



TCFD

TASK FORCE ON
CLIMATE-RELATED
FINANCIAL
DISCLOSURES

Climate disclosures for year ending 31 March 2023

Produced by: The Group Trustees of the Northern Powergrid Group of the ESPS

Date: September 2023

Introduction

Climate change is affecting the planet, causing extreme weather events, impacting crop production, and threatening Earth's ecosystems. Understanding the impact of climate change and the Group's exposure to climate-related risks will help us to mitigate the risks and take advantage of any opportunities.

The Taskforce on Climate-related Financial Disclosure ("TCFD") is an initiative that developed some best practice guidance for climate-risk reporting. New UK regulations require pension scheme trustees to meet climate governance requirements and publish an annual TCFD-aligned report on their scheme's climate-related risks.

Better climate reporting should lead to better-informed decision-making on climate-related risks. Furthermore, greater transparency around climate-related risks should lead to more accountability and provide decision-useful information to investors and beneficiaries.

This document is the first annual TCFD-aligned report for the Northern Powergrid Group of the Electricity Supply Pension Scheme (the "Group"). It has been prepared by the Group Trustees for the year ended 31 March 2023.

This statement has been prepared in accordance with the regulations set out under "The Occupational Pension Schemes (Climate Change Governance and Reporting) Regulations 2021" (the "Regulations") and provides a status update on how the Group is currently aligning with each of the four elements set out in the regulations (and in line with the recommendations of the TCFD).

What is TCFD?

The Financial Stability Board created the Taskforce on Climate-related Financial Disclosure ("TCFD") to develop recommendations on the types of information that entities should disclose to support investors, lenders, and insurance underwriters in appropriately assessing and pricing risks related to climate change.

The TCFD has developed a framework to help public companies and other organisations, including pension schemes, more effectively disclose climate-related risks and opportunities through their existing reporting processes.



Table of contents

Introduction	2
Executive summary	4
Governance	5
Strategy	10
Risk management	19
Metrics & Targets	23
Appendices	29
Glossary	30
Appendix – climate-related risk assessment	32
Appendix – climate-related opportunities	39
Appendix – climate scenario modelling assumptions	41
Appendix – GHG emissions in more detail	42

Executive summary

Climate mission statement

The Group Trustees believe that the risks associated with climate change could have a significant, negative impact on the Group's investment returns. Therefore, the Group Trustees consider climate change risk when making investment decisions. Where possible, the Group Trustees will also seek to capture climate-related investment opportunities.

Strategy

The Group Trustees have carried out a qualitative risk assessment on each asset class in which the Group is invested. From this, the Group Trustees have identified which climate-related risks and opportunities could have a material impact on the Group, and over which timescales these risks and opportunities may arise. Given the number of strategies making up the Group's investment portfolio, the Group Trustees have completed a best endeavours exercise to analyse the climate-related risks of each asset class.

The Group Trustees have also undertaken quantitative climate change scenario analysis to better understand the impact climate change could have on the Group's investment and funding strategy over the time horizons identified as being most relevant to the Group.

The Group's investment portfolio exhibits reasonable resilience under most of the climate scenarios. This is due to the diversification of assets, low risk investment strategy and allocation to equities, and high levels of hedging against changes in interest rates and inflation.

Risk management

The Group Trustees have established a process to identify, assess and manage the climate-related risks that are relevant to the Group. This is part of the Group's wider risk management framework and is how the Group Trustees monitor the most significant risks to the Group, in their efforts to achieve appropriate outcomes for stakeholders.

Metrics and Targets

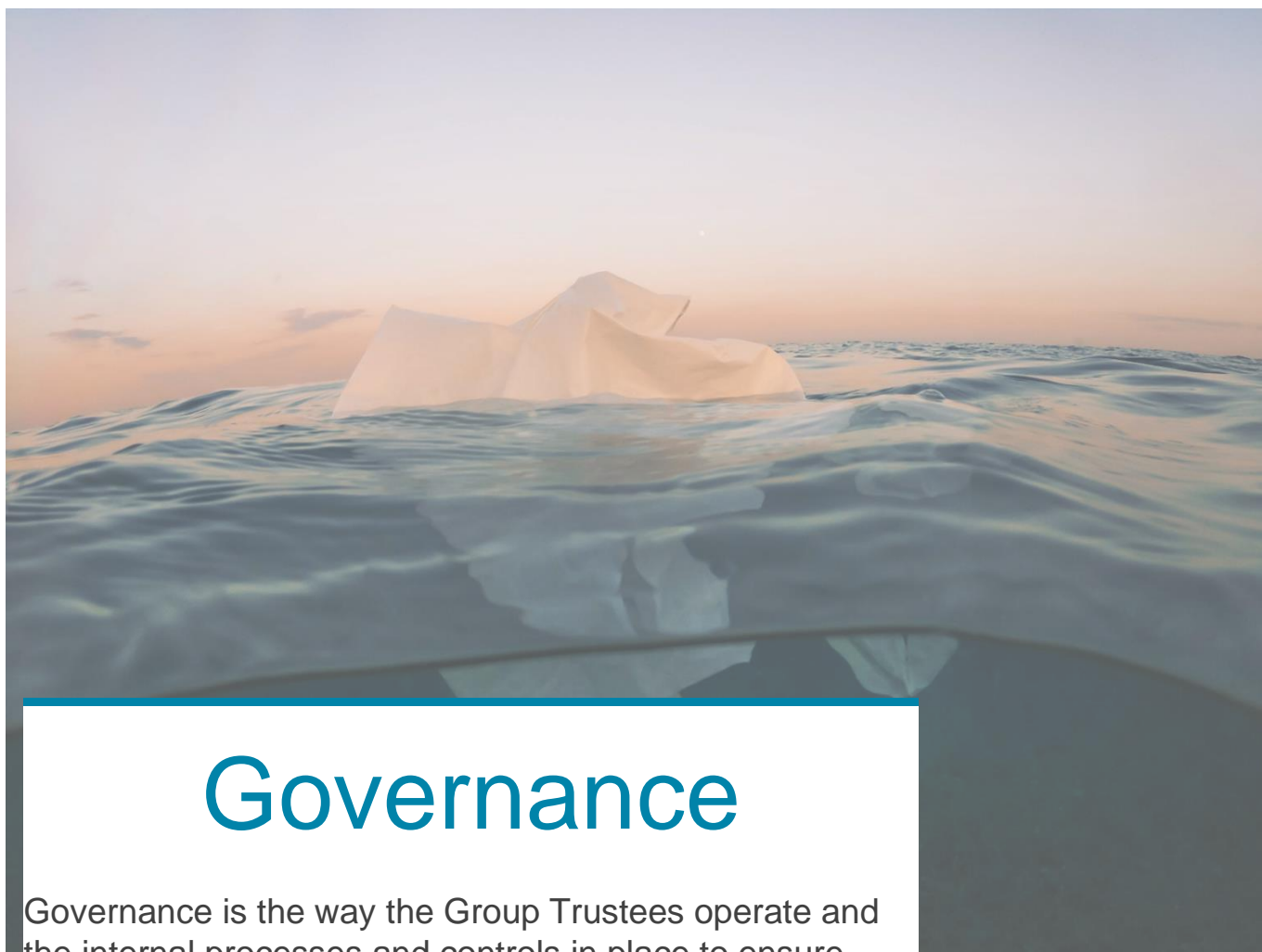
The Group Trustees have agreed to report on Total Greenhouse Gas (GHG) Emissions, Carbon Footprint, Binary Target measurements and Data Quality, and will report on these annually. The Group Trustees have also set a target to achieve above 90% coverage of carbon emission data across all asset classes by 5 years' time. The Group Trustees have also set the targets of increasing data availability and facilitating consistent reporting. The Group Trustees will assess the appropriateness of this target annually.

We hope you find this report informative and that it aids your understanding of how we are managing climate-related risks and opportunities within the Group.

Chairman

on behalf of the Trustees of the Northern Powergrid Group of the Electricity Supply Pension Scheme





Governance

Governance is the way the Group Trustees operate and the internal processes and controls in place to ensure appropriate oversight. Those undertaking governance activities are responsible for managing climate-related risks and opportunities.



The Group's climate-related governance arrangements

Climate mission statement

The Group Trustees recognise that climate change poses material financial risks, which could negatively impact the Group's investments and the ability to achieve its objectives. In their proportionate approach to managing these risks, they aim to protect the interests of the Group's members and beneficiaries, whilst also recognising that, as a large institutional investor, the Group can help to improve the long-term future of the global environment through scrutiny in its investment decisions.

Through the actions of its appointed investment managers and advisers, an engagement-led approach allows the Group to be an active participant in improving corporate behaviour, upholding high standards of corporate governance, and encouraging responsible ownership practices.

The Group Trustees also believe that the risks associated with climate change could negatively impact on the Group's investment returns within the timeframes that concern the Group Trustees. Because of these risks, the Group Trustees seek to integrate assessments of climate change risk into their investment risk management and strategy where possible.

Furthermore, the Group Trustees believe that climate-related factors are likely to create investment opportunities. Where possible, and where appropriately aligned with the Group Trustees' strategic objectives and fiduciary duty, the Group Trustees will seek to capture such opportunities through the Group's investment portfolio.

Our climate beliefs

We believe that the risks associated with climate change can have a materially detrimental impact on the Group's investment returns and, as such, we have a role to play in helping to tackle climate change.

We believe that climate-related factors may create investment opportunities. We will seek to capture these opportunities through our investment choices where they are appropriately aligned with our strategic objectives and fiduciary duties.

Role of the Group Trustees

The Group Trustees are ultimately collectively responsible for oversight of all strategic matters related to the Group. This includes approval of the governance and management framework relating to environmental, social and governance ("ESG") considerations and climate-related risks and opportunities. This is a longstanding area of focus for the Group Trustees, and an annual training programme was established to continually upgrade our knowledge and understanding in this important area.

Given its importance, the Group Trustees retained collective responsibility for setting the Group's climate change risk framework.

The Group Trustees have discussed and agreed their responsible investment (including climate-related) beliefs and overarching approach to managing environmental, social and governance (including climate change) risk. Details are set out in the Responsible Investment Policy and Statement of Investment Principles ("SIP"), which are reviewed and (re)approved annually (or sooner in the event of a significant change in investment policy).

The Group Trustees believe the most appropriate investment time horizons for the Group are as follows:

- **short term:** up to 3 years
- **medium term:** up to 10 years
- **long term:** 11 – 20 years (however, the Group Trustees recognise that the Group could be subject to longer term risks if the Group's liabilities are not secured within that time-period)

Both transition and physical risks climate-related risks and opportunities are assessed over the above time horizons, which will be re-evaluated each year in light of the Group's overall funding and strategic position.

The Group Trustees receive training annually (or more frequently as required) on climate-related issues as part of their TCFD reporting process, to ensure that they have an appropriate degree of knowledge and understanding to support good decision-making. This training is delivered primarily by a specialist member of the Group's dedicated investment consulting team but may also be delivered by other parties including the Group's appointed investment managers. The Group Trustees expect their advisers to bring important and relevant climate-related issues and developments to the Group Trustees' attention in a timely manner.

The Group Trustees have delegated implementation and day-to-day oversight of the Group's climate change risk management framework to the Funding & Investment Committee ("the F&IC"), which is a subcommittee of the Group Trustees. The Group Trustees regularly monitor and review progress against the Group's climate change risk management approach.



Role of the Funding and Investment Committee

The F&IC seeks to ensure that investment decisions appropriately consider climate-related risks and opportunities within the context of the Group's wider risk and return requirements and are consistent with the climate change policy as set out in the Statement of Investment Principles (the "SIP").

The F&IC regularly monitors and reviews progress against the Group's climate change risk management objectives. The F&IC keeps the Group Trustees apprised of any material climate-related developments.

Implementation is detailed later in this report, but key activities delegated to the F&IC include:

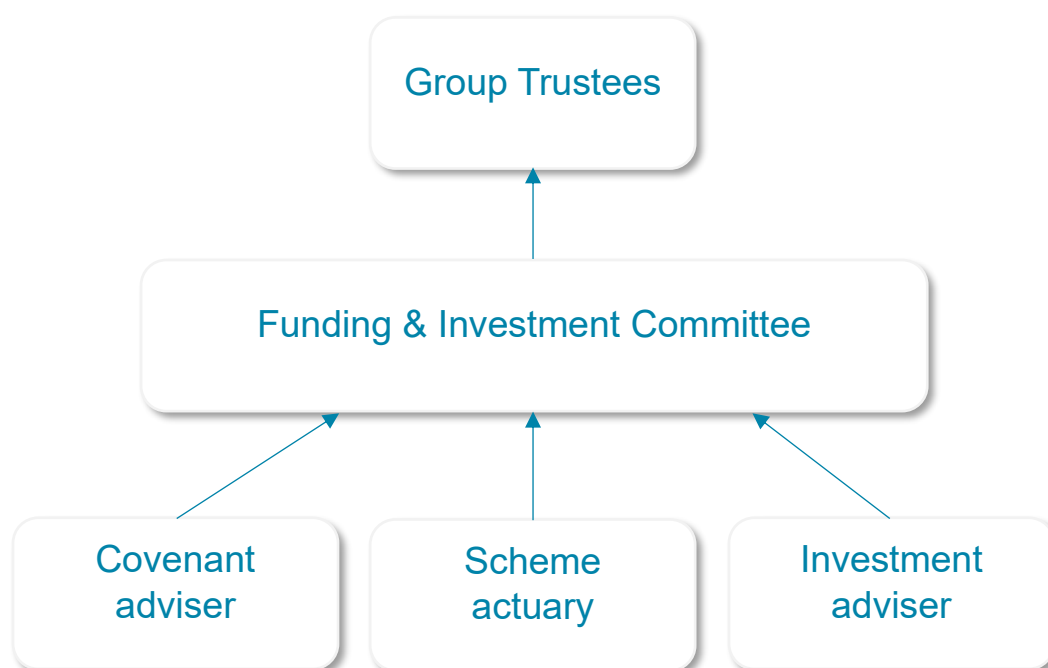
1. ensuring investment proposals explicitly consider the impact of climate risks and opportunities;
2. engaging with the investment managers to understand how climate risks are considered in their investment approach;
3. working with the investment consultant and investment managers to ensure that stewardship activities are being undertaken appropriately on the Group's behalf and relevant climate-related metrics as set out in the TCFD recommendations are disclosed.

Activity for the Group's Year 1 report

The F&IC met with its investment adviser several times during the Group year to work through the TCFD recommendations and ensure a comprehensive understanding of the climate-related risks and opportunities that affect the Group. As part of this the F&IC challenged its investment adviser on the information provided via the investment managers in respect of the climate related risks and opportunities described on page 11 to 15 of this report.

Changes expected for the Group's Year 2 report

The Group Trustee has spent a considerable amount of time and resource in understanding the Group's climate-related risks and opportunities as part of the Group's first TCFD report. The Group Trustee expects the required time and resource to reduce in future years.



Role of the other advisers or stakeholders deemed relevant

Investment Consultant

The Group Trustees' investment consultant, Aon, provides strategic and practical support to the Group Trustees and the F&IC on managing climate-related risks and opportunities, and on compliance with the Department for Work and Pensions' statutory guidance for pension schemes. In practical terms, the majority of support to the Group Trustees in this area is delivered by Aon in their role as investment consultant. The Group Trustees have noted Aon's qualifications and expertise in this area, including their participation in cross-industry initiatives such as the Investment Consultants' Sustainability Working Group (ICSWG) and Cambridge Institute for Sustainability Leadership (CISL), and have reviewed Aon's 'climate competence' summary in line with the ICSWG's recommendations.

Aon's support includes provision of regular training and updates on climate-related issues and climate change scenario modelling to enable the F&IC and the Group Trustees to assess the Group's exposure to climate-related risks.

Group Actuary

The Group Actuary, Philip Dennis, will help the Group Trustees assess the potential impact of climate change risk on the Group's funding assumptions.

Covenant adviser

The Group Trustees' covenant adviser, Aon, helps the Group Trustees understand the potential impact of climate change risk on the covenant of the Principal Employer (Northern Electric plc) and each of the Participating Employers (CallEnergy Resources Limited, Integrated Utility Services Limited, Northern Powergrid (Northeast) plc, Vehicle Lease and Service Limited, Northern Powergrid (Yorkshire) plc).



Strategy

It is crucial to think strategically about the climate-related risks and opportunities that will impact the Group if we are to stand a chance of mitigating the effects of climate change.

Assessing the Group's exposure to climate-related risks and opportunities is key to understanding the future impact climate change could have on the Group.



What climate-related risks are most likely to impact the Group?

Assessing the Group's exposure to climate-related risks and opportunities is key to understanding the impact climate change could have on the Group in the future.

The Group Trustees have carried out a qualitative risk assessment on each asset class in which the Group is invested, over the time horizons felt to be most applicable. From this the Group Trustees have identified which of the climate-related risks and opportunities could have a material impact on the Group.

The Group's investment portfolio is diversified across a range of different asset classes including equities, credit, real estate and liability driven investments ("LDI"). Although there are also AVCs within the Group, they are small in size compared to the Group's defined benefit liabilities and, therefore, deemed to be immaterial for the purposes of this exercise.

Given the number of strategies used in the Group, the Group Trustees have completed a best endeavours exercise to analyse the climate-related risks of each asset class.

How the risk assessment works



Risk categories

In the analysis, the climate-related risks have been categorised into physical and transitional risks.

Transition risks are associated with the transition towards a low-carbon economy.

Physical risks are associated with the physical impacts of climate change on companies' operations.



Ratings

The analysis uses a RAG rating system where:

Red denotes a high level of financial exposure to a risk.

Amber denotes a medium level of financial exposure to a risk.

Green denotes a low level of financial exposure to a risk.



Time horizons

The Group Trustees assessed the climate-related risks and opportunities over multiple time horizons and decided the most appropriate time horizons¹ for the Group are:

- short term: 1-3 years.
- medium term: 4-10 years
- long term: 11-20 years¹

¹ When deciding the relevant time horizons, the Group Trustees have taken into account the liabilities of the Group and its obligations to pay benefits.

Climate-related risk assessment

Equity is deemed a medium to high-risk area in terms of exposure to climate-related risks, indicated by the amber and red ratings over all time horizons. As extreme weather events become more frequent, they are likely to have a growing impact at a portfolio level and this is set to be continually monitored by the Group. The Group has already undertaken some de-risking activity (including a reduced allocation to equities) to consolidate its strong funding position and will consider further opportunities to de-risk on reviewing the strategy later in 2023. This would be expected to mitigate the impact climate change has on the Group, noting that reducing the Group's exposure to equity as an asset class can help alleviate these risks.

Similarly, the risks associated with insurance-linked securities are also indicated as amber across all time horizons and there is particular exposure to physical risks which will be impacted by the increased severity of extreme weather events. This could have a direct negative impact on the Group but it is noted that, whenever there is an increase of such incidences, the manager believes this will ultimately increase demand for insurance coverage which expands the market.

Property is also a high-risk area, particularly in relation to physical climate risks in the medium to long term. The static nature of property investments presents a risk to the Group, particularly if they are in regions that are vulnerable to climate change. The manager recognises the likely increased frequency and severity of acute physical climate-related risks in the long term. Risk results for the manager present a predominately medium financial exposure to acute and chronic physical climate risks in the long term and the potential financial exposure of the risk may heighten in the longer term.

Fixed income is also highlighted as having an amber risk rating over the medium to long term time horizon, with specific risks attributed to government bonds. The main risks lie within the Policy & Legal and Reputational category as technological and regulatory changes associated with the global transition to a lower carbon economy are set to accelerate in the next five to seven years.

The Group's liability driven investment strategy invests in UK Government bonds, cash instruments and swaps to manage risk. Most governments in developed markets – including the UK – have set carbon reduction targets. These assets provide a good level of protection against interest and inflation rate changes that might arise from climate-related risks.

The output of the climate-related risk assessment is shown in the appendix. Based on this analysis, the Group Trustees identified that:

- The managers who engaged with the process provided insightful commentary on and assessment of climate risks.
- The fund managers are more concerned by transition risks than physical climate risks and this is in line with their portfolio allocation as they face higher transition risks.
- There were no mandates where significant concerns were raised needing immediate action.
- There were significant differences in the way managers assessed climate risk, which may represent methodological rather than real differences in risk exposure.

At the time of writing some of the Group's fund managers did not provide the information the Group Trustees requested:

- BlackRock provided generic information and not specifically in relation to the LDI strategy and the ARBF.
- Insight provided very limited detail.

Impact of climate change

The world's climate is already, on average, 1°C warmer than in preindustrial times (broadly the period up to 1850). Most climate scientists anticipate that with current action on climate change, by 2100, the world will be between 2°C and 3°C warmer (current commitments made as part of the Paris Agreement, if implemented, put the trajectory at 2.3 to 2.6°C), noting that averages mask the differences that will be felt regionally.

Following publication of the IPCC's sixth report, the Group Trustees recognise the impact that Transition and Physical risks may have on the Group's portfolios in the future unless action is taken to mitigate these risks.

The Group Trustees, through their advisor, are, therefore, engaging with BlackRock and Insight in particular, to encourage them to better support the Group with their understanding of climate risks.

Please see the appendix for full assessment of each asset class.

Covenant adviser assessment

The Group Trustees' covenant adviser has noted that the environmental risk is moderately negative and reflects the exposure of Northern Powergrid's distribution businesses to physical climate risk. This exposure is mitigated by reinforcing the distribution network and regulatory protections that reduce the adverse impact on operational cash flows of more extreme weather events.

The Group is fully funded on a technical provisions (TP) basis to the extent that the deficit repair contributions (DRCs) have ceased. As a result of this, the Group is not reliant on DRCs as the Group is both fully funded and hedged so the sponsor covenant risk is reduced.

An explanation of the risk categories

In the analysis, the climate-related risks have been categorised into physical and transitional risks.

Transition risks

Transition risks are those related the ability of an organisation to adapt to the changes required to reduce GHG emissions and transition to renewable energy. Within transition risks, there are four key areas: policy and legal, technological innovation, market changes, and reputational risk.

Policy and legal

Examples

- Increased pricing of GHG emissions.
- Enhanced emissions-reporting obligations.
- Regulation of existing products and services.
- Exposure to litigation.

Potential financial impacts

- Increased operating costs (e.g., higher compliance costs, increased insurance premiums).
- Write-offs, asset impairment and early retirement of existing assets due to policy changes.
- Increased costs and/or reduced demand for products and services resulting from fines and judgements.

Technology

Examples

- Substitution of existing products and services with lower emissions.
- Unsuccessful investments in modern technologies.
- Cost to transition to lower emissions technology.

Potential financial impacts

- Write-offs and early retirement of existing assets.
- Reduced demand for products and services.
- Research and development expenditures in new and alternative technologies.
- Capital investments in technology development.
- Costs to adopt new practices and processes.

Market

Examples

- Changing customer behaviour.
- Uncertainty in market signals.
- Increased cost of raw materials.

Potential financial impacts

- Reduced demand for goods and services due to shift in consumer preferences.
- Increased production costs due to changing prices and requirements.
- Abrupt and unexpected increases in energy costs.
- Change in revenue mix and sources, resulting in decreased revenues.
- Re-pricing of assets (e.g., fossil fuel reserves, land valuations, securities valuations).

Reputation

Examples

- Shifts in consumer preferences.
- Stigmatisation of sector.
- Increased stakeholder concern or negative stakeholder feedback.

Potential financial impacts

- Reduced revenue from decreased demand for goods and services.
- Reduced revenue from decreased production capacity (e.g., delayed planning approvals, supply chain interruptions)
- Reduced revenue from negative impacts on workforce management and planning (e.g., employee attraction and retention)
- Reduction in capital availability

Physical risks

Physical risks are those related to the physical effects of climate change and environmental degradation. Such risks may have financial implications for organisations, such as direct damage to assets and indirect impacts from supply chain disruption.

Physical risks fall into two categories: acute and chronic. Acute physical risks arise from extreme climate and weather-related events such as flooding and wildfires. Chronic physical risks arise from longer-term shifts in climate and weather patterns over time or a gradual loss of ecosystems, for example an increase in temperature or ocean acidification.

Climate-related opportunities

The Group Trustees have identified some climate-related opportunities which may be suitable for the Group:



Cleaner energy

Green power generation,
clean technology innovation,
sustainable biofuels



Environmental resources

Water,
agriculture,
waste management



Energy and materials efficiency

Advanced materials,
building efficiency,
power grid efficiency



Environmental services

Environmental protection,
business services

The Group's investment adviser also raises relevant and appropriate opportunities which are aligned with the Group Trustees' overall approach to responsible investment and management of climate-related risks and opportunities.

The Appendix sets out the opportunities which were identified by the Group Trustees' managers as part of the qualitative assessment.

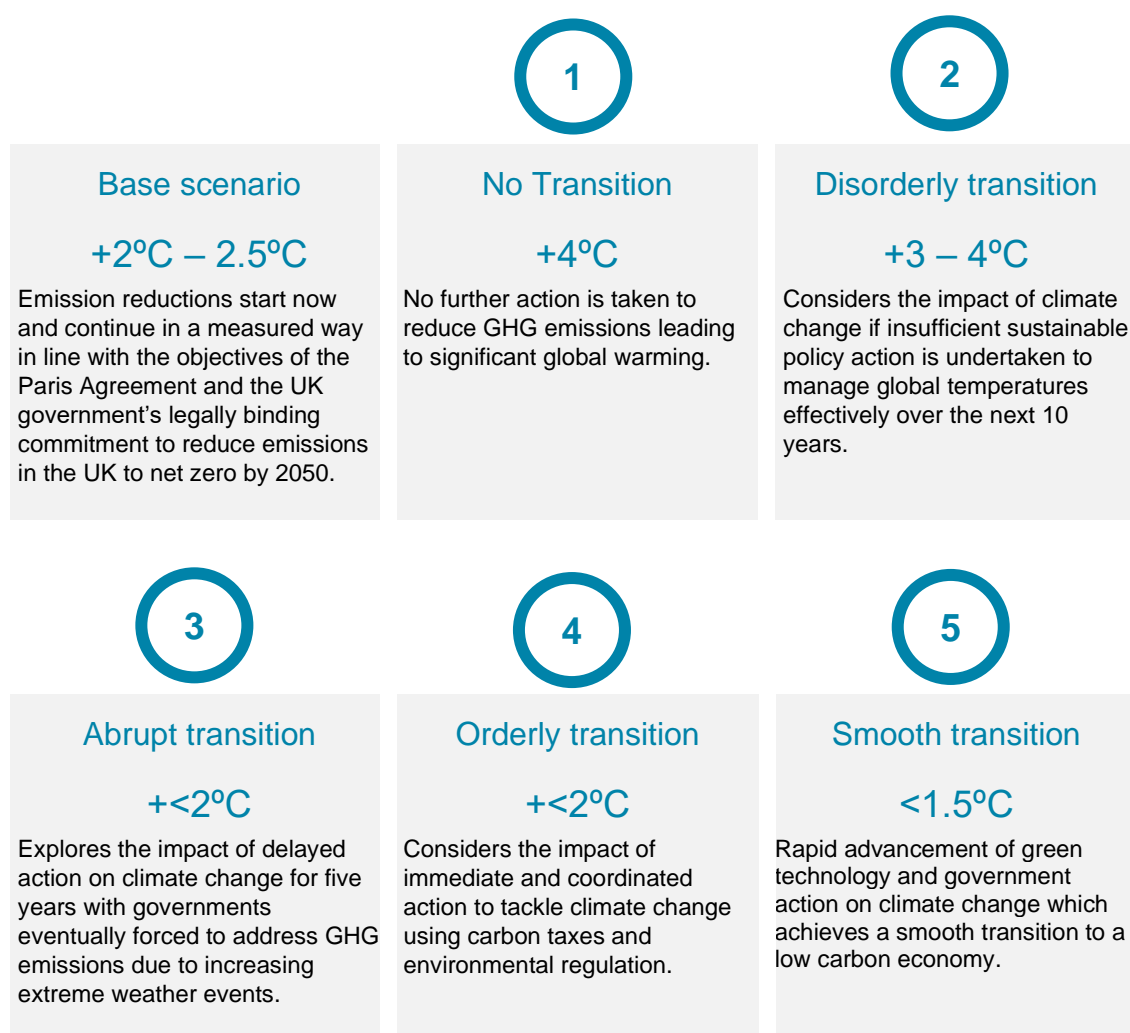


How resilient is the Group to climate change?

The Group Trustees have undertaken climate change scenario analysis to better understand the impact climate change could have on the Group's assets and liabilities.

The analysis looks at five climate change scenarios. Each scenario considers what might happen when transitioning to a low carbon economy under different conditions. The Group Trustees have chosen these scenarios because they believe that those scenarios provide a reasonable range of possible climate change outcomes. The scenarios were developed by Aon and are based on detailed assumptions (further information around this is shown in the appendix). They are only illustrative and are subject to considerable uncertainty.

A "base case" scenario was established by the Group Trustees' investment consultant, Aon, against which the five climate change scenarios are compared.

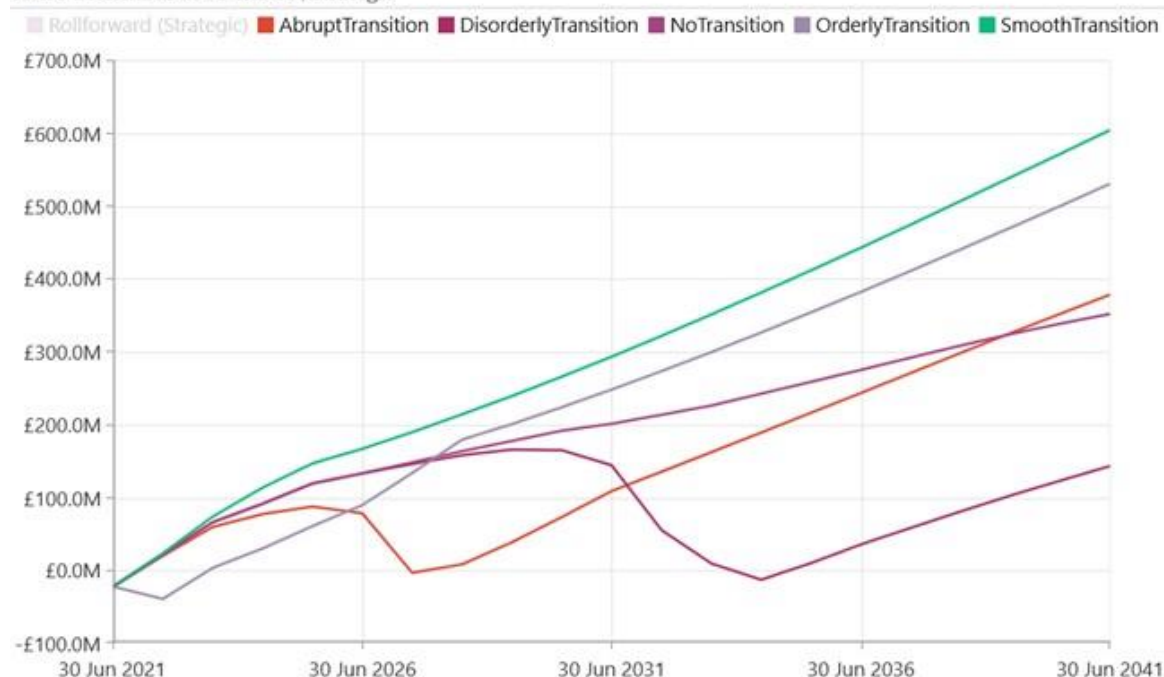


Impact Assessment

The F&IC reviewed scenario analysis which considered the potential impact of climate change on the Group's strategic asset allocation and liabilities (measured on the strategic liability basis) and, therefore, its funding position. The analysis is presented in the chart and table below:

Funding level projections under each climate scenario

Aon's deterministic scenarios | Strategic



Source: Aon. See Appendix for further information on the modelling assumptions used.

The Group's portfolio runs a low-risk investment strategy, with a significant allocation to liability matching assets. The scenario analysis shows that the Group is relatively resilient to climate change risk due to the high allocation to bonds which are expected to be less impacted by climate change risks compared to higher risk/higher growth assets such as equities.

The chart above shows what could happen to the Group's funding surplus/deficit under 5 different climate scenarios, projected up to 30 years into the future. Depending on the scenario, the projected path of the funding level will vary.

Asset return projections under the climate change scenarios

Projected asset returns (% p.a.)	Base case	No transition	Disorderly transition	Orderly transition	Abrupt transition	Smooth transition
Short term	0.9	0.7	0.7	(0.5)	0.4	1.1
Medium term	1.0	0.6	0.3	0.8	0.3	1.1
Long term	1.2	0.6	0.2	1.0	0.9	1.3

Source: Aon.

Conclusions

Based on the F&IC's analysis, the Group Trustees consider that the investment strategy is relatively resilient to climate change risk, acknowledging that there are scenarios that could lead to a material deterioration in the funding level. The decision to reduce the Group's allocation to equities, as well as the level of diversification in the Group's assets and the degree of liability hedging in place, will help mitigate the risk.

Of these scenarios, the Group Trustees believe a Disorderly Transition scenario to be of most concern, given the potential for this scenario to impact on the Group's funding level within the timeframe of the existing long-term funding plans. Under that scenario, the Group is projected to experience a significant deficit shock within the next decade.

The Group Trustees, supported by the F&IC, will consider further opportunities to mitigate these potential shocks, such as further de-risking and attention to climate transition, to provide further downside protection.

Action taken following the scenario analysis

The Group Trustees have not taken any action as a result of the climate change scenario modelling given the de-risking that had already been agreed.



Risk management

We must have processes to identify, assess and manage the climate-related risks that are relevant to the Group and these must be integrated into the overall risk management approach taken.

Reporting on our risk management processes provides context for how we think about and address the most significant risks to our efforts to achieve appropriate outcomes.



Our process for identifying and assessing climate-related risks

The Group Trustees have established a process to identify, assess and manage the climate-related risks that are relevant to the Group. This is part of the Group's wider risk management framework and is how the Group Trustees monitor the most significant risks to the Group in its efforts to achieve appropriate outcomes.



Qualitative assessment

The first element is a qualitative assessment of climate-related risks and opportunities which is prepared by the Group Trustees' investment consultant and reviewed by the Group Trustees.



Quantitative analysis

The second element is quantitative in nature and is delivered by means of climate change scenario analysis, which is provided by the Group Trustees' investment consultant and reviewed by the Group Trustees.

Together these elements give the Group Trustees a clear picture of the Group's exposure to climate-related risks. All risks and opportunities are assessed with reference to the relevant time horizons that the Group Trustees have identified.

When prioritising the management of risks, the Group Trustees assess the materiality of climate-related risks relative to the impact and likelihood of other risks to the Group. This helps the Group Trustees focus on the risks that pose the most significant impact.

The Group's investment managers

The Group Trustees recognise the Group's exposure to the climate-related risks stemming from transitioning to a lower-carbon economy, because of physical and transition risks from shocks caused directly by climate change. As a result, the Group Trustees conducted an exercise via a manager questionnaire to better understand and assess the Group's investment managers' policies and capabilities when incorporating climate related risks, disclosures and opportunities within their investment strategies.

As part of this assessment, the Group Trustees have sent:

- A due diligence questionnaire asking their investment managers to identify the most significant climate-related risks and opportunities affecting the Group, and to quantify these risks as described on page 12 of this report; and
- The "top" questions (as outlined in guidance from the Pensions Climate Risk Industry Group²) to their investment managers supplemented by some of their own questions. These questions were designed to assist the Group Trustees with their assessment of each manager's capabilities and approach to climate management focused on areas such as TCFD reporting, managers' ability to conduct climate scenario analysis, engagement and escalation policies, managers' ability to provide carbon-related data and align their strategies to a particular temperature level.

All the Group's managers responded to the climate risk management questionnaire. In summary:

- Five of the managers have produced (or are in the process of producing) their TCFD report, setting out their approach to managing climate related risks. The Group Trustees will continue monitoring the managers' alignment with the industry TCFD reporting in future.
- Five of the managers conduct climate-related risk scenario analysis and two of the managers are currently in the process of setting up this analysis at an asset class level.
- Three of the managers have set temperature alignment targets which apply to the strategies employed by the Group. Managers will therefore invest in a way which is aligned that of the Paris Agreement of limiting global temperature increases to below 2 degrees by the end of the century.

Overall, the Group Trustees conclude that the managers have adequate frameworks and processes in place to ensure climate-related risks and opportunities are considered within their mandates associated with the transition to low carbon economy. In addition, the majority of the managers are participating in market-leading industry initiatives and frameworks, such as United Nations supported Principles of Responsible Investment ("PRI"), Carbon Disclosure Project's ("CDP") climate change programme and Institutional Investors Group on Climate Change ("IIGCC").

In summary the Group Trustees are comfortable with the managers' ability to act in their best interests of the Group and to account for climate-related risks and opportunities in the portfolios that they manage.

² [Aligning your pension scheme with the TCFD recommendations: Part II - Trustee governance, strategy and risk management: how to integrate and disclose climate-related risks \(publishing.service.gov.uk\)](https://publishing.service.gov.uk)

Our process for managing climate related risks

The Group Trustees recognise the long-term risks posed by climate change and have taken steps to integrate climate-related risks into the Group's risk management framework.

The Group Trustees have taken the following steps to integrate climate-related risks into their risk management framework and processes.



Training

The Group Trustees receive training on responsible investment to understand how ESG factors, including climate change, could impact the Group's assets and liabilities.



Advisers

The Group Trustees review their adviser objectives to ensure advisers have appropriate climate capability, and bring important, relevant, and timely climate-related issues to the Group Trustees' attention.



Actuarial and covenant

The Group Trustees ensure that actuarial and covenant advice (which is formally reviewed every three years) incorporates climate-related risk factors where they are relevant and material.

The Group Trustees also seek to understand the climate-related risks to the employer over the short, medium and long term.



Integrated risk management framework

Climate-related risks are included in the Group's wider risk management framework, which is overseen by the F&IC on a regular basis.



Investment strategy

The Group Trustees ensure investment proposals explicitly consider the impact of climate risks and opportunities and seek investment opportunities.



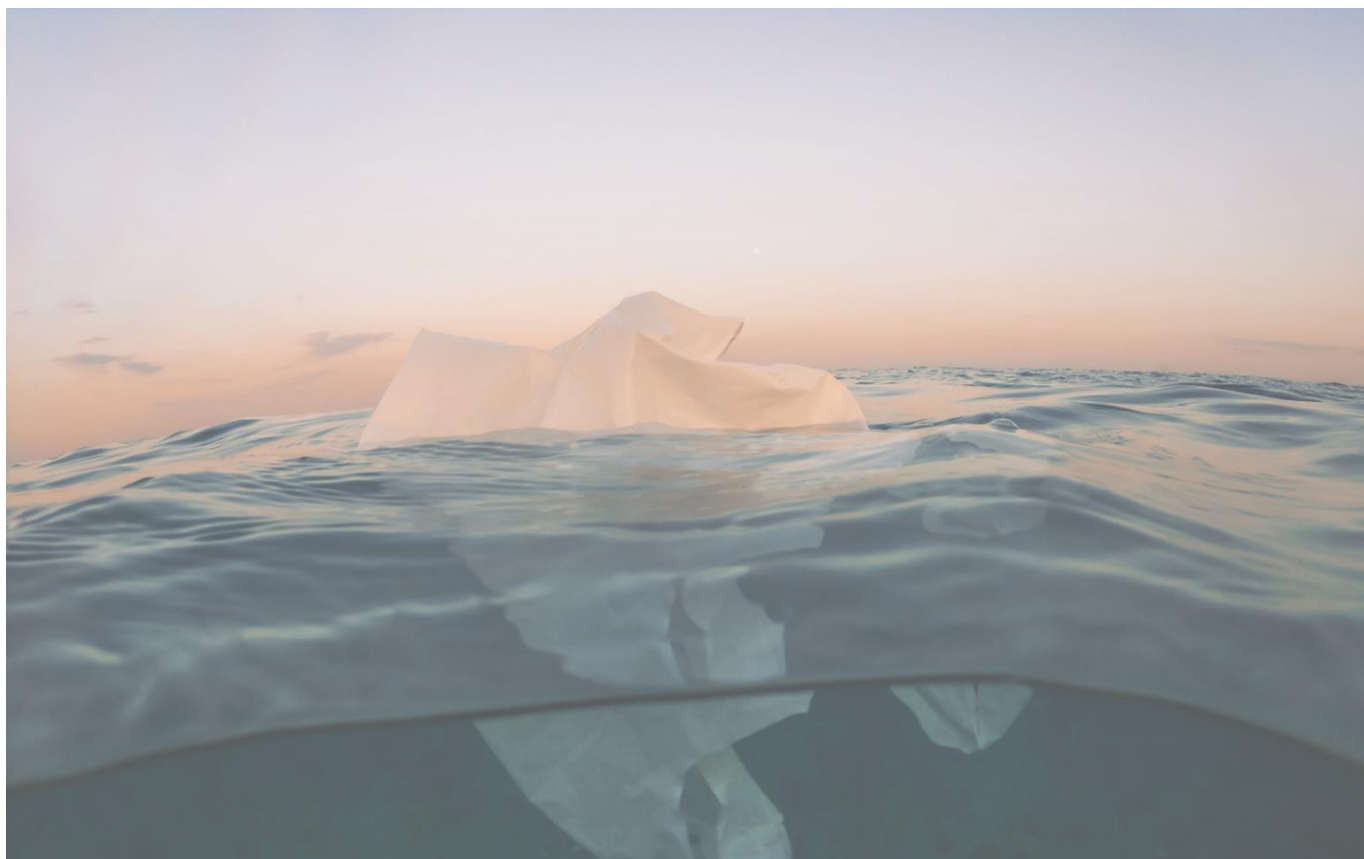
Managers

The Group Trustees engage with the investment managers to understand how climate risks are considered in their investment approach, and stewardship activities are being undertaken appropriately. The F&IC reviews its investment managers at its quarterly meetings and conducts ESG monitoring on them on an annual basis.



Group documentation

The Group Trustees include consideration of climate-related risks in the Group's other risk processes and documents, such as the risk register and the SIP, and regularly review these documents.



Metrics & Targets

Metrics help to inform our understanding and monitoring of the Group's climate-related risks. Quantitative measures of the Group's climate-related risks, in the form of both GHG emissions and non-emissions-based metrics, help us to identify, manage and track the Group's exposure to the financial risks and opportunities climate change will bring.



Our climate-related metrics

The Group Trustees use some quantitative measures to help them understand and monitor the Group's exposure to climate-related risks. This includes information on GHGs in the atmosphere, including water vapour, carbon dioxide, methane, and nitrous oxide, keep the Earth's surface and atmosphere warm because they absorb sunlight and re-emit it as heat in all directions including back down to Earth. Adding more GHGs to the atmosphere makes it even more effective at preventing heat from leaving the Earth's atmosphere.

The metrics the Group Trustees use are:



Total GHG emissions

The total GHG emissions associated with the portfolio. It is an absolute measure of carbon output from the Group's investments and is measured in tonnes of carbon dioxide equivalent (tCO₂e).

This year the Group Trustees were able to obtain scopes 1&2 and scope 3 emissions from the managers separately.



Carbon footprint

Carbon footprint is an intensity measure of emissions that takes the total GHG emissions and weights it to take account of the size of the investment made. It is measured in tonnes of carbon dioxide equivalent per million pounds invested (tCO₂e/£m).



Data quality

A measure of the proportion of the portfolio that the Group Trustees have high quality data for (i.e., data which is based on verified, reported, or reasonably estimated emissions, versus that which is unavailable).

This has been selected on the basis that it provides a consistent and comparable measure of the level of confidence in the data.



Portion of portfolio SBTi aligned

A metric which gives the alignment of the Group's assets with the climate change goal of limiting the increase in the global average temperature to 1.5°C above pre-industrial levels.

It is measured as the percentage of underlying portfolio investments with declared net-zero or Paris-aligned targets that have been verified by the Science based Target initiative (SBTi).



Measuring GHG emissions

Measuring GHG emissions is a key means to enable pension schemes to assess their exposure to climate change. GHGs are produced by burning fossil fuels, meat and dairy farming and some industrial processes. When GHGs are released into the atmosphere, they trap heat in the atmosphere causing global warming and contributing to climate change.

GHGs are categorised into three types or 'scopes' by the GHG Protocol, the world's most used GHG accounting standard.

Scope 1	Scope 2	Scope 3
All direct emissions from the activities of an organisation which are under their control; these typically include emissions from their own buildings, facilities and vehicles	These are the indirect emissions from the generation of electricity purchased and used by an organisation	All other indirect emissions linked to the wider supply chain and activities of the organisation from outside its own operations – from the goods it purchases to the disposal of the products it sells

Scope 3 emissions are often the largest proportion of an organisation's emissions, but they are also the hardest to measure. The complexity and global nature of an organisation's value chain make it hard to collect accurate data. For more information, please see the appendix.

The Group Trustees have agreed that their investment adviser, Aon, will collect information from the Group's managers on the GHG emissions within their portfolios. This information will be used to calculate climate-related metrics for the Group's portfolio. The Group's metrics are as follows:

Total GHG emissions	153,564 tons CO ₂ e	The total GHG emissions associated with the portfolio. It is an absolute measure of carbon output from the Group's investments and is measured in tonnes of carbon dioxide equivalent (tCO ₂ e).
Carbon footprint	93.0 tons CO ₂ e/£m	Carbon footprint is an intensity measure of emissions that takes the total GHG emissions and normalises it to take account of the size of the investment made. It is measured in tonnes of carbon dioxide equivalent per million pounds invested (tCO ₂ e/£m).
Portion of portfolio SBTi aligned	41.6%	This portfolio alignment metric measures the alignment of the Group's portfolio with a given climate outcome, based on the % of investments in that portfolio with declared net zero or Paris-aligned targets.
Data quality	61.2%	A measure of the proportion of the portfolio where the Group Trustees have high quality data.

Data observations

Because not all the Group's managers were able to provide all the requested data, the reported emissions metrics do not include all the GHG emissions within the Group's portfolio. This means that the metrics show those GHG emissions to be lower than they really are.

The Group Trustees also note that there is not yet an industry-wide standard on calculating some of these metrics and that different managers may use different methods and assumptions when providing data.

These issues are commonplace across the industry at the current time and highlight the importance of TCFD-aligned reporting to improve transparency on carbon-related data. The Group Trustees expect that in the future better information will be available from managers as the industry aligns to expectations and best practice standards.

The table below summarises the observations on data gathered from the Group's managers:



Current position

Aon requested emissions data from the Group's managers, which represent all of the Group's assets.



Data availability

Data was received from managers covering 61.2% of the Group Trustees' portfolio. Data was not available for around 38.8% of the Group's assets.

Data availability

Data availability for the carbon emission for the Group's assets amounted to 61.2%. The main detractors from data availability were:

- Investment managers providing carbon data applicable only to a part of their portfolio:
 - a. The managers are only able to source information for part of their portfolios, due to unavailability of data, especially for alternative investment asset classes.
- Absence of meaningful data for assets such as insurance linked securities and derivatives.
 - a. The manager of the insurance-linked securities mandate does not track or record carbon emissions data. Due to the nature of the asset class as it is not currently possible to collate data on carbon emissions that can be attributed to the fund.
 - b. The manager of the Bonds Plus fund is not able to report on carbon emissions due to the complete lack of data available from any data provider and the nature of the underlying derivatives based assets.

Data availability by manager

- LGIM
 - a. The manager started tracking the data on the portion of the portfolio SBTi aligned since 30 September 2022. Hence, the data is shown as at Q3 2022.
- CBRE
 - a. Currently not possible to have net zero targets validated by SBTi for buildings. Instead, CBRE provided % of assets with a sustainability plan.
 - b. Additionally, the manager set a net zero target for the fund of 2040 or sooner.
- Securis
 - a. The manager cannot track or record carbon emissions data as the portfolio is exclusively in insurance-linked securities
 - b. The manager does not track GHG emissions data, or any associated global temperature rises on investments in the portfolio

- Insight
 - a. Not able to report on carbon emissions due to the lack of data available from any data provider and the nature of the underlying derivatives-based assets.

Aon, on behalf of the Group Trustees, will engage with the Group's managers that were unable to supply full emissions data for this analysis in order to improve carbon data transparency and reporting in the future.

The table below shows a more detailed breakdown of the scope 1 and 2 emissions from each asset class in the Group's portfolio (where available).

Asset class	Asset Valuation (% of total AUM)	Total Scope 1&2 emissions (tCO ₂)	Scope 1&2 carbon footprint (tCO ₂ /£m invested)	Portion of portfolio SBTi aligned (% of assets)
Equities	7.5%	12,747	103.0	49.3%
Alternatives	23.1%	35,133	116.8	33.7%
Liability Matching Assets	69.2%	105,685	128.0	66.4%
Cash	0.3%	-	-	-
Total	100%	153,564	93.0	41.6%

Source: Investment managers.

Note 1: Carbon data was provided in USD terms, Aon has converted it to GBP terms using the 31 March 2022 USD/ GBP exchange rate.

Note 2: Numbers may not sum up due to rounding.

Note 3: Cash has been excluded from the analysis on the basis of materiality.

Looking to the future

Our climate-related target

Climate-related targets help the Group Trustees track efforts to manage the Group's climate-change risk exposure.

The Group Trustees have set a target for improving the data quality metric. Without meaningful data from the investment managers, it is extremely hard for them to measure the Group's climate-risk exposure. So, it is important to set a target to improve the quality of GHG emissions data from the managers.



Based on the observation of data quality summarised on the previous pages, the Group Trustees have agreed to : the following data quality target for its Group's portfolio:

By five years' time, achieve above 90% coverage of carbon emissions data across all asset classes split across scopes 1 and 2.

The Group Trustees recognise that this target may be revised in the future years of reporting when data availability improves.

The Group's performance against the target will be measured and reported on every year. Over time, this will show the Group's progress against the target.

The Group Trustees will be taking the following steps to reach the target:

Step 1 **Increase data availability**

Observation: data was unavailable for two mandates and the data coverage was limited for certain mandates, mainly within the alternative and liability matching assets.

Solution: The Group Trustees will engage with the managers directly, or through Aon to request improved data availability and coverage for mandates that lacked data. Through engagement, it is expected that this will identify opportunities to improve data quality or investigate alternative sources of data. However, for some of the asset classes in which the Group invests, particularly in the alternative mandates, it may be some time before meaningful carbon data becomes available.

Step 2 **Facilitate consistent reporting**

Observation: The Group Trustees have relied on manager data, however, due to the lack of industry-wide standard on calculating some of these metrics, the information may not be consistent year on year.

Solution: The Group Trustees will engage with the managers directly, or through Aon to ensure that the carbon information provided is consistent on the annual basis. However, the Group Trustees recognise that the reporting may change in line with evolving industry practices.

Appendices

Glossary

- Governance** refers to the system by which an organisation is directed and controlled in the interests of shareholders and other stakeholders.³ Governance involves a set of relationships between an organisation's management, its board, its shareholders, and other stakeholders. Governance provides the structure and processes through which the objectives of the organisation are set, progress against performance is monitored, and results are evaluated.⁴
- Strategy** refers to an organisation's desired future state. An organisation's strategy establishes a foundation against which it can monitor and measure its progress in reaching that desired state. Strategy formulation generally involves establishing the purpose and scope of the organisation's activities and the nature of its businesses, taking into account the risks and opportunities it faces and the environment in which it operates.⁵
- Risk management** refers to a set of processes that are carried out by an organisation's board and management to support the achievement of the organisation's objectives by addressing its risks and managing the combined potential impact of those risks.⁶
- Climate-related risk** refers to the potential negative impacts of climate change on an organisation. Physical risks emanating from climate change can be event-driven (acute) such as increased severity of extreme weather events (e.g., cyclones, droughts, floods, and fires). They can also relate to longer-term shifts (chronic) in precipitation and temperature and increased variability in weather patterns (e.g., sea level rise). Climate-related risks can also be associated with the transition to a lower-carbon global economy, the most common of which relate to policy and legal actions, technology changes, market responses, and reputational considerations.⁷
- Climate-related opportunity** refers to the potential positive impacts related to climate change on an organisation. Efforts to mitigate and adapt to climate change can produce opportunities for organisations, such as through resource efficiency and cost savings, the adoption and utilization of low-emission energy sources, the development of new products and services, and building resilience along the supply chain. Climate-related opportunities will vary depending on the region, market, and industry in which an organisation operates.⁸

³ A. Cadbury, [Report of the Committee on the Financial Aspects of Corporate Governance](#), London, 1992.

⁴ OECD, [G20/OECD Principles of Corporate Governance](#), OECD Publishing, Paris, 2015.

⁵ TCFD, [Recommendations of the Task Force on Climate-related Financial Disclosures](#), 2017

⁶ Ibid

⁷ Ibid

⁸ Ibid

Greenhouse gas emissions (“GHG”) scope levels⁹	<p>Greenhouse gases are categorised into three types or ‘scopes’ by the Greenhouse Gas Protocol, the world’s most used greenhouse gas accounting standard.</p> <p>Scope 1 refers to all direct GHG emissions.</p> <p>Scope 2 refers to indirect GHG emissions from consumption of purchased electricity, heat, or steam.</p> <p>Scope 3 refers to other indirect emissions not covered in Scope 2 that occur in the value chain of the reporting company, including both upstream and downstream emissions. Scope 3 emissions could include: the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity, electricity-related activities (e.g., transmission and distribution losses), outsourced activities, and waste disposal.¹⁰</p>
Value chain	<p>refers to the upstream and downstream life cycle of a product, process, or service, including material sourcing, production, consumption, and disposal/recycling. Upstream activities include operations that relate to the initial stages of producing a good or service (e.g., material sourcing, material processing, supplier activities). Downstream activities include operations that relate to processing the materials into a finished product and delivering it to the end user (e.g., transportation, distribution, and consumption).¹¹</p>
Climate scenario analysis	<p>is a process for identifying and assessing a potential range of outcomes of future events under conditions of uncertainty. In the case of climate change, for example, scenarios allow an organisation to explore and develop an understanding of how the physical and transition risks of climate change may impact its businesses, strategies, and financial performance over time.¹²</p>
Net zero	<p>means achieving a balance between the greenhouse gases emitted into the atmosphere, and those removed from it. This balance – or net zero – will happen when the amount of greenhouse gases add to the atmosphere is no more than the amount removed.¹³</p>

⁹ World Resources Institute and World Business Council for Sustainable Development, [The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard \(Revised Edition\)](#), March 2004.

¹⁰ PCC, [Climate Change 2014 Mitigation of Climate Change](#), Cambridge University Press, 2014.

¹¹ TCFD, [Recommendations of the Task Force on Climate-related Financial Disclosures](#), 2017

¹² Ibid

¹³ Energy Saving Trust, [What is net zero and how can we get there? - Energy Saving Trust](#), October 2021

Appendix – climate-related risk assessment

What are climate-related risks?

The notion that there are “climate risks” in financial portfolios is now a well-established one. So, what are climate risks? In short, the idea is that climate change impacts the financial performance of companies and therefore also the risk-return profile of the securities they issue. Climate risks are typically categorised along two dimensions:

Transition risks

Transition risks relate to the need to transition to a low-carbon economy, including development of, and investment in, new technologies and services that support this transition as well as government policy to aid in the transition. Specific market-based activities comprise the mitigation of carbon emissions, and/or adaptation to be resilient against climate change:

- **Mitigation:** technologies and services that increase energy efficiency, relate to increased renewable energy uptake and decreased demand for fossil fuels, and/or capture or sequester carbon dioxide.
- **Adaptation:** infrastructure resiliency efforts, business model shifts (e.g. changing geographic location of production and/or sales, introduction of new products and services and aligning business models with new environmental conditions).

Potential financial impacts from this transition include:

- **Revenue loss (demand contraction):** reduced demand for fossil fuels, related services, and energy consuming products.
- **Stranded assets:** devaluation/impairment or “asset stranding” of fossil fuel reserves.
- **Revenue growth:** growth in renewable energy, emergence of new industries, including carbon capture and sequestration, smart grid technologies, energy-efficient products, infrastructure adaptations, and green chemistry solutions.
- **Long-term cost reductions:** operational cost reduction from investments in updated infrastructure and technologies that facilitate the transition to a low-carbon, resilient economy.

Furthermore, the transition comes with policy and legal risks, including:

- **Carbon pricing mechanisms** (e.g. carbon taxes), already implemented in over 25 countries.
- **Litigation risk:** driven by the failure of companies to mitigate impacts of climate change, failure to adapt to climate change, and the insufficiency of disclosure around material financial risks.

Physical risks

A changing climate can lead to changes in the frequency and severity of extreme or incremental hazards. The TCFD recommendations refer to these hazards as acute and chronic, respectively. Acute hazards represent severe and extreme events and are location specific (e.g. droughts, heatwaves, storms, wildfire, etc). Chronic climate change represents the background incremental changes in, for example: temperature, precipitation and sea-level rise over several decades.

Acute and chronic climate-related hazards

Acute

- Extreme heat
- Extreme rainfall
- Floods
- Droughts
- Storms (e.g., hurricanes)

Chronic

- Water stress
- Sea level rises
- Land degradation
- Variability in temperature
- Variability in precipitation

The Group's investments

Listed Infrastructure

Time horizon	Physical risks		Transition risks			
	Acute	Chronic	Policy and Legal	Technology	Market	Reputation
Short (1-3 years)	High Risk (Green)					
Medium (4-10 years)	High Risk (Green)	Medium Risk (Yellow)	High Risk (Green)	High Risk (Green)	High Risk (Green)	High Risk (Green)
Long (11-20 years)	High Risk (Yellow)					

Source: Manager.

Physical risks

The portfolio is mainly exposed to transition and physical risks over the long term. The manager recognises that beyond the next decade, infrastructure companies (toll roads, airports and communication infrastructures) could encounter modest acute and chronic physical risk that can lead to financial loss. The manager has also assessed that there is a modest risk that infrastructure companies could encounter higher insurance costs as a consequence of extreme weather events and a higher level of operating costs.

Transition risks

The manager recognises that there is long-term risk associated with the size and scope of the changes that are required to transition to net zero, which will affect infrastructure and regulated utilities beyond 10 years. However, the manager's assessment is that there will be minimal change that will affect infrastructure and regulated utilities in the next 10 years.

Property

Property Unit Trust

Time horizon	Physical risks		Transition risks			
	Acute	Chronic	Policy and Legal	Technology	Market	Reputation
Short (1-3 years)	Green					
Medium (4-10 years)	Green		Yellow		Green	
Long (11-20 years)	Yellow		Red	Yellow		

Source: Manager.

Physical risks

The manager has undertaken physical risk screening for all standing assets utilising the service provider Four Twenty Seven (now Moody's). Risk thresholds are characterised through scores for six hazards: floods, heat stress, hurricanes & typhoons, sea level risk, water stress and wildfires. Acute risks are characterised predominately through scores for flooding hazards including fluvial, pluvial and flash flooding. The manager recognises the likely increased frequency and severity of acute physical climate-related risks in the long term. Risk results for the manager present a predominately medium financial exposure to acute and chronic physical climate risks in the long term. However, the potential financial exposure of the risk may heighten in the longer term and so will be reviewed and monitored over time.

Transition risks

The manager recognises that 2050 is a key date for achieving net zero carbon emission for the UK. Risks associated with building-related policy and legislation are largely unknown at present. As such, there is a higher potential financial risk exposure at longer timescales. The manager utilises tools to ensure a forward-looking approach to ESG that enables associated risks and required mitigation measures to be identified and implemented early. The manager is committed to achieve net zero carbon across all of the commercial real estate assets managed for their clients by 2050 or sooner.

UK Property

Time horizon	Physical risks		Transition risks			
	Acute	Chronic	Policy and Legal	Technology	Market	Reputation
Short (1-3 years)	Green					
Medium (4-10 years)	Green		Yellow	Green		Yellow
Long (11-20 years)	Green		Yellow	Green		Yellow

Source: Manager.

Physical Risks

The manager confirmed that its approach to physical climate risk is aligned with the TCFD framework and considers both acute and chronic physical risks. Acute physical risks arise from changes in event-driven hazards, such as an increased severity of cyclones, hurricanes or floods. The manager confirmed that the portfolio has a medium average exposure to floods, low exposure to hurricanes and typhoons (extreme winds), and no exposure to sea level rise. Individual assets might have different exposures to individual hazards.

Locations with very high physical risk exposure are not favoured in the manager's investment strategies but are not excluded if an asset is considered to be resilient to such risks or mitigation measures can be implemented to create a resilient asset. The manager screens for the following chronic risks as part of their standard climate risk assessments: water stress, increased rainfall, rising urban temperatures, sea level rise and wildfires.

Transition risks

The manager assesses transition risk on asset level and uses Carbon Risk Real Estate Monitor (CRREM) methodology which allows real estate owners and asset managers to estimate exposure to climate-related market risk using country and asset type specific decarbonization pathways with an open-source tool. Based on CRREM analysis, the most material short-term market risk is consumer preference and demand for net zero aligned buildings. CBRE also identified that the portfolio's market value weighted average stranding¹⁴ year is 2038. When combined with the processes to verify and mitigate stranding risk and a targeted increase in data coverage, the portfolio is classified as low risk.

Insurance-Linked Securities

Time horizon	Physical risks			Transition risks		
	Acute	Chronic	Policy and Legal	Technology	Market	Reputation
Short (1-3 years)	High			Low		
Medium (4-10 years)	High			Low		
Long (11-20 years)	High			Low		

Source: Manager.

Physical risks

The fund has exposure to climatological perils which are susceptible to increased level of risk due to climate change. There is potential for increased severity and frequency of extreme weather events (acute effects) which the manager believes is driven by rising temperatures, rising sea levels and changes in weather patterns (chronic effects). These may have a direct negative financial impact on the Fund. However, when there is increased incidence and severity of these natural catastrophes, the manager believes this will ultimately increase demand for insurance coverage and grow the market.

¹⁴ Stranding assets are those which are vulnerable to factors such as environmental challenges, changing resource landscapes, technological innovation, changes in regulations and liability and evolving social norms. Such changes can result in the devaluation or non-performance of assets, thus making them 'stranded'.

Transition risks

The manager anticipates low to medium reputational risk and low financial risk to its technological infrastructure and the market in which it operates. However, it expects there to be increasing reporting and transparency requirements over the short and medium term with it continuing into the longer term. While the TCFD does not apply to the manager at this stage (due to its size and its non-ESG focused investment strategies), the manager anticipates that it will have to consider TCFD reporting in the next year and expects more frequent and detailed ESG reporting demands from its investors.

A transition to a low carbon economy does not change the type of underlying policies or the nature of purchasing insurance coverage. For the very limited cases where coverage is for carbon intensive policies (e.g. underlying insurance covering a coal mine), the manager expects similar uptake of insurance for renewable energy facilities.

Equity

Time horizon	Physical risks		Transition risks			
	Acute	Chronic	Policy and Legal	Technology	Market	Reputation
Short (1-3 years)	Green					Yellow
Medium (4-10 years)	Yellow	Green	Yellow			
Long (11-20 years)	Yellow		Red	Yellow	Red	Yellow

Source: Manager.

Physical risks

In the medium to long term, the manager’s analysis shows exposure to physical risks through its investments and the impact on the wider economy resulting from uncontrolled climate change. As extreme weather events become more frequent, severe, and unpredictable, they are likely to have a growing impact at a portfolio level – especially as impacts become increasingly felt in temperate climates, where much of today’s global equity value is concentrated.

Transition risks

In the short to medium term, the manager views the journey to net zero as presenting an investment opportunity alongside a pressing need to focus on and manage transition risk.

The medium term is a crucial period for the climate transition, as time is running out to stay within the carbon budget of a well-below 2°C future. As a result, policy acceleration is to be expected over the next 10 years, with a significant expansion in carbon pricing across the globe. This may take many forms, either through direct pricing of carbon emissions or indirect pricing through measures such as subsidies for low-emission products.

Over the longer term, most Paris-aligned pathways envision a large drop in demand for fossil fuels, especially coal and oil and internal combustion engine vehicles – with potentially large financial repercussions at a global equity index level depending on companies’ mitigative actions up until that point.

Fixed income

Absolute Return Bond Fund

Time horizon	Physical risks		Transition risks			
	Acute	Chronic	Policy and Legal	Technology	Market	Reputation
Short (1-3 years)	Green					
Medium (4-10 years)	Green		Yellow	Green		Yellow
Long (11-20 years)	Yellow					

Source: Manager.

Note: The heatmap provided by the manager denotes the risks associated with government bonds.

Physical risks

The manager believes that changes to the natural environment, including increased frequency and severity of extreme weather events, present a new set of investment risks for investors. The manager believes with better understanding of climate specific risks and opportunities, investors can position their portfolios according to their risk-appetite, view of the future climate factors and asset allocation. The manager believes that chronic risks can only be viewed as long-term risk, as they begin to understand potential tipping points and impact, and that this is true across asset classes.

Transition risks

Within transition risk, the manager believes that a global transition to a lower carbon economy is underway and is set to accelerate in the next five to seven years. Transition risks and opportunities are a result of primarily of technology and regulatory changes, which will have cross regional and sector impacts. As such, the manager is developing its approach to integrate these risks into its investment process going forward. The manager expects developed market government to be least impacted in terms of expected returns. In the manager's view, most governments in developed markets are members of climate change mitigation initiatives and have set carbon reduction targets. Therefore, they are unlikely to be greatly affected by risk premium adjustments and reallocations.

Bonds Plus Fund

Time horizon	Physical risks		Transition risks			
	Acute	Chronic	Policy and Legal	Technology	Market	Reputation
Short (1-3 years)	Green					
Medium (4-10 years)	Green					
Long (11-20 years)	Green					

Source: Manager.

Physical and transition risks

The manager believes that the fund is not exposed to material physical risks or transition risks because the strategy does not necessarily have fixed allocations to any asset class and often uses derivative instruments to implement positions. This means that even short-term exposures are limited to current investment views and are not long-term holdings (as compared to an investment grade mandate that provides exposure to that asset class).

Furthermore, the asset allocation is dynamic, so positioning to an asset class (such as investment grade credit) may well vary from in any given month depending on the manager's market views. In addition, the strategy is able to take short (negative) positions in assets that are exposed to physical and transition risks, which would switch the fund's exposure to a significant risk from that asset class into a positive exposure from the fund's perspective.

The manager has deemed derivatives to be largely out of scope to this analysis given that they are not providing direct finance to underlying governments or companies and are merely aiming to provide investment returns that are derived from the performance of their underlying investment. Physical bonds will typically be a minority of the actual investments in this strategy.

Appendix – climate-related opportunities

Listed Infrastructure

The manager identified that the renewable energy market represents an attractive investment opportunity. The manager expects that opportunities will become apparent as the pathway to net zero requires the replacement of fossil fuel energy with electric energy, backed by renewable energy, and with the expected increased electrification of economies. To achieve the net zero target, communities will need to invest in renewable energy and increased resilience of the electric grid, both of which are significant opportunities for electric utilities.

Property

Property Unit Trust

The manager believes that commissioning net zero carbon studies will over time present climate-related investment opportunities such as:

- Reduced operating costs through a focus on energy, water and waste efficiency, in a move to more efficient buildings.
- Delivering returns on investment for technology procurement at assets.
- Reduced reliance of fossil fuel energy and potential susceptibility shifts in energy policy, taxes and levies through the use of lower-emission sources of energy.
- Reduced exposure to GHG emissions and therefore less sensitivity to the cost of carbon.
- Reduced risk of early write demands and / or reduced demand by failing to transition to a low carbon economy.
- Reputational gains of aligning to the Paris Commitment which may result in increased demand for good/services and increased revenue through demand for lower emission products and services.

UK Property

The manager is seeing increasing demand from tenants and the wider market for low carbon and climate resilient buildings. The manager is developing mitigation plans to address any climate related risks present in its portfolios. By doing so, the underlying assets within its portfolios will remain attractive to occupiers and maximise building occupancy. In practice, this will mean that the manager looks at investing in low-carbon options, and work with underlying managers to also make these necessary investments. This could include options such as, but not limited to, rooftop photovoltaics, highly energy efficient systems, sustainable transport options and accessible and healthy buildings.

Insurance-Linked Securities

The manager believes that there will be a sustained and growing demand for re/insurance coverage as the market adapts to climate change. For example, for emerging types of risk such as wildfire, there has been an increased demand for coverage resulting in a number of new issuances of wildfire catastrophe bonds.

The manager also expects demand long-term from new insurance markets as they adopt to evolving risks and require insurance coverage to build resilience.

Equity

The industry, utility and basic materials sectors are among the most exposed to transition risks but may also see the greatest opportunity going forward. As electric vehicles, renewables and other alternative fuels become cheaper relative to conventional alternatives, companies stand to benefit significantly from this growth. While not all participants in these growing markets are likely to be captured in today's global equity indices, many existing corporates are likely to profit significantly. Those companies that are formulating effective transition plans today and committing the required capital are among the most likely to benefit.

Beyond the low-carbon technologies already in use today, there are also many potential innovative solutions that could present opportunities. These include carbon capture and storage, direct air capture, low- or zero-carbon hydrogen and ammonia production and nature-based solutions.

Yet volume growth and investment returns are not intrinsically correlated. Thematic focus on constraints will be required to protect returns. Investors should focus on three areas to evaluate opportunities and produce targeted investment strategies: geological scarcity, technological innovation and regulatory change.

Fixed Income

Government and currency opportunities

Governments are increasingly looking to issue “green” versions of their debt. Often green bonds trade at a premium to their counterparts and can offer attractive relative value opportunities in addition to the non-financial benefits that may be attractive to investors.

Corporate bonds

Much of the new issuance within the corporate bond market is likely to have an ESG bias to it over the coming years, with particular attention towards issuers potentially exposed to material climate risks. The Bond Plus Manager is well placed to understand the materiality of these risks and as such, can understand the market’s pricing of these risks and determine where they see climate related opportunities in the future.

Asset-backed securities

The climate related opportunities in the ABS asset class are the range of new green ABS bonds that are coming on the market.

Appendix – climate scenario modelling assumptions

The purpose of the scenario model is to consider the long-term exposure of the Group to climate related risks and the pattern of asset returns over the long term.

In particular, the model considers different climate change scenarios and the approximate impact on asset/liability values over the long term.

The model assumes a deterministic projection of assets and low dependency liabilities, using standard actuarial techniques to discount and project expected cashflows.

- i. It models the full yield curve as this allows for an accurate treatment of the liabilities and realistic modelling of the future distribution of interest rates and inflation. It also allows us to truly assess the sensitivities of the assets and liabilities to changes in interest and inflation rates.
- ii. The parameters in the model vary deterministically with the different scenarios.
- iii. Note no allowance is made for expenses, with modelled asset/liability cashflows left unaffected by these factors.

The liability update and projections are considered appropriate for the analysis. However, they are approximate and a full actuarial valuation carried out at the same date may produce a materially different result. The liability update and projections are not formal actuarial advice and do not contain all the information you need to make a decision on the contributions payable or investment strategy.

The model intends to illustrate the climate-related risks to which the Group is currently exposed, highlighting areas where risk mitigation could be achieved through changing the portfolio allocation.

Other relevant issues such as governance, costs and implementation (including manager selection and due diligence) must be considered when making changes to the investment strategy.

Investment risk is only captured in the deviance from the base case, but this is not the only risk that the Group faces. Other risks include covenant risk, longevity risk, timing of member options, basis risks and operational risks.

The model has been set up to capture recent market conditions and views. The model may propose different solutions for the same strategy under different market conditions.

Key Assumptions

	Temperature risk by 2100	Reach net zero by	Carbon price (2030/2050)	Introduction of environmental regulation
No transition	+4C	After 2050	\$40/\$50	None
Disorderly transition	<3C	After 2050	\$65/\$340	Late and aggressive
Abrupt transition	1.5C – 2C	2050	\$135/\$280	Aggressive
Orderly transition	1.3C – 2C	2050	\$100/\$215	Co-ordinated
Smooth transition	<1.5C	2045	\$80/\$165	High co-ordination

Source: Aon.







Appendix – GHG emissions in more detail

GHGs are vital because they act like a blanket around the Earth making it the climate habitable. The problem is that human activity is making the blanket "thicker". For example, when we burn coal, oil, and natural gas we send huge amounts of carbon dioxide into the air. When we destroy forests, the carbon stored in the trees escapes to the atmosphere. Other basic activities, such as raising cattle and planting rice, emit methane, nitrous oxide, and other GHGs.

The amount of GHGs in the atmosphere has significantly increased since the Industrial Revolution. The Kyoto Protocol¹⁵ identifies six GHGs which human activity is largely responsible for emitting. Of these six gases, human-made carbon dioxide is the biggest contributor to global warming.

Each GHG has a different global warming potential and persists for a different length of time in the atmosphere. Therefore, emissions are expressed as a carbon dioxide equivalent (CO₂e). This enables the different GHGs to be compared on a like-for-like bases, relative to one unit of carbon dioxide.

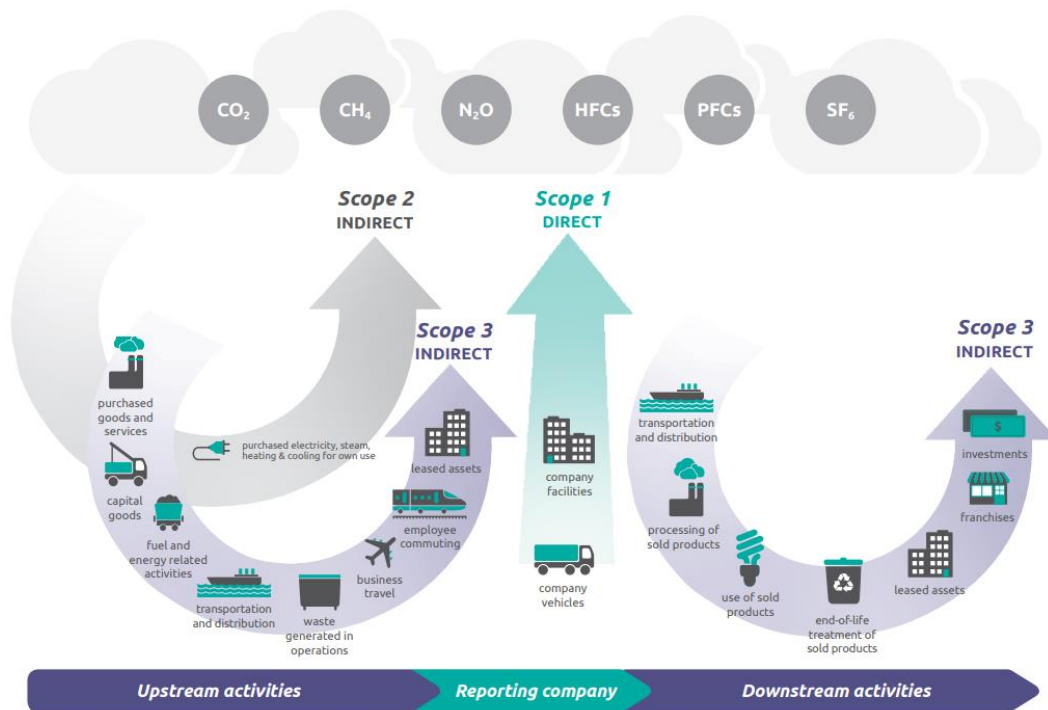
Six main greenhouse gases identified by the Kyoto Protocol

					
Carbon dioxide	Methane	Nitrous oxide	Hydro-fluorocarbons	Per-fluorocarbons	Sulphur hexafluoride
CO ₂	CH ₄	N ₂ O	HFCs	PFCs	SF ₆

¹⁵ https://unfccc.int/kyoto_protocol

GHGs are categorised into three types or ‘scopes’ by the GHG Protocol, the world’s most used GHG accounting standard.

An overview of GHG Protocol scopes and emissions across the value chain is as follows:



Source: GHG Protocol, [Corporate value chain \(scope 3\) Accounting and Reporting Standard](#), 2011