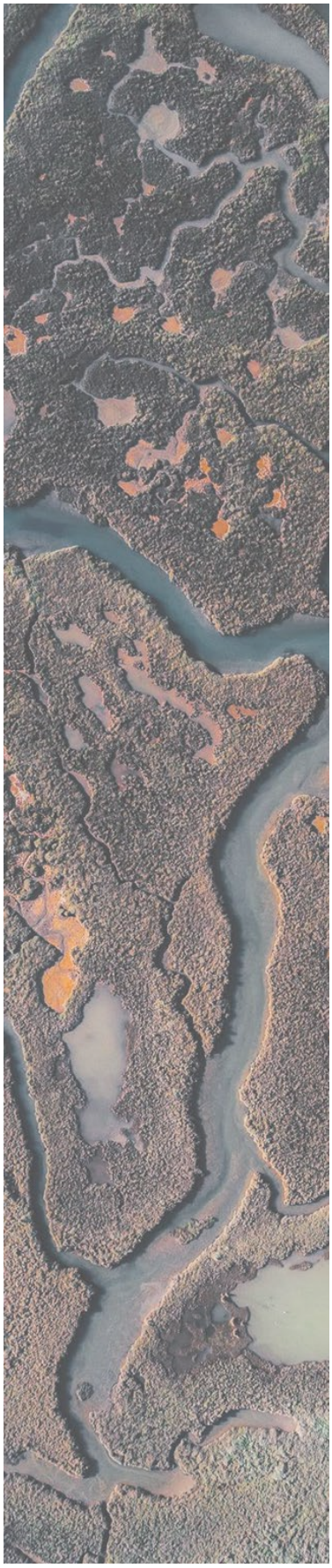
Climate disclosures for the year ended 31 December 2024

Produced by: The Trustee of the MSD Pension Scheme

Date: March 2025

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 MSD Pension Scheme's vulnerability to climate-related risks will help us to mitigate the risks and take advantage of any opportunities.

UK regulations require trustees of pension schemes with more than £1bn in assets at the end of their first scheme year ending after 1 March 2021, to meet certain climate governance requirements and publish an annual report on their scheme's climate-related risks. The MSD Pension Scheme had over £1bn in assets as at 31 December 2021. The Trustee is therefore required to report on its climate-related risks. The MSD Animal Health Pension Scheme had less than £1bn in assets as at 31 December 2021 and so it is not in scope for reporting.

Better climate reporting should lead to better-informed decision-making on climate-related risks. And on top of that, greater transparency around climate-related risks should increase accountability and provide decision-useful information to investors and beneficiaries.

This report is the annual climate disclosures for the MSD Pension Scheme (the "Scheme") for the year ended 31 December 2024. This report has been prepared by the Trustee of the MSD Pension Scheme (the "Trustee") in accordance with the regulations set out under The Occupational Pension Schemes (Climate Change Governance and Reporting) Regulations 2021 (the "Regulations") and is aligned to the Taskforce for Climate-related Financial Disclosures ("TCFD") framework.

The four elements covered in the report are:

Governance:	The Scheme's governance around climate-related risks and opportunities.
Strategy:	The potential impacts of climate-related risks and opportunities on the Scheme's strategy and financial planning.
Risk Management:	The processes used to identify, assess and manage climate-related risks.
Metrics and Targets:	The metrics and targets used to assess and manage relevant climate-related risks and opportunities.

Table of contents

Executive summary

This report sets out the actions that we, the Trustee, have taken to understand the potential impact climate change could have on the Scheme.

We have worked closely with our investment adviser to identify the climate-related risks and opportunities faced by the Scheme, and to understand ways we can manage and mitigate those risks.

Overview of the Scheme

The Scheme is a Defined Benefit (DB) Scheme with an asset portfolio of c.£752M at 31 December 2024.

The Scheme invests in a range of asset classes which includes equities, liability driven investments ("LDI") and bulk annuities. Within this report we consider the potential impact of climate-related risks on those asset classes, the investment strategy and the funding of the Scheme.

Governance

We, the Trustee, are responsible for overseeing all strategic matters related to the Scheme. This includes the governance and management frameworks relating to environmental, social and governance ("ESG") considerations, and climate-related risks and opportunities.

We delegate oversight of the Scheme's climate change risk management approach to the Funding and Investment Sub-Committee ("FISC") where it relates to funding and investment matters.

Strategy

Our qualitative analysis of climate related risks and opportunities showed that the asset classes in which the Scheme invests are all impacted by climate-related risks to some degree. Over time the risk exposure is expected to increase. Diversification across asset classes, sectors and regions is important to manage climate-related risks for the Scheme.

We also identified investment opportunities for the different asset classes.

We undertook climate scenario analysis which showed the Scheme has a reasonable degree of resilience to climate-related risks. This is due to the high level of hedging the Scheme has but the equity allocation remains a risk in the short- and medium-term.

Risk Management

We established a process to identify, assess and manage the climate-related risks and opportunities the Scheme is exposed to. Climate risk management is integrated into the Scheme's ongoing risk management activities of the Scheme through the risk register and our climate risk management framework.

Our climate risk management framework (set out on pages 20-24, helps us with the ongoing management of climate related risks and opportunities. Alongside this, we undertake periodic

training on responsible investment to understand how ESG factors, including climate change, may impact the Scheme's assets and liabilities. Details of training the Trustee has undertaken through the Scheme's year are included in the *Governance* section and *Risk Management* section of the report.

Metrics and Targets

Metrics

We have disclosed information for the Scheme on four climate-related metrics:

- Total Greenhouse Gas (GHG) Emissions.
- Carbon Footprint.
- Data Coverage.
- Binary Target Measurement

Overall, the total scopes 1 and 2 emissions for equities reduced by a small amount compared to last year. The total scopes 1 and 2 emissions for the bulk annuity remained broadly similar to last year however, there has been a material improvement in data coverage and the carbon footprint is much lower. We also reported on scope 3 emissions for the equities for the first time.

Target

Last year we set a target to reduce the carbon footprint of the equity investments by 7% year-on-year using 31 December 2021 as the starting point for measurement.

Since 31 December 2021, the equity carbon footprint has fallen by 20% p.a.which is ahead of target.

We reviewed the metrics and target and we believe they remain appropriate.

To tackle the Scheme's climate-related risks and to help reach our target, we have decided to take the following actions:

- Engage with the Scheme's equity manager to understand what progress can be made with regards to decreasing the equity carbon footprint. This could be done through encouraging the equity manager to consider underlying investments; selecting lower emitting companies and/or encouraging companies to decrease their carbon footprints.
- Monitor the carbon footprint of our equities. If the carbon footprint does not improve over time, we will consider the ongoing suitability of our investment in the fund. We may consider other investments with lower emissions or using carbon offsets to compensate for emissions.

We hope you enjoy reading this report and understanding more about how we are managing climate-related risks and opportunities within the Scheme.

Signed by:
2702605735104CC...
on behalf of the Trustee of the MSD Pension Scheme.

Governance

Governance is the way the Scheme operates, 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. This includes us, as the Trustee, and others making Scheme-wide decisions, such as those relating to the investment strategy or how it is implemented, funding, the ability of the sponsoring employer to support the Scheme.

Our Scheme's governance

As the Trustee of the Scheme, we are responsible for overseeing all strategic matters related to the Scheme. This includes the governance and management frameworks relating to environmental, social and governance ("ESG") considerations and climate-related risks and opportunities.

We agreed our climate-related beliefs and our approach to managing climate change risk. These are set out in the Scheme's Statement of Investment Principles ("SIP"), which is reviewed at least triennially by the Trustee. The latest SIP can be found online here.

Our climate beliefs

We believe that the risk of environmental, social and governance factors, including climate change, can negatively impact the value of investments held if not understood and evaluated properly. In particular, rising global temperatures, in aggregate, represent severe societal and ecological threats. The mitigation of these risks, where they are relevant to the Scheme, is important to preserving and enhancing retirement outcomes for the Scheme's members.

Climate-related factors may create investment opportunities. We will seek to selectively capture such opportunities through our investment portfolio where it is appropriately aligned with our strategic objectives and fiduciary duty.

We will consider climate-related commitments made by Merck, Sharp & Dohme (UK) Limited (the "Company") in setting targets for the Scheme.

We will keep members informed of the Scheme's activities and the impact on the Scheme's investments.

If climate-related factors are not being incorporated to our satisfaction, we may consider selecting an alternative asset manager.

Climate-related risks and opportunities are integrated into our risk management framework so we can maintain oversight of the climate-related risks and opportunities that are relevant to the Scheme.

We receive training on an annual basis (or more frequently if required) on climate-related issues to ensure that we have the appropriate knowledge and understanding to support good decision-making.

We delegate oversight of the Scheme's climate change risk management approach to the Funding and Investment Sub-Committee ("FISC") where it relates to funding and investment matters. The FISC is a sub-committee of the Trustee and keeps the Trustee updated on material climate-related developments on a regular basis (at least annually).

Role of the FISC

The key activities undertaken by the FISC, with support of our advisers, are:

- Ensure investment strategy or implementation proposals consider the impact of climate risks and opportunities.
- Seek investment opportunities which enhance the security of member benefit payments and, where possible, the ESG and climate change focus of the asset portfolio.
- Engage with the Scheme's investment managers to understand how climate risks are considered in their investment approach, whilst recognising that the investment managers have delegated powers to invest in a manner consistent with their own strategy's investment objectives.
- Work with the investment managers to disclose, actively monitor and set targets on relevant climate-related metrics as set out in the TCFD recommendations.
- Ensure that stewardship activities are being undertaken appropriately by the investment managers on the Scheme's behalf.
- Ensure that funding and covenant advice adequately incorporate climate-related risk factors where they are relevant and material.

The FISC meet regularly to carry out the above activities. The FISC is supported by the Scheme's investment adviser, Aon, in carrying these out, through Aon's wider engagement with the investment management industry on behalf of all its clients. The FISC keep the Trustee updated on any material climate-related developments through regular (at least annual) updates.

Trustee update

Over the year, the FISC received training on the observations made by the Pensions Regulator in its second review of TCFD reporting within the industry. This included guidance on climate-related covenant assessment.

The purpose of these training sessions was to better equip us ahead of the preparation of the Scheme's third TCFD report.

How we work with our advisers

We expect our advisers and investment managers to bring important climate-related issues and developments to our attention in a timely manner. We expect our advisers and investment managers to have the appropriate knowledge on climate-related matters.

We regularly review the quality of our advisers' provision of advice and support on climate-related issues. For our investment adviser this is part of the annual review of investment consultant objectives.

Investment consultant – our investment consultant, Aon, provides investment related strategic and practical support to the FISC and the Trustee in respect of the management of climate-related risks and opportunities. We have noted Aon's qualifications and expertise in this area through their participation in cross-industry initiatives such as the Investment Consultants'

Trustee update

Over the year, we worked closely with our investment consultant to publish our third TCFD report. We recently assessed our investment consultant, Aon, against its climate-related objectives and concluded that Aon had met our expectations.

Sustainability Working Group (ICSWG) and Cambridge Institute for Sustainability Leadership (CISL).

Aon's support includes provision of regular training and updates on climate-related issues, climate change scenario modelling, and ESG ratings for the Scheme's investments.

Scheme Actuary - the Scheme Actuary, Mr R Moring, FIA, helps the Trustee assess the potential impact of climate-related risks on the Scheme's funding assumptions where appropriate.

Covenant adviser - the Trustee's covenant adviser, Cardano, helps the Trustee understand the potential impact of climate change risk on the sponsor covenant.

Strategy

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

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

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

We carried out a qualitative risks and opportunities assessment of the asset classes the Scheme is invested in. From this we identified which climate-related risks could have a material impact on the Scheme. We also identified suitable climate-related opportunities.

To help us with our assessment, we surveyed our investment managers and insurer asking them to rate the climate-related risks and opportunities they believe their investments are exposed to. Both the investment managers and the Scheme's insurer provided responses.

Our investments

The Scheme's investment portfolio is diversified across a range of different asset classes including equities, LDI and annuities.

The Scheme's asset allocation as at 31 December 2024 is as follows:

Asset Class	LDI	Equities	Bulk Annuity
Strategic Allocation	42%	34%	24%

Source: Providers. Figures may not sum due to rounding.

How the qualitative risk assessment works

Risk categories

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

More details about transition and physical risks can be found in the *Appendix*.

Ratings

The analysis uses a RAG rating system where:

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

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

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

Time horizons

We assessed the climate-related risks and opportunities over multiple time horizons considering the liabilities of the Scheme and its obligations to pay benefits. We decided the most appropriate time horizons for the Scheme are:

- Short-term: 1-3 years
- Medium-term: 4-10 years
- Long-term: 11-30 years

Data availability

Both the Scheme's investment managers and the insurer were able to provide climate-related risks and opportunities information about their investments. Currently, the Scheme's insurer does not publicly disclose a red/amber/green rating of climate-related risks for the assets backing the bulk annuity but it is continuing to enhance its disclosures and will share more information for future reporting.

Qualitative assessment

Climate-related risks

Key conclusions

LDI

The Scheme's LDI manager classified the risks as low for all time horizons.

Equities

In the short-term, equities are broadly rated low risk for transition risks due to the current pace of global policy change. Over the year, the manager believes that the short-term reputational risk rating has decreased from medium (amber) to low (green) as it now believes such risks will only materialise in the long term.

The risk rating broadly rises to medium (amber) in the medium-term for both physical and transition risks. Over the year, the manager believes the medium-term regulatory risk rating has increased from medium (amber) to high (red) as it believes that momentum for significant climate related policies could increase and lead to volatility in business environments.

In the long term, transition risks are expected be high. Market risks will be high due to a mismatch of demand and supply for key raw materials. Regulatory risks will be high as carbon prices are expected to rise impacting equity valuations and causing companies to default.

Bulk annuities

In terms of physical risks, the Scheme's insurer has identified acute and chronic risks in the long term. In terms of transition risks, the Scheme's insurer has identified market and reputation risks in the short term and policy/legal and market risk in the medium term only.

The following tables summarise the transition and physical risks for each asset class the Scheme is invested in. Each table is based on ratings and commentary provided by the managers.

LDI – 42% of portfolio as at 31 December 2024

Physical risks

	Acute	Chronic
Short	G	G
Medium	G	G
Long	G	G

The Scheme's LDI manager rated the risks for the LDI mandate to be low (green) over all periods based on its climate-change scenario analysis.

Transitional risks

	Regulatory	Technology	Market	Reputation
Short	G	G	G	N/A
Medium	G	G	G	N/A
Long	G	G	G	N/A

The Scheme's LDI manager rated the risks for the LDI mandate to be low (green) over all periods based on its climate-change scenario analysis. Reputation risk is currently not modelled as part of the manager's climate-change scenario analysis.

Source: Manager

Equities – 34% of portfolio as at 31 December 2024

Physical risks

	Acute	Chronic
Short	G	G
Medium	A	G
Long	A	A

In the medium- and long-term, the manager believes that acute physical risk exposure is expected to increase. Acute physical risks like extreme weather are expected to become more frequent, severe, and

Transitional risks

	Regulatory	Technology	Market	Reputation
Short	A	G	G	G
Medium	R	A	A	A
Long	R	A	R	A

Two main differences can be observed since last year's analysis. The equities manager decreased the short-term reputational risk rating from medium (amber) to low (green). This is because the manager now believes that such risks will

unpredictable. This will affect asset valuations across the globe.

In the long-term, the manager believes that chronic physical risks such as changes to weather patterns and rising sea levels are likely to affect companies' profitability and countries' economic output through impacts on labour productivity and supply.

materialise only in the longer term as it believes the market is not currently pricing in climate risk. The manager also increased the medium-term regulatory (policy and legal) risk from medium (amber) to high (red) as it believes this risk is the most prevalent for equities, as the momentum for significant climate related policies could increase and lead to volatility in business environments.

The manager believes that the medium-term is a crucial period for the climate transition as time is running out for limiting global warming to well-below 2ºC. As a result, the manager believes that polices will further accelerate putting at risk equity values and profit margins.

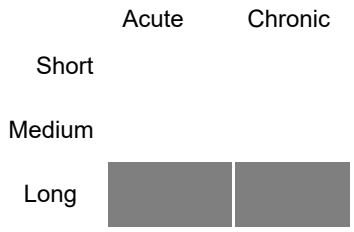
In the long-term, the manager rated the regulatory risk exposure high (red). It believes that for emissions to stay within global budgets carbon prices will continue to rise, considerably impacting equity valuations and causing companies to default. The manager also believes that there will be market risks in the long term due to a mismatch of demand and supply for key raw materials. For example, critical minerals feeding into low-carbon technologies, such as renewables and electric vehicle batteries, need to scale up supply to meet the potentially explosive growth in demand.

Source: Manager

Bulk annuities – 24% of portfolio as at 31 December 2024

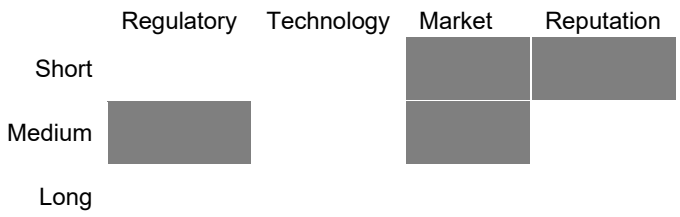
The insurer does not currently publicly disclose a red/amber/green classification and therefore has not provided this level of detail. Shaded cells represent exposure to risks in each category and the relevant time horizons. The insurer is continuing to enhance its disclosures and will share more information in future.

Physical risks



In the long-term, the insurer believes that both acute and chronic physical risks are present due to increased impacts and threats from flooding and coastal erosion. For residential and commercial mortgages, the borrower's ability to service and repay the loan could be affected by increased costs due to physical risks, especially for real estate assets.

Transitional risks



In the short-term, the insurer has identified market and reputational risks. The insurer believes that green investments become difficult to source or produce lower yields which could lead to a balance sheet loss and an inability to meet responsible investment framework aims while meeting investment return needs.

In the medium-term, the insurer has identified reputational risks if it is unable to meet its interim 50% reduction in emissions across its investments. The insurer is aligning closely with external initiatives/guidance as well as engaging with supply chains to reduce emissions and avoid such a scenario.

In the medium-term the insurer believes that more stringent energy performance standards on commercial and residential property may cause values to fall below the level of the loan, leading to losses.

Source: Insurer

Climate-related opportunities

We have identified some climate-related opportunities which may be suitable for the Scheme across the short-, medium- and long-term:

Cleaner energy

Electric vehicles, renewables and other alternative fuels

Investment

Green bonds and gilts

Innovative solutions

Carbon capture and storage, direct air capture, low or zero carbon hydrogen production, nature-based solutions

Environmental front runners

Formulating effective transition plans today

Promote change

Engagement with policy makers and market initiatives. Improve energy performance certificates in properties of lifetime mortgages portfolio.

Technology

Emerging technology and innovation

Source: Providers

How resilient is the Scheme to climate change?

Previously, we carried out climate change scenario analysis to better understand the impact climate change could have on the Scheme's assets and liabilities.

The analysis considers a range of climate change scenarios. Each climate scenario considers what may happen to the Scheme when transitioning to a low carbon economy under different temperature-related environmental conditions. These scenarios were developed by Aon and are based on detailed assumptions. They are only illustrative and subject to considerable uncertainty.

The climate scenarios are intended to illustrate the climate-related risks the Scheme is currently exposed to, highlighting areas where risk mitigation could be achieved through changing the investment portfolio.

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 captured in the deviance from the Base Case, but this is not the only risk that the Scheme faces. Other risks include covenant risk, longevity risk, timing of member options, and operational risks.

Trustee update

Under the regulations, scenario analysis must be carried out every 3 years, or sooner if there have been significant changes which could impact the Scheme. We reviewed the scenario analysis carried out previously and concluded it is still relevant.

Since the analysis was carried out the Scheme divested from an emerging markets equity fund. It was a relatively small investment which we do not expect to materially change the results of the analysis.

There have been no other material changes to the modelling techniques, policy implementation to tackle climate change or asset data availability.

Key conclusions

We have not updated the climate scenario analysis because we believe it remains appropriate as there have been no significant changes that would materially impact the results.

Based on the scenario analysis, we believe the current levels of climate-related risks are not yet material to the resilience of the Scheme's funding and investment strategies. We are not planning to make any changes to the investment strategy because of this analysis.

The climate scenarios we chose to analyse are set out in the table below.

Scenario	Reach net zero by…	Degree warming vs pre-industrial levels by 2100	Introduction of environmental regulation	Scenario description
Base Case	2050	+2ºC – 2.5ºC	Fragmented Policy Coordination	Emission reductions start now and continue in a measured way in line with the objectives of the Paris Agreement and the UK government's legally binding commitment to reduce emissions in the UK to net zero by 2050
Disorderly Transition	After 2050	<3ºC	Late and Aggressive	Limited action is taken and insufficient consideration is given to sustainable long-term policies to manage global warming effectively
Orderly Transition	2050	1.3ºC – 2ºC	Coordinated	Immediate and coordinated action to tackle climate change is taken using carbon taxes and environmental regulation
Abrupt Transition	2050	1.5ºC – 2ºC	Aggressive	Action on climate change is delayed for five years at which point we experience more frequent extreme weather events and governments must address GHG emissions

Source: Aon.

Impact on the funding level

Key conclusions

Overall, we are comfortable with the level of resilience exhibited by the investment portfolio, and we are not going to make any changes to the investment strategy because of this analysis.

The Scheme shows a reasonable level of resilience to climate-related risks. This is due to the high level of interest rate and inflation hedging the Scheme has but the equity allocation remains a risk in the short- and medium- term.

The Disorderly transition scenario is the worst outcome for the Scheme at the end of the 30-year modelling period. Initially the funding level improves in line with the base case, but after 10 years the funding level deteriorates sharply and does not recover by the end of the 30-year modelling period. This leaves the Scheme materially worse relative to the base case.

Another key risk is volatility of the funding level. Under the Orderly transition and Abrupt transition scenarios, the Scheme experiences sudden falls in the funding level before recovering. Deterioration of the funding level will place a strain on the employer covenant as the Company may have to make up a funding deficit through contributions. It may also require the Scheme to re-risk to stay on track to achieve the funding target or extend the timeframe for achieving this.

Climate scenarios in more detail

The table below describes the impact of each scenario on the Scheme over the short-, medium- and long-term time horizons.

	Summary of the Scenario	Summary of the impact to the Scheme
Disorderly Scenario Temperature rise <3°C Reach net-zero After 2050 Environmental regulation Late and Aggressive	**In the short term:** Insufficient consideration given to long-term policies and there is no action taken to combat climate change. **In the medium term:** Late but coordinated action is taken to tackle climate change. The late timing means it is less effective and more costly to implement. Adverse impacts from climate change leads to a drag on risk assets. **In the long term:** After the costly implementation to tackle climate change and the resulting drag on risky assets, the transition to clean technologies and green regulation begins to boost economic growth when considering the very long term. However, the late and disorderly climate transition means that physical climate risks remain prominent over the very long term.	**In the short term:** There is no impact on the Scheme's funding level, as it is expected to follow the base case. **In the medium term:** Although initially, the funding level improves in line with the base case, after 10 years, the funding level deteriorates sharply by c.20%. **In the long term:** The funding level does not recover by the end of the 30-year modelling period, this leaves the Scheme worse off in terms of surplus relative to the base case. This is the worst case for the Scheme.

	Summary of the Scenario	Summary of the impact to the Scheme
Orderly Scenario Temperature rise 1.3°C – 2°C Reach net-zero 2050 Environmental regulation Coordinated	**In the short term:** Immediate coordinated global action is taken to tackle climate change. Risky assets perform poorly. **In the medium term:** The rapid transition to clean technologies and green regulation begins to boost economic growth. **In the long term:** The rapid transition to clean technologies and green regulation begins to boost economic growth. This represents the fastest transition to a green economy, combined with limited physical impacts from climate change despite the large initial transition cost.	**In the short term:** The Scheme sees volatility in its funding level as it experiences sudden falls, c.10%, in the funding level before recovering in the medium-term. This may place a strain on the sponsoring employer should it be required to make up any funding shortfall with additional contributions. **In the medium term:** The funding position recovers and then follows a similar trajectory as the base case. **In the long term:** There is no impact on the Scheme's funding level, as it is expected to follow the base case.
Abrupt Scenario Temperature rise 1.5°C – 2°C Reach net-zero 2050 Environmental regulation Aggressive	**In the short term:** Despite growing public awareness, material action is not undertaken to combat climate change. **In the medium term:** Increasing effects of extreme weather lead to a rapid introduction of policies to tackle climate change. The delayed action leads to higher costs to tackle climate change and risky assets perform poorly as a result. The higher costs are the result for the economy being forced to transition away from fossil fuels. **In the long term:** Following rapid action in the medium term, the longer-term benefits from tackling climate change lead to higher growth.	**In the short term:** There is no impact on the Scheme's funding level, as it is expected to follow the base case. **In the medium term:** The Scheme sees volatility in its funding level as it experiences sudden falls in the funding level, c. 10%, before recovering in the longer-term. This may place a strain on the sponsoring employer should it be required to make up any funding shortfall via contributions. **In the long term:** The funding position recovers and then follows a similar trajectory as the base case.

Source: Aon. Effective date of the impact assessment is 31 December 2021
Please note: The results of the scenario modelling are illustrative and rely on many assumptions. These are subject to considerable uncertainty.

Modelling limitations

Scenario modelling relies on many assumptions and simplifications, and the projections are approximate but they are suitable for this analysis. They are only illustrative and subject to considerable uncertainty.

The climate scenarios modelling illustrates the potential impact climate change could have on the asset portfolios and liabilities. It does not consider the impact climate change could have on other risks for our clients, such as timing of member options, operational risks, and covenant risk and longevity risk.

The scenario modelling reflects market conditions and market views at the effective date of the modelling. The model may produce different results for the same strategy under different market conditions.

The modelling makes some simplifications including:

- No allowance made for the variable contributions from the Sponsoring Employer.
- No allowance was made for any potential future de-risking.

Please see *Appendix 3 – Climate scenario modelling assumptions* for more detailed information on the assumptions underpinning the scenarios.

Considering the impact of climate change on the sponsoring employer

A key risk identified from the scenario analysis is the volatility of the funding level. Under all three climate scenarios, the Scheme experiences sudden falls in the funding level before recovering. Deterioration of the funding level will place a strain on the financial strength ("covenant") of the sponsoring employer if it must make up a bigger shortfall through deficit contributions. It may also require the Scheme to re-risk its portfolio or extend the timeframe for achieving full funding or other long-term goals.

The Scheme's sponsoring employer, Merck, Sharp & Dohme (UK) Limited, adheres to the climate policies and goals of its parental organisation Merck & Co., Inc., Rahway, NJ, USA. The parental organisation climate's strategy includes a commitment to integrating sustainability at every level of its business operations.[1]

Recent accomplishments include:

- The organisation committed to a net-zero target for its greenhouse gas (GHG) emissions across our global operations (Scopes 1, 2, and 3) by 2045, aligned with the guidelines of the Science Based Targets initiatives ("SBTi").[2]
- In 2023, 88% of its purchase electricity in the UK was from renewable sources. By 2025, it will source 100% of its purchase electricity from renewables.[3]
- The organisation is actively working to reduce the CO_2e emissions associated with its company vehicles in the UK. Compared to its 2019 baseline, the average emissions of its UK running fleet have reduced by 53%. The average emissions of new company vehicles ordered in 2023 are 83% lower compared to 2019. [4]
- The organisation added sustainability metrics to its company scorecard, which directly correlates to its annual incentive plan.[5]

We monitor the covenant on a regular basis with support from our covenant adviser and maintain a regular dialogue with the sponsoring employer.

[1] See page 10 of https://www.msd.com/wp-content/uploads/sites/9/2024/08/MSD_ImpactReport_2023-2024.pdf
[2] See page 73 of https://www.msd.com/wp-content/uploads/sites/9/2024/08/MSD_ImpactReport_2023-2024.pdf
[3] See page 3 of https://www.msd-uk.com/wp-content/uploads/sites/43/2024/09/Carbon-Reduction-Plan-August-2024-signed.pdf
[4] See page 3 of https://www.msd-uk.com/wp-content/uploads/sites/43/2024/09/Carbon-Reduction-Plan-August-2024-signed.pdf
[5] See page 7 of https://www.msd.com/wp-content/uploads/sites/9/2024/08/MSD_ImpactReport_2023-2024.pdf

Risk management

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

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 for members.

Our climate risk management framework

We recognise the long-term risks posed by climate change and have taken steps to integrate climate-related risks into the Scheme's risk management processes.

We have a climate risk management framework to manage climate-related risk and opportunities. We have delegated oversight of the Scheme's climate change risk management approach to the FISC where it relates to funding and investment matters but retain the final responsibility.

The climate risk management framework set out in the tables below clearly describes who is involved, what is done and how often.

Governance

Activity	Adviser / supplier support	Frequency of review
Maintain a climate change governance framework (i.e. the Governance section of the TCFD report and this table)	Aon	Annual
Publish TCFD report and implementation statement	Aon	Annual
Add / review climate risks and activity on key Scheme documents	Aon	Ongoing
Set / review our ESG beliefs (including climate change)	Aon	Triennial
Undertaking Trustee training on climate change and climate-related risks	Aon	Ongoing
Ensure investment proposals explicitly consider the impact of climate risks and opportunities, and seek investment opportunities	Aon	Ongoing
Ensure that actuarial and covenant advice adequately incorporate climate-related risk factors where they are relevant and material	Aon / Cardano	Triennial
Review adviser objectives to ensure advisers have appropriate climate capability, and bring important, relevant and timely climate-related issues to the Trustee Board's attention	Aon / Cardano	Annual
Engage with the investment managers to understand how climate risks are considered in their investment approach, and stewardship activities are being undertaken appropriately	Aon / Investment Managers	Annual

Trustee update

The FISC monitors the above activities as part of the Scheme's ongoing management of the climate-related risks and opportunities, which includes the monitoring and reviewing of progress against the Scheme's climate risk management framework. A summary of the training we have received is set out in the Governance section within this report.

Strategy

Activity	Adviser / supplier support	Frequency of review
Identify climate-related risks and opportunities (over agreed time periods) for investment and funding strategy	Aon / Investment Managers	Annual
Scenario analysis – annual review	Aon	Annual
Actuarial valuation	Aon / Cardano	Triennial

Trustee update

The FISC spent time during the year to analyse climate-related risks and opportunities for the Scheme's asset classes. The FISC, with support from Aon, surveyed the investment managers and insurer asking them to rate the climate-related risks and opportunities they believe their investments are exposed to. All the providers gave responses, but the insurer did not provide a red/amber/green rating of climate-related risks for its assets as it does not publicly disclose this information.

The FISC also reviewed the continued appropriateness of the climate change scenario analysis carried out previously and was comfortable that the analysis remains relevant.

Risk management

Activity	Delegated responsibility	Adviser / supplier support
Identify, assess and manage key climate related risks	Aon / Investment Managers	Ongoing
Consider the prioritisation of those climate-related risks, and the management of the most significant in terms of potential loss and likelihood	Aon	Annual

Trustee update

We have processes in place for identifying and assessing climate-related risks. Climate risk management is integrated into the ongoing risk management activities of the Scheme through the risk register and this climate risk management plan.

We carry out qualitative assessment of climate risks and quantitative climate scenario analysis, which combined help us to focus on the risks that pose the most significant impact. Based on our analysis for this year's TCFD report, we do not need to make any changes to the Scheme's investment strategy.

Metrics and targets

Activity	Adviser / supplier support	Frequency of review
Agree/review approach for metrics	Aon	Annual
Agree/review target	Aon	Annual
Obtain data for agreed metrics	Aon / Investment Managers / Insurer	Annual

Trustee update

For this report we collected and reported the carbon metrics associated with the Scheme's assets. We reviewed the target set by the Scheme and we believe that it remains suitable. More details can be found in the Metrics and targets section.

Assessing our managers

To assess our managers' and our insurer's abilities to manage climate-related risks, we asked them 10 questions designed by the Pensions Climate Risk Industry Group[6]. The questions cover a range of topics including the providers' approach to climate management, whether they produce their own TCFD reporting, their ability to conduct climate scenario analysis, their engagement policies and their ability to provide GHG emissions data.

Key conclusions

We reviewed the responses from our providers and are content with them. We do not believe that any immediate action is needed.

The Scheme's managers and insurer publish their own TCFD-aligned reports. The investment managers are supporting the Scheme's climate reporting by providing emissions data. The Scheme's managers and insurer actively participate in industry initiatives such as Climate Action 100+, Institutional Investors Group on Climate Change, the Association of British Insurers and United Nations' Principles of Responsible Investment. The managers and the insurer perform climate-related risks analysis on their portfolios.

The managers and the insurer have net zero-aligned commitments. The Scheme's equity manager has committed to an interim net-zero aligned target for 70% of its AUM by 2030. The Scheme's insurer has committed to reduce its investment emissions by 50% by 2030 and to have net zero investments by 2050.

[6] Aligning your pension scheme with the Taskforce on Climate-Related Financial Disclosures recommendations - GOV.UK (www.gov.uk)

Metrics & Targets

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

Our climate-related metrics

We use some quantitative measures to help us understand and monitor the Scheme's exposure to climate-related risks.

Measuring the greenhouse gas emissions related to our assets is a key way for us to assess our exposure to climate change.

Greenhouse gases are produced by burning fossil fuels, meat and dairy farming, and some industrial processes. When greenhouse gases are released into the atmosphere, they trap heat in the atmosphere causing global warming, contributing to climate change.

Greenhouse gases are categorised into three types or 'scopes' by the Greenhouse Gas Protocol, the world's most used greenhouse gas accounting standard.

Scope 1

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

Scope 2

These are the indirect emissions from the generation of electricity purchased and used by an organisation

Scope 3

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 explanation about GHG emissions, please see the Appendix.

Our climate-related metrics – in detail

In our first year of TCFD reporting, we decided what metrics to report on annually; these are described below. This year we reviewed the metrics, and we believe they continue to be suitable for us to report against.

Total Greenhouse Gas emissions

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

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 Coverage

A measure of the proportion of the portfolio that there is 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.

Binary target measurement ("BTM")

A metric which shows how much of the Scheme's assets are aligned with a 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 portfolio investments with a declared net-zero or Paris-aligned target, or are already net-zero or Paris-aligned.

The carbon metrics

The tables below show the climate-related metrics for the Scheme's assets. The metrics are shown separately for the Liability Driven Investments ("LDI"), equities and bulk annuities because the methodology used for each are different so aggregating the metrics would not make sense.

	Allocation		Year	Data Coverage (%)		Total GHG emissions (tCO_2e)		Carbon footprint ($tCO_2e/£m$)	
Asset class	%	£M		Scopes 1&2	Scope 3	Scopes 1&2	Scope 3	Scopes 1&2	Scope 3
LDI	47%	407	2023	100%	Not Available	Physical 55,000 Synthetic 41,100	Not Available	141	Not Available
	48%	*400*	*2022*	*100%*	*Not Available*	*Physical 85,765 Synthetic 40,800*	*Not Available*	*179*	*Not Available*
Equities	26%	212	2023	97%	97%	6,500	170,300	32	826
	27%	*226*	*2022*	*96%*	*Not Available*	*8,300*	*Not Available*	*38*	*Not Available*
Bulk Annuity	25%	204	2023	96%	77%	21,100	55,100	108	349
	25%	*212*	*2022*	*70%*	*70%*	*20,000*	*86,000*	*135*	*579*

Source: Providers. Excludes cash. Figures may not sum due to rounding.
2023 data as at 31 December 2023 (Equities) and 30 June 2023 (Bulk Annuity).
2022 data as at 31 December 2022 (Equities) and 31 December 2021 (Bulk Annuity).
2023 emissions associated with LDI have been calculated using the following data:

- Physical-synthetic split as at 31 December 2023 from the LDI Manager.
- UK national emissions as at 31 December 2023 from the Emissions Database for Global Atmospheric Research (EDGAR) Community GHG Database (a collaboration between the European Commission, Joint Research Centre (JRC), the International Energy Agency (IEA), and comprising IEA-EDGAR CO2, EDGAR CH4, EDGAR N2O, EDGAR F-GASES version EDGAR_2024_GHG (2024) European Commission. EDGAR report webpage (https://edgar.jrc.ec.europa.eu/report_2024) and EDGAR_2024_GHG website (https://edgar.jrc.ec.europa.eu/dataset_ghg2024)
- PPP-adjusted GDP as at 31 December 2023 from the Organization for Economic Cooperation and Development.

The scope 3 emissions for LDI are not available because there is no industry agreed methodology for calculating scope 3 emissions for sovereign bonds.

Scopes 1 and 2 total emissions for equities reduced by a small amount compared to last year. This reflects a small reduction in the carbon footprint and a slightly smaller asset value. The equities manager provided scope 3 emissions data for the first time this year.

Scopes 1 and 2 total emissions for the bulk annuity remained broadly similar to last year. Data coverage for the bulk annuity materially improved since last year and the carbon footprint is much lower. Scope 3 total emissions for the bulk annuity have fallen since last year. Data coverage for scope 3 has slightly improved since last year and the carbon footprint is significantly lower.

The emissions associated with the LDI have fallen since last year. The carbon footprint is lower because the GHG emissions of the UK decreased in 2023 compared with 2022 whereas the PPP-adjusted GDP rose.

We will try to influence our equity manager to manage the carbon footprint of our portfolio. We have less ability to influence the emissions of the Scheme's LDI assets. This is because the main investment in LDI portfolios is UK government bonds and, unlike other asset classes, there is no choice of the underlying issuer. Similarly, the bulk annuity is an insurance contract, and so we have limited ability to influence how the insurer manages its own assets.

Binary target measurement

Asset Class	Allocation %	£M	Year	Binary target measurement
Equities	26%	212	2023	52.4%
	27%	*226*	*2022*	*50.0%*

Source: Investment Manager

The binary target measurement for equities has remained broadly the same as last year. The Scheme's binary target measurement only represents the portion of the portfolio for which there is data.

Currently, there is no standard approach for calculating binary target measurement for government bonds. Hence there is no binary target measurement for LDI. Although governments have made a commitment to net-zero emissions, in our view this cannot be reasonably extended to apply to its bonds.

The insurer did not provide binary target measurement data.

Notes on the metrics data

Our investment adviser, Aon, collected information from the Scheme's investment managers about their greenhouse gas emissions. Aon collated this information to calculate the climate-related metrics for the Scheme's portfolio of assets.

Availability of data

- The LDI manager provided data for scopes 1 and 2 emissions only as the methodology for scope 3 emissions associated with government bonds has not yet been established.
- The data for the Scheme's insurer relates to investments in credit and lifetime mortgages. Data has been provided as at 30 June 2023.

Aon does not make any estimates for missing data.

Due to data coverage not being 100% across asset classes, the reported emissions metrics do not include all the Scheme's GHG emissions. And so, the metrics show the Scheme's GHG emissions to be lower than they really are. We expect that in the future better information will be available from managers and this improvement will be reflected in the coming years' reporting.

How we collected the data

Our investment adviser, Aon, collected the carbon emissions data from our managers on our behalf using the industry standard CET Template. The CET was developed by a joint industry initiative of the Pension and Life Savings Association, the Association of British Insurers and Investment Association Working Group. The CET provides a standardised set of data to help pension schemes meet their obligations under the Climate Change Governance and Reporting Regulations, and associated DWP Statutory Guidance.

Notes on the metrics calculations

We use the industry standard methodology for calculating metrics where available. There currently is no industry-wide standard for calculating the metrics for some assets yet and different managers may use different methods and assumptions. These issues are common across the industry and highlight the importance of climate reporting to improve transparency. We expect that in the future better information will be available from managers as the industry aligns to expectations and best practice standards.

The carbon metrics

Aon calculated the carbon metrics for the Scheme based on the information provided by the managers. Where possible, Aon used the unaltered data provided by the managers. The table overleaf shows the broad approach used for calculating each metric.

Asset class	Approach
LDI	There is currently no industry agreed standard for calculating LDI emissions. Aon calculates LDI carbon footprint to ensure consistency across managers and reporting. The carbon footprint was calculated using UK GHG Emissions and PPP adjusted GDP and assumes data coverage to be 100%. Aon collected the physical and synthetic split from the Scheme's LDI manager. The 2023 emissions associated with LDI has been calculated from the following sources: • Physical-synthetic split as at 31 December 2023 from LDI manager • UK national emissions as at 31 December 2023 from the Emissions Database for Global Atmospheric Research. • PPP-adjusted GDP as at 31 December 2023 from Organization for Economic Cooperation and Development. PPP-adjusted GDP is calculated by dividing the GDP by the corresponding purchasing power parity (PPP) which removes the price level differences between countries.
Equity	**Carbon footprint** The carbon footprint was provided by the manager in tCO2e/£GBPM. The carbon footprint has been calculated based on an Enterprise Value Including Cash ("EVIC") allocation. **Total GHG emissions** Using the carbon footprint, Aon calculated the Scheme's emissions as follows: *carbon footprint × £M Scheme assets invested in the fund × data coverage*
Bulk annuity	The insurer provided carbon emissions data relating to its liquid bond portfolio and lifetime mortgage portfolio which backs the bulk annuity as at 30 June 2023. The carbon emissions for the bulk annuity may increase or decrease in future as the insurer increases its data coverage of its assets. **Carbon footprint** The carbon footprint was provided by the insurer in tCO2e/$USDM as at 30 June 2023. Aon converted this figure into GBP using the 30 June 2023 exchange rate. **Total GHG emissions** Using the carbon footprint, Aon calculated the Scheme's emissions as follows: *carbon footprint × £M Scheme assets invested in the fund × data coverage*

Looking to the future
Our climate-related target

Climate-related targets help us track our efforts to manage the Scheme's climate change risk exposure.

We recognise that we have limited ability to influence the emissions of the LDI and bulk annuity assets held by the Scheme. As such, our target only covers our equity investments where we can focus on having a greater influence.

Our progress towards the target

Last year, we set a target to reduce the carbon footprint of our equity investments. The Scheme's performance against the target is measured and reported on every year. Over time, this will show the Scheme's progress against the target.

Target

7%
reduction
of equity carbon footprint year-on-year

Measured on an annualised basis. Using 31 December 2021 as the starting point for measurement.

Reported carbon footprint
(tCO_2e/£M invested)

2021	2022	2023
50	38	32
		▼ 20% p.a. reduction

Since 31 December 2021, the equity carbon footprint has fallen by 20% p.a.. This is ahead of target.

The target measures progress against the 31 December 2021 baseline. Since this date, we disinvested from an Emerging Markets Fund and a World Equity Index Fund which will have reduced the carbon footprint as these two funds are relatively carbon intensive. On the other hand, the only remaining fund within the equity portfolio, having an ESG tilt, has continued to deliver material reductions in the carbon footprint. As a result, the Scheme is substantially ahead of target. We are cautious about the conclusions we can draw from this though. We expect that over time improvements will slow down as it becomes more challenging to deliver carbon footprint reductions.

How to reach our target

We will endeavour to meet the target, being mindful of it when considering the Scheme's investment strategy and the funding objectives. To keep reaching our target, we plan to:

Why we chose to focus on equity emissions

We decided to focus on the emissions from equities because this is where we can make the most impact. We have less ability to influence the emissions of the Scheme's LDI assets. This is because the main investment in LDI portfolios is UK government bonds and, unlike other asset classes, there is no choice of the underlying issuer.

Similarly, the bulk annuity is an insurance contract, and so we have limited ability to influence how the insurer manages its own assets.

Trustee update

Each year we review the suitability of the target we have set. Based on the data collected and the metrics calculated this year, we believe the target continues to be suitable.

1. Engage with the Scheme's equity manager to understand what progress can be made with regards to decreasing the equity carbon footprint. This could be done through encouraging the equity manager to consider underlying investments; selecting lower emitting companies and/or encouraging companies to decrease their carbon footprints.

- Monitor the carbon footprint of our equities. If the carbon footprint does not improve over time, we will consider the ongoing suitability of our investment in the fund. We may consider other investments with lower emissions or using carbon offsets to compensate for emissions.

Appendices

Please see the appendices for additional information about our climate disclosures report.

Appendix 1 – Glossary

Governance	refers to the system by which an organisation is directed and controlled in the interests of shareholders and other stakeholders.[7] 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.[8]
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.[9]
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.[10]
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.[11]
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.[12]
Value chain	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).[13]
Net zero	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.[14]

[7] A. Cadbury, Report of the Committee on the Financial Aspects of Corporate Governance, London, 1992.

[8] OECD, G20/OECD Principles of Corporate Governance, OECD Publishing, Paris, 2015.

[9] TCFD, Recommendations of the Task Force on Climate-related Financial Disclosures, 2017

[10] TCFD, Recommendations of the Task Force on Climate-related Financial Disclosures, 2017

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

[12] TCFD, Recommendations of the Task Force on Climate-related Financial Disclosures, 2017

[13] TCFD, Recommendations of the Task Force on Climate-related Financial Disclosures, 2017

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

Appendix 2 – An explanation of climate risk categories

Climate-related risks are categorised into physical and transition risks. Below are examples of transition and physical risks.

Transition risks

Transition risks are those related to the ability of an organisation to adapt to the changes required to reduce greenhouse gas 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

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

Technology

Examples

Cost to transition to lower emissions technology
Unsuccessful investments in new technologies

Potential financial impacts

Write-offs and early retirement of existing assets
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.
Abrupt and unexpected increases in energy costs.
Re-pricing of assets (e.g., fossil fuel reserves, land valuations, securities valuations).

Reputational

Examples

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

Physical Risks

Physical risks refer to the physical impacts of climate change on a firm's operations. They directly impact a firm's ability to perform its function due to climate disruption. They fall into two subcategories: acute and chronic. Acute risks are extreme climate events, and chronic risks are trends that appear over time.

Acute

Examples

Extreme heat
Extreme rainfall
Floods
Droughts

Chronic

Examples

Water stress
Sea level rises
Land degradation
Variability in temperature

Appendix 3 – Climate scenario modelling assumptions

The climate scenarios were developed by Aon and are based on detailed assumptions. They are only illustrative and are subject to considerable uncertainty. They consider the exposure of the Scheme to climate-related risks and the approximate impact on asset and liability values over the long-term.

Aon's model uses a deterministic projection of assets and long-term funding target liabilities, using standard actuarial techniques to discount and project expected cashflows.

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.

The parameters in the model vary deterministically with the different scenarios.

No allowance was made for:

- The variable contributions of up to £15M p.a. potentially payable until March 2026.
- The expenses for this basis are not paid by the Scheme, therefore not allowed for within the projection.
- The modelling does not allow for any potential future de-risking.

The liability 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 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 the Scheme is currently exposed to, 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 Scheme 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.

Data used

The model projects using the following inputs as at 31 December 2021:

- Market value of assets: £1,579m
- Present value of Long-term funding target liabilities: £1,670m
- Contributions: None allowed for with the projection.

Scenario key assumptions

	Temperature risk by 2100	**Reach net zero by**	**Carbon price (2030/2050)**	**Introduction of environmental regulation**
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	Coordinated

Appendix 4 – Greenhouse gas emissions in more detail

Greenhouse gases 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 greenhouse gases to the atmosphere makes it even more effective at preventing heat from leaving the Earth's atmosphere.

Greenhouse gases 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 greenhouse gases.

The amount of greenhouse gases in the atmosphere has significantly increased since the Industrial Revolution. The Kyoto Protocol[15] identifies six greenhouse gases which human activity is largely responsible for emitting. Of these six gases, human-made carbon dioxide is the biggest contributor to global warming.

Each greenhouse gas 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 (CO_2e). This enables the different gases to be compared on a like-for-like bases, relative to one unit of carbon dioxide.

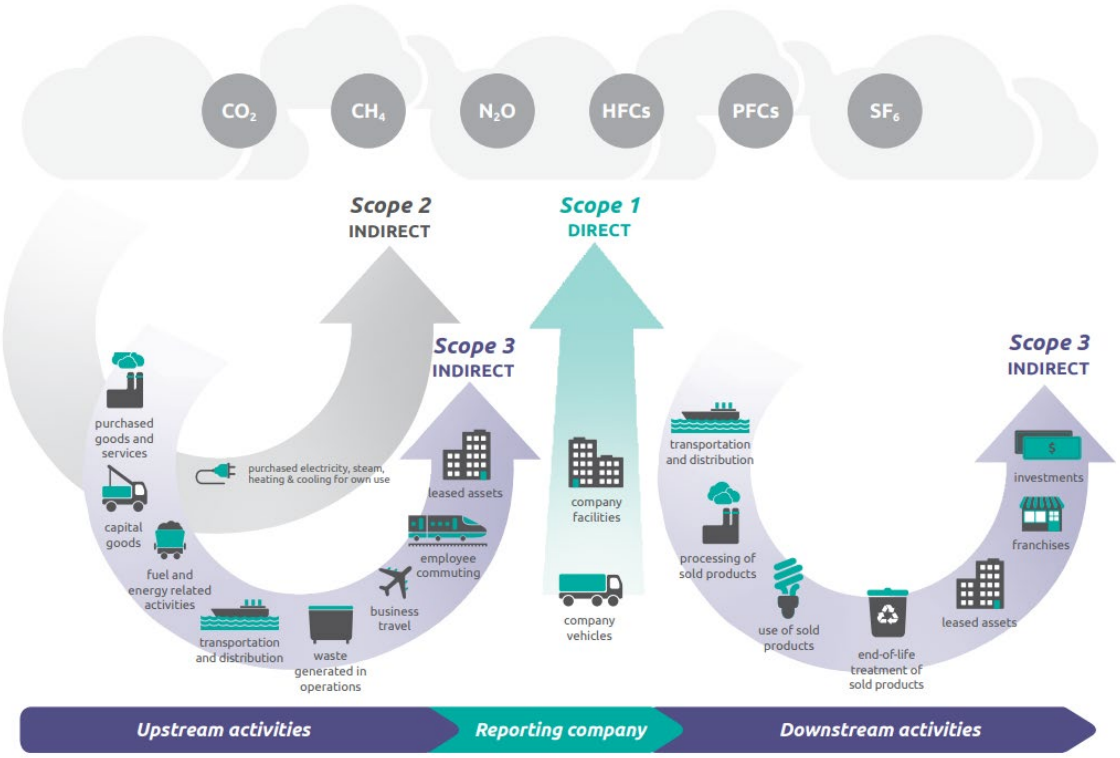
Six main greenhouse gases identified by the Kyoto Protocol

Carbon dioxide	Methane	Nitrous oxide	Hydro-fluorocarbons	Per-fluorocarbons	Sulphur hexafluoride
CO_2	CH_4	N_2O	HFCs	PFCs	SF_6

[15] https://unfccc.int/kyoto_protocol

Greenhouse gases are categorised into three types or ‘scopes’ by the Greenhouse Gas Protocol, the world’s most used greenhouse gas accounting standard.

Overview of GHG Protocol scopes and emissions across the value chain



Source: Greenhouse Gas Protocol, Corporate value chain (scope 3) Accounting and Reporting Standard, 2011