
<tr>
<th>Category</th>
<th>Asia Pacific</th>
<th>Europe</th>
<th>Latin America</th>
<th>Middle East &amp; Africa</th>
<th>North America</th>
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</thead>
<tbody>
<tr>
<td>Agriculture</td>
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<td>3</td>
<td></td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>Bio-Energy</td>
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<td>6</td>
<td>4</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Buildings Efficiency</td>
<td>21</td>
<td>13</td>
<td>4</td>
<td></td>
<td>11</td>
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<tr>
<td>Carbon Capture and Storage</td>
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<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Diversified Renewables</td>
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<td>8</td>
<td>2</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Energy Storage</td>
<td>6</td>
<td>1</td>
<td>1</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Forestry</td>
<td></td>
<td>2</td>
<td>1</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Fuel Cells</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Geothermal</td>
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<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydro</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Industrial Efficiency</td>
<td>6</td>
<td>11</td>
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<td></td>
<td>11</td>
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<td>Integrated Power</td>
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<td>9</td>
<td></td>
<td>19</td>
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<td>Investment Companies</td>
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<td></td>
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<tr>
<td>Pollution Control</td>
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<td>3</td>
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<tr>
<td>Rare Metals</td>
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<td></td>
<td></td>
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<tr>
<td>Solar</td>
<td>21</td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Transport Efficiency</td>
<td>36</td>
<td>14</td>
<td></td>
<td></td>
<td>14</td>
</tr>
<tr>
<td>Waste</td>
<td>6</td>
<td>1</td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Water</td>
<td>36</td>
<td>21</td>
<td>2</td>
<td></td>
<td>14</td>
</tr>
<tr>
<td>Wind</td>
<td>11</td>
<td>7</td>
<td>1</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td><strong>208</strong></td>
<td><strong>101</strong></td>
<td><strong>22</strong></td>
<td><strong>5</strong></td>
<td><strong>101</strong></td>
</tr>
</tbody>
</table>

Source: HSBC, database of global companies generating green revenues, capturing 2016/2017 calendar year

The table shows the diversity of avenues through which green revenues can be generated. And, as mentioned above, it also shows the relative dearth of companies with carbon capture and storage operations. 43

See more at: https://futureworldblog.lgim.com/categories/themes/catch-c-if-you-can/
Low-carbon funds

An increasing number of our clients wish to take a stronger stance on climate change through their investments, by reducing their exposure to carbon-intensive companies and/or increasing their exposure to companies providing low-carbon solutions. To meet and accelerate this demand, LGIM has developed funds in the Future World range, incorporating data on carbon emissions, carbon reserves and green revenues to devise alternatively-weighted indices and funds.

Compared to a traditional index based on market capitalisation, the weights of carbon-intensive companies are reduced, while the weights of companies generating green revenues are increased. The table below shows the difference in exposure to climate metrics between a ‘tilted’ global equity index tracked by a fund in the Future World range, and the unadjusted benchmark.

<table>
<thead>
<tr>
<th>Metric</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fossil fuel reserve reduction (tCO₂e/ £mn revenue)</td>
<td>- 61%</td>
</tr>
<tr>
<td>Carbon emissions reduction (tCO₂e/ £mn market cap)</td>
<td>- 27%</td>
</tr>
<tr>
<td>Green revenue increase (As proportion of total revenue %)</td>
<td>+ 68%</td>
</tr>
</tbody>
</table>

FTSE All-World ex-CW Climate Balanced Factor Index vs. FTSE All-World Index, compared to its benchmark.
Source: FTSE Russell, data as at 31/01/19.

The key question we receive from our clients is “what is the impact on performance from a climate tilt?” As such we have presented below back-tested data for a carbon-tilted index against the mainstream benchmark index since 2011:

Notably, the returns are very similar to the benchmark. Therefore, an index intended to capture the energy transition and hedge against the climate risks has proven to provide robust risk-adjusted returns.

Emissions associated with operations and our Real Assets portfolio

The charts below show Scope 1 and 2 greenhouse gas emissions, waste and water use for LGIM’s operations over the past three years. Our electricity is procured from a renewable tariff, and over the past three years the emissions associated with our energy use (Scope 2 emissions) have decreased by 31%.
The chart below shows Scope 1 and 2 greenhouse gas emissions associated with our Real Assets portfolio. Over the past three years, we have decreased our Scope 2 emissions by 18% while the Scope 1 emissions have stayed relatively steady.

Within our Real Assets team, we have already reduced our carbon emissions by 22%, compared to a 2010 baseline. Each asset has been reviewed to improve energy performance and the percentage of properties with Energy Performance Certificates of F and G has been reduced from 14% in 2014 to less than 4% in 2018.
Just as we encourage the companies we invest in to take action on climate change, it is important for LGIM to manage its own environmental footprint. This is true both of LGIM and of our parent company. Detailed carbon and environmental data for the entire Legal & General Group is available on our website.

The Science Based Target Initiative (SBTi) will be releasing its recommendations on decarbonisation targets for the financial sector in January 2020. In the meantime, we are developing our TCFD reporting capabilities by carbon footprinting our assets and office buildings, in order to better understand the challenges facing also our own operations. We have worked with sustainability consultancy Carbon Clear to measure the Scope 1 and 2 emissions (tCO2e/m2) of our occupied buildings, and to assess how much these emissions would need to fall by 2030 and 2050 in order to align with a below-2°C pathway, applying the Sectoral Decarbonisation Approach. From this preliminary analysis, it is clear that the emissions reduction required over the next few decades is significant. Therefore, we are developing capabilities internally, ensuring that when the SBTi recommendations are released, we are able to set feasible verifiable targets.

TARGETS USED BY THE ORGANIZATION TO MANAGE CLIMATE-RELATED RISKS AND OPPORTUNITIES AND PERFORMANCE AGAINST TARGETS

Our target overall is to create a positive impact globally by incentivising companies to embrace the risks of climate change and provide low-carbon solutions. This, in turn, protects the market and hence our clients’ investments. This requires a whole system change from individual investment choices through to companies’ leadership and government regulations.

While we intend to play an active role in driving this agenda, we are cognisant that our direct contribution is often difficult to measure. Therefore, we have put in place targets and ambitions in areas where we feel it is our responsibility to be accountable. But we must also be sensitive to the reality that not everything can be quantified and measured. The culture we build as an asset manager to embrace this challenge and be the provider of a positive solution is at the core of our ambition.

The targets are broadly set in the following areas:

**Engagement with companies**

Our Climate Impact Pledge is our promise to engage with the largest companies in key sectors which need to address climate change. It is a firm-wide commitment that has implications for all our clients. The scores and ratings that we allocate to improvements made by target companies mean that our progress and changes can be monitored and communicated on an ongoing basis. We raise the minimum standards set every year, to ratchet up the pressure.

We have consistently included the topic of climate change in the annual seminars we host for non-executive directors of companies. To help reach a wider audience, we will publish a guideline for company boards on how climate should be governed.

**Carbon tools and education for clients**

We are in the process of building carbon footprinting tools and incorporating carbon data in certain fund factsheets. We would like to use this as a basis, with our clients, to have an elevated conversation about the risks and opportunities that may be sitting in their portfolios, in order to then discuss options to address them.

Clearly, for some clients, the basics of climate risk need to be understood more generally first. We have incorporated the topic of climate change in client/trustee education programmes and
seminars, including our flagship client conferences. We intend to enhance this programme as regulatory pressures to address climate issues increase.

Investment solutions

Providing investment options that address climate risks and explore low-carbon opportunities is the cornerstone of our contribution to this challenge. The Future World fund range aims to provide mainstream investment solutions. We have allocated significant resources internally to ensure the solutions we design apply to our different client sets globally. As a business, we have great ambitions for an investment solution that tackles both the financial outcomes and the challenges of climate change. In order for the market to shift meaningfully and for the risks to be appropriately priced in, we believe mainstream fund solutions need to start incorporating climate implications en masse. We are geared up to provide such options by engaging closely with our clients and being sensitive to their specific requirements. A good measure of success is the amount of assets which incorporate climate issues within LGIM and the industry as a whole.

Property

For our property investments, we have set a target to reduce the carbon emissions associated with our real estate portfolio by 20% between 2010 and 2020. A science-based reduction target is currently being developed, to align emissions of our real estate assets with the 2°C pathway, the result of which will be further be incorporated in to the target-setting process.

Our parent company, Legal & General, has also adopted targets as part of their strategic commitment to support the transition to a low-carbon economy. More details are available here: https://www.legalandgeneralgroup.com/csr/our-focus-areas/transitioning-to-a-low-carbon-economy/
Conclusion

LGIM recognises and takes climate-related risks and opportunities seriously by embedding them into every part of the investment offering as showcased by this TCFD-aligned disclosure. Acknowledging climate change as a financially material issue and reporting on it is a crucial component in helping to move the global financial system in a direction compatible with a well-below-2°C pathway.

Clients of LGIM benefit from the ways in which we push global companies to embrace the challenge of climate change and to succeed in a low-carbon economy. Our integrated investment process incorporates climate considerations from both quantitative and qualitative perspectives, while the engagement programme – the Climate Impact Pledge – aims to push key companies to step up and speed up.

However, we recognise that no single investor, not even one of our scale, can do this alone. We need our clients to understand the role they play, other investors to send consistent messages to companies, and regulators and policy-makers to create the right conditions to set the global economy on a low-carbon trajectory. This can help create a virtuous circle where the financial sector demands higher standards in order to allocate capital to companies and more companies to raise their standards in order to receive that capital.

At LGIM, we have made a strong commitment to drive this agenda across different parts of the vast and interconnected investment ecosystem and we hope this report demonstrates it. Our responsibility is to provide our clients with investment solutions that meet their financial needs; incorporating material climate risks and opportunities is consistent with this goal.

In doing so, we are working to protect our clients’ returns and help create a world we want to live in.
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