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Northumbrian Water Pension Scheme

2024 TCFD report

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1. Introduction

1.1. Chair's Introduction

We recognise the need for urgent, collective action on climate change

This is our third Task Force on Climate-Related Financial Disclosures (TCFD) report.

Climate change remains a significant global challenge, with increasing scientific evidence that global temperatures are likely to climb above the targeted maximum increase of 1.5 ^{o}C above pre-industrial levels without increasingly urgent action. The responses to this global challenge will determine the health and prosperity of the world now and for future generations.

We recognise that climate change presents a risk that could impact member outcomes. The impact of climate change is already being felt across the globe, and, left unchecked, could lead to substantial financial, environmental and social consequences. We therefore consider a thorough assessment and understanding of climate related risks and impacts to be an integral part of performing our fiduciary duty to protect member benefits. This objective can be aligned, rather than at odds with, the desire to protect and preserve the natural environment.

In addition to this, the rapidly evolving geopolitical tensions are likely to affect the pace and the cost of the climate transition, which could also impact member outcomes.

Integrating sustainability matters makes sense for our members

We think there are good investment reasons to consider sustainability, and climate change in particular. By not considering major sustainability matters, including environmental, social and governance issues, we would be giving an incomplete perspective of the risks to the investments.

Our commitment

We have committed to support the objectives of the Paris agreement to limit the increase in the global average temperature to well below 2°C above pre-industrial levels and pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels.

To achieve the 1.5°C goal, the global economy needs to progress towards net-zero greenhouse gas emissions by 2050 with a 50% reduction by 2030. Net zero means not adding to the amount of greenhouse gases in the atmosphere through human activity. We have committed to aligning our investments to the progression towards net-zero greenhouse gas emissions in the global economy by 2050 at the latest.

To achieve this, we seek to drive real world change and align our portfolios by encouraging (via the asset managers we employ) underlying investments issuers to target net-zero greenhouse gas emissions by 2050 by setting science-based targets (including interim targets for reductions by 2030) for emissions reductions appropriate to their sector and geography and developing and executing on realistic transition plans to achieve this.

Sustainability beyond climate change

Climate change is one of a number of sustainability issues important to our investment strategy. We have selected several sustainability themes as part of new requirements relating to most significant votes. Our themes are:

- **Climate Crisis** (with a focus on climate change and net zero greenhouse gas emissions)
- **Environmental Impact** (with a focus on biodiversity, deforestation and water)
- **Human Rights** (with a focus on living wages, gender equality, and health & nutrition)

Strong governance underpins each of these priorities, and the Trustees expect managers to uphold high governance standards in their investment processes. This includes robust oversight of company boards, transparency in decision-making, and clear accountability mechanisms to ensure meaningful action across Climate Crisis, Environmental Impact, and Human Rights.

1.2. What is climate change?

Climate change refers to global warming caused by the greenhouse gas emissions of human activity. This leads to the increased frequency and severity of weather events, such as droughts, sea-level rise, floods, heat-waves, hurricanes and wild-fires.

Globally, we emit around 51 billion tons of greenhouse gases a year. Most of our emissions come from industry (in particular cement, steel and plastic), energy (including electricity, heating and cooling), agriculture and transport. To stop climate change, we need to stop emitting greenhouse gases.

The greenhouse gases that trap heat in the atmosphere includes carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O) and fluorinated gases.

The Paris Climate Agreement seeks to limit warming to 1.5°C. This looks to be a challenging target due to the need for unprecedented reductions in greenhouse gas emissions, rapid depletion of carbon budget (maximum amount of CO2 emissions that would result in limiting global warming to a given level), and various technological, economic, and political constraints.

1.3. What are our commitments and beliefs?

Climate change is now a widely established and socialised concept within financial markets – both as a financial risk, due to transition and climate-related risks, and an investment imperative, because the way in which we direct capital will support (or hinder) climate targets.

We believe that our investment portfolio should be constructed in alignment with the achievement of net zero greenhouse gas emissions by 2050, with 50% emissions reduction by 2030, consistent with the Paris Climate Agreement goals of limiting global warming to 1.5°C versus pre-industrial levels.

Our starting point is to stay invested and have influence rather than disinvest.

That said, in the same manner that some investments are judged to be too risky irrespective of returns, some investments will be judged to have too negative a real-world impact, in particular, with regard to systemic issues, such as climate change.

As investors, we have a critical role to play, and we can use our influence to drive change. We believe in collective action. More is to be gained from collaborating with other like-minded investors and supporting joint initiatives to tackle climate change.

We exert influence on companies via our OCIO and investment managers. We engage companies, governments and stakeholders to address climate change-related risks, and to implement transition plans consistent with the Paris Climate Agreement.

1.4. What is TCFD?

The Taskforce for Climate-related Financial Disclosures (TCFD) was established in 2015 by the Financial Stability Board (FSB).

The TCFD is an industry-led reporting framework that sets out recommendations for issuers and financial market participants to organise and standardise climate disclosures.

It was set up because the FSB considered that:

- The financial risks and opportunities posed by climate change are not fully understood and not fully priced by financial markets
- Corporate and financial institutions are not prepared for the transition to a low carbon economy
- This will lead to the misallocation of assets, the risk of asset stranding, and market volatility and dislocation

The TCFD has since been adopted by regulators, including by the UK government.

1.5. What are the regulations?

The UK government has amended the Pensions Bill[1] to require large pensions schemes and Master Trusts, to publish a TCFD report.

The regulations include the following requirements, across four themes, which we will cover in this report:

- Governance, including how we:
  - Oversee financially-material climate change risks and opportunities
  - Apply processes to stay informed on climate change
  - Disclose our role with respect to climate change risks and opportunities
  - Disclose third parties' role with respect to climate change risks and opportunities
- Strategy:
  - Consider climate-related risks and opportunities of our investment and funding strategy using at least two scenarios of which one is Paris-aligned (e.g. 1.5ºC)
    - A scenario assesses the financial risk of a certain degree of warming, and is used due to the unpredictability of climate change
    - We have selected three scenarios, 1.5°C, 2°C and 3ºC
  - We assess the resilience of investment and funding strategies under each of these scenarios, which includes consideration of impact on asset value
- Risk management, including how we:
  - Identify and assess climate-related risks and opportunities and manage their impact on our investment and funding strategies
  - Use different risk management tools alongside our advisors

[1] Governance and reporting of climate change risk: guidance for trustees of occupational schemes

- Metrics and target setting:
    - Absolute emissions-based metric (which we'll explain later in the report)
    - Intensity emissions-based metric (which we'll also explain later in the report)
    - Alignment emissions-based metric (which we'll explain later in the report)
    - One other emissions-based metric. We've decided to disclose data availability / coverage due to the importance of climate data in TCFD reporting
    - A non-binding emissions reduction target. Our target is net zero greenhouse gas emissions by 2050, with 50% emissions reduction based on 2022 levels by 2030

2. Governance

Introduction

As Trustee, we consider climate change to be a significant risk, which is reflected in how we interpret our duties and responsibilities. The Trustee believes that Climate Change related Risk and Opportunities (CCRO) are, and will continue to be, a financially material factor and as such is incorporated in our investment decision making. The Trustee further believes that, to the extent our decisions, including investment related decisions, have an impact on climate change, it is appropriate for us to aim to minimise the harm done by our decisions to the extent this can be done without compromising our financial responsibilities.

To fulfil our duties to the Scheme regarding CCRO, we have prepared climate change policies which are detailed in the Scheme's Statement of Investment principles (nwgpensions.co.uk/globalassets/pensions-pdfs/nwps-sip-july-2023---clean.pdf) and we have put in place a governance framework that provides structure for making climate-related decisions and to ensure that we integrate climate risks and opportunities in our decisions on behalf of our members, which include investment related decisions. It shows where responsibility lies for decision making and sets out how this work is integrated into our longer-term plans, monitoring framework and meeting cycle.

This framework has been prepared in line with the latest regulation and guidance. This includes the Pension Schemes Act 2021 and the Occupational Pension Schemes (Climate Change Governance and Reporting) Regulations 2021 (the Regulations), statutory guidance for climate governance and reporting of CCRO issued by the Department for Work & Pensions (DWP), the guidance prepared by The Pensions Regulator (tPR), the non-statutory guidance prepared by the Pensions Climate Risk Industry Group (PCRIG), as well as recommendations set out in the Taskforce for Climate-Related Financial Disclosures.

The framework comprises three main elements:

1. Trustee Oversight
2. Trustee Knowledge and Understanding
3. Third-Party Providers

2.1. Trustee Oversight

The Trustee is ultimately responsible for the oversight of CCRO as they relate to the Scheme. The Trustee has delegated responsibility for dealing with climate change to the Trustee's Funding and Investment Committee (FISC).

Climate change is a financially material risk that we consider in our decision making.

The Trustee is required to agree a governance framework to agree certain climate change metrics and requirements including:

- Agreeing the types of climate-related risks and opportunities which they consider will have an effect over the short, medium and long terms on the Scheme's investment and funding strategies
- Agreeing the time periods which comprise the short, medium and long term applicable to the Scheme, taking into account the Scheme's liabilities and its obligations to pay benefits as appropriate
- Ensuring that the Scheme's risk management processes adequately incorporate the identification, assessment and effective management of relevant climate-related risks
- Agreeing appropriate climate-related targets for the Scheme
- Agreeing the climate-related metrics that are used to measure progress towards the climate-related targets, which will include at least one absolute emissions metric, one emissions intensity metric, one alignment metric, and one additional climate change metric
- Agreeing the Scheme's approach to scenario analysis, including the scenarios to model (which will include at least two scenarios where there is an increase in the global temperature and in at least one of those two scenarios the global average temperature increase selected will be within the range of 1.5 and 2 degrees Celsius above pre-industrial levels)

The Trustee has set the following governance framework to agree the above metrics and requirements:

- The FISC will review the metrics, targets, scenario analysis etc annually.
- The FISC will be responsible for implementing the investment strategy. The FISC aligns its investment decisions with the Trustee's climate change policy.
- The Trustee will maintain oversight through its quarterly reporting and meeting cycle where CCRO matters are considered.

Therefore, the Trustee considers that the time, governance and resources spent on CCRO (as outlined) is appropriate.

2.2. Trustee Knowledge and Understanding

While we are not directly involved in the day-to-day investment decision process, we as the Trustee, are ultimately responsible for ensuring that CCRO are identified, assessed and managed on behalf of the Scheme and its members. We are therefore required to have sufficient knowledge and understanding of the types of climate-related risks and opportunities which may have an effect on the Scheme and in order to set metrics and targets for our service providers and interpret the results of any analysis and reporting provided to us. We need to ensure that we are sufficiently informed so that we are able to challenge assumptions, external advice and information received and to fully understand any proposals developed by our advisers. The Trustees therefore ensure that they have sufficient knowledge and understanding of the principles relating to the identification, assessment and management of CCRO including:

- Understanding how scenario analysis works
- Setting metrics and targets
- Interpreting the results of any analysis and how this applies to investment decision making
- Reporting

The Trustee maintains its Knowledge and Understanding with respect to climate change by:

- Identifying regulatory developments that are relevant to the Scheme, including guidance provided by the Pensions Regulator and the Department for Work and Pensions
- Attending specific training sessions on climate change and TCFD requirements run by our OCIO and our Investment Adviser

2.3. Oversight of OCIO, Investment Adviser and third-party providers

We do not carry out underlying investment activities ourselves but rely on our OCIO, Investment Adviser and third-party asset managers to identify and assess climate change risks and opportunities. We will also consider input from other third-party providers, specifically the Scheme Actuary and the Scheme's Covenant Adviser.

Willis Towers Watson, as the Scheme Actuary:

- Advises on the funding position including an understanding of the potential funding impact resulting from changes to financial or demographic assumptions driven by climate change;
- Advises on funding strategy robustness to climate risk. Provides input to enable strategic decisions to be made considering impact of climate risks on funding strategy; and
- Provides input into scenario analysis and advises on funding implications.

The Scheme's Covenant Adviser, EY, advises the Trustee in relation to the Scheme sponsor's ability to continue to support the Scheme. The employer covenant is the extent of the employer's legal obligation and financial ability to support the Scheme now and in the future.

Climate-related exposures could have a positive or negative impact on the strength of the Scheme sponsor's covenant. Therefore, EY provides climate-related matters in the covenant advice provided to the Trustee.

EY works in conjunction with the Trustee, the Scheme's other advisers and the Scheme's OCIO to assist the Trustee in producing the Scheme's TCFD report on an annual basis, in line with TCFD requirements.

When selecting third-party providers, we require each provider to demonstrate sufficient credentials in relation to the assessment of climate-related matters. This is done by assessing the providers in terms of their:

- Level of understanding on climate change and climate risks and opportunities
- Whether they have commitments to decarbonisation targets, including the Paris Climate Agreement of global warming to +1.5°C
- Corporate policies focusing on reaching stated decarbonisation targets
- Resources in place to deliver to climate related objectives
- Ability to report to us
- Associations with and involvement in relevant industry bodies

The FISC reviews its third-party providers on a regular basis to ensure all stated processes for those managing / advising the Scheme on climate governance remain appropriate. As part of this review the FISC reviews and challenges the analysis of its third-party providers.

Our OCIO assesses our third-party fund managers' climate change competency. This forms part of their overall assessment when selecting a manager and part of the ongoing monitoring of the managers through an annual ESG questionnaire and regular monitoring calls.

3. Strategy

3.1. The short-, medium- and long-term time periods identified for our Scheme

Consistent with guidance from the Pensions Regulator and the position of our Scheme, we, the Trustee, consider the following time periods:

Period	Time period	Rationale
Short-term	Up to 5 years	The short-term refers to the period over which we focus on those risks that have been delegated to external investment pools and managers; these mandates are typically judged over time horizons of up to five years. This is also the period for which the current investment strategy is expected to remain in force.
Medium-term	Up to 10 years	The medium-term refers to the period over which we focus on those risks that currently fall outside the scope of the external investment management mandates but which are not considered to be long-term in nature, for example risks relating to broad market conditions or to identifiable anomalies or trends in the investing environment that fall across multiple asset classes.
Long-term	Up to 20 years	The long-term refers to the period over which the majority of the benefit payments are expected to be made by the Scheme with respect to the current membership. Whilst the Scheme could exist for longer than the 20 years, it is understood that by that stage the Scheme will be mostly invested in government and corporate bonds or potentially insurance contracts where the Trustee will have less influence.

3.2. The climate change-related risks and opportunities that will affect our Scheme's investment strategy over the short-, medium- and long-term

We consider the following climate change-related risks and opportunities :

Risk	Detail
Physical risks & opportunities	The physical risks relate to the increase in weather events that result from a warming, and unpredictable climate, such as rising sea levels, droughts, floods, and wild-fires
Transition-related risks & opportunities, i.e., policy, legal, reputational and technology, including environmental opportunities;	The transition-related risks relate to the need to transition a business to be consistent with the decarbonisation pathways set out in the Paris Climate Agreement.
Systemic risks & opportunities i.e., economic implications	The systemic risks relate to the economic impact of extreme weather events, political activity and policy progress. There will be social and economic impact across our portfolio, which needs to be managed across the short-, medium- and long-term.

Physical risks over the medium-term (up to 10 years) are relatively similar regardless of the scenario we look at because in all scenarios the climate will continue to warm to at least 1.5 degrees over this period. Nonetheless we expect increasing impacts of climate change such as extreme weather over this period under all scenarios. In the longer term the physical risks will start to diverge substantially in warmer versus cooler scenarios. We expect that the discounting of these physical risks will start to be priced into markets more quickly in the medium term i.e. we will not need to wait for the very long term for physical risks to start to be reflected in asset prices.

For our scenario analysis we choose to focus on the medium-term time horizon. Despite little difference in physical risk, this is a time horizon over which we could see dramatic shifts in policy and consumer responses to climate change so we believe it is the most useful time horizon for Trustee decision making.

The table below summarises the climate change-related risks likely to materialise reported by The Bank of England's Prudential Regulation Authority[2]:

[2] https://www.bankofengland.cnot o.uk/climate-change

Climate-related risk		Short/Medium/Long Term	Main causes of financial impact on members
Physical	**Acute**	Medium/Long	Increased frequency and/or severity of extreme weather events
	Chronic	Medium/Long	Steady increase in global sea levels and changes in precipitation patterns
		Medium/Long	Rising temperatures
Transitional	**Policy and legal changes**	Short/Medium	Regulations of existing products and services
		Medium/Long	Sectors facing penalty incentives could harm current business models
	Market demand	Short/Medium	Changing consumer behaviour
	Technology	Medium	Existing products replaced with lower emission technology
	Reputational	Short/Medium	Increased scrutiny following changes in stakeholder's perceptions of climate-related action or inaction
Liability	**Direct**	Medium	Those seeking compensation for financial losses as a result of physical and transitional risks
	Third-party	Medium/Long	Those seeking compensation for damages of physical risk

3.3. The impact of the risks and opportunities on the Scheme's investment strategy

We consider climate change-related risks and opportunities in relation to the Scheme's investment strategy, including the asset allocations and asset management structure. Climate change-related risks and opportunities could, for example, affect:

- The dividend paying capability and the share prices of companies which we own (either directly or indirectly);
- The prospects and prices of portfolios that we invest in via derivatives;
- The creditworthiness of the issuers of the fixed income assets in which we invest;
- The prospects for banks and other financial institutions that we place cash with;
- Systemically, impacting multiple parts of the portfolio at the same time, and in the same direction.

We consider climate change-related risks and opportunities in a number of ways:

- Our investment policy, and how climate change may affect the different asset classes we are invested in over time;
- Asset class selection and their susceptibility to climate risk;
- Allocation within an asset class;
- Selection of instruments.

3.4. Scenarios

3.4.1. Details of the most recent scenarios we have selected

Our three scenarios are detailed in the table below:

Scenario	Detail
1.5°C "Paris-aligned transition" *This is our goal*	• AIM/CGE3 1.5°C assumes measures are taken that will keep the rise in temperature limited to 1.5°C
2°C "late transition" Following a review in conjunction with our OCIO, this is a forecast of what we think is most likely to happen	• Late AIM/CGE 2 °C assumes measures are introduced to tackle climate change, but are introduced too late to meet the Paris Agreement
3°C "slow transition" *This is our hot-house scenario*	• AIM/CGE 3°C assumes current policies being continued. According to the UN, we are currently on track for 3°C warming

3.4.2. The reasons for choosing the scenarios we have used

Each scenario consists of a degree of warming and an assessment of its impact on the portfolio. In other words, what do we expect the financial risk to be, and across which asset classes / investments, based on a certain degree of warming?

We have chosen to disclose three scenarios, because we believe this provides us with sufficient scope to inform our investment decisions. They are scenarios that highlight the impact of physical risks and transition risks as well as systemic risks in different scenarios and so enable us to draw conclusions about the different components of climate change-related risks and opportunities.

3.4.3. The resilience of our investment strategy in these scenarios (in other words, the results)

For the following analysis, we have considered the period to 2030 consistent with our medium-term time horizon for the Scheme. We are realistic about the challenges with scenario analysis; it is too complex an impact to model far into the future with high confidence and too long a time horizon to be decision useful for the Trustee. Nonetheless, it is important that we try to reflect the types of risks and opportunities that our strategy may face over the medium-term that may not materialise over shorter-term time horizons. We believe 2030 is an appropriate timeframe as it is enough time for different policy and economic outcomes to develop and affect markets and to be decision useful for the Trustee.

We have chosen not to provide a *quantitative assessment* of scenario risks, as we believe that the commercially available scenario metrics are inadequate in the way they quantify climate change risks. Instead, we have chosen to provide a *qualitative assessment* of various risks and ultimately portfolio outcomes based on narrative scenarios across the three scenarios for climate outcomes. These scenario narratives and portfolio impacts are set out in detail in the Appendix 6. Our analysis incorporates physical

[3] The AIM/CGE model is a multi-regional, multi-sectoral, computable general equilibrium (CGE) model.

and transitional risks but also separates out systemic risk (impacts on the whole economy) which is often missing from current climate scenario modelling.

As a summary, the impact is set out in the table below:

	1.5°C	2.0°C	3.0°C
Physical Risk	*Moderate*	*Moderate*	*High*
Transitional Risk	*High*	*Low*	*Initially moderate but increasingly uncertain*
Systemic Risk	*Positive*	*Moderate*	*High*
Portfolio Impact	**Positive**	**Moderate**	**Negative**

Definition of risk types:

Physical Risks: The impacts of climate change on physical assets owned by a company or in its supply chain, from climate change. For example, the damage to a factory due to coastal flooding and storm damage

Transition Risks: The impacts of climate change on the individual assets due to changing climate policies, legal risks, market and reputational risks faced by companies, particularly as reflected in the increase of either direct or indirect costs of greenhouse gas emissions of the company or its supply chain

Systemic Risks: The macro effects of the consumer and government policy responses to climate change which affect overall economic growth, inflation and broad market outcomes.

Portfolio Impact: The combined effect of the scenario on both assets and liabilities.

Further detail of the scenarios can be found in the Appendix.

3.4.4. Describe the key assumptions for the scenarios you have used and any limitations of the modelling

We used a qualitative scenario assessment compared to quantitative analysis due to the complexities and inaccuracies involved in forecasting the degree of warming that will result from climate change, including:

- Uncertainties surrounding regional projections of climate change
- Uncertainties around the government policies which will drive transition risks including legislation and regulation, monetary policy and fiscal policy
- Uncertainty around consumer reaction to climate change and how preferences may change over time
- Uncertainties around the economic impacts on future growth and inflation of both the climate change factors and the government policies.
- Uncertainties around the market reactions to changes in policy, consumer behaviours, growth and inflation prospects

Key assumptions are explained in the narratives explaining the scenarios in Appendix 6 and focus on overall growth asset performance and the effects of interest rate and inflation on liability values.

3.5. Engagement

3.5.1. Engagement with companies and governments

Our goal is net zero greenhouse gas emissions globally, and we seek to use our influence to achieve this. In the long-term, this is the only effective strategy to mitigate the systemic effects on markets of climate change.

As such:

- We will resist pressure to modify portfolios to meet headline portfolio level decarbonisation targets at the expense of incentivising the necessary real-world transition. We believe it is important to engage with companies and governments and to supply enabling capital to achieve long term profitable transformation and decarbonisation than it is to hit short term carbon footprint target metrics.

For example, emerging markets, which have higher carbon footprints, in part because they produce carbon intensive goods consumed by developed markets, require capital in order to transform their economies.

For these reasons, portfolio decarbonisation targets will continue to be reviewed at least every three years to ensure they remain appropriate and aligned with fiduciary objectives.

3.5.2. Asset manager engagement

The Trustee expects:

- UK-regulated asset managers to be signatories of the Stewardship Code;
- Non-UK regulated managers to exercise their voting rights in a manner consistent with a focus on medium and longer term investment performance.

As part of their responsibilities, where applicable, the Trustee expect the Scheme's asset managers to:

- Engage with investee companies with the aim to protect and enhance the value of assets; and
- Exercise the Trustee's voting rights in relation to the Scheme's assets;
- Incorporate the Trustee's views on climate change risk and opportunities.

With the assistance of our OCIO, the FISC undertakes an in depth review of the investment managers' ESG credentials, including their stewardship and voting activity and policies every year. Our OCIO monitors the stewardship activity of our investment managers on an ongoing basis and alerts the FISC of any material concerns between this review period.

4. Risk Management

4.1. Identifying climate change-related risks and opportunities

We recognise that climate-related risks can be financially material and that incorporation of identified risks and opportunities into Scheme risk management is therefore essential.

Alongside the risks highlighted in section 3.2, the Trustee has further identified the following risks as posing the greatest potential loss and being the most likely to occur:

- Risk 1 – we do not correctly identify portfolio risks from climate change - new risks are likely to emerge (physical, transitional and systemic);
- Risk 2 – insufficient policy action globally to avoid a “hot-house” scenario (the 3 degree scenario) – which results in longer term systemic risks from overall markets and negative effects for the portfolio;
- Risk 3 – policy action globally accelerates more quickly than anticipated leading to unexpected asset stranding and the portfolio is not able to capture the positive benefits in this scenario
- Risk 4 – correlated portfolio risks - while asset managers may consider the individual climate change related risks and opportunities per company or investment, the Trustee needs to consider them across the portfolio as a whole.

We have identified these risks in conjunction with our OCIO and our Investment Adviser who, in addition to their own research from their sustainability team have worked on identifying risks together with expert organisations such as the IIGCC, PCAF and MSCI (see section 4.3 below).

4.2 Assessing climate change-related risks and opportunities

The Trustee governs the portfolio and oversees the OCIO, Investment Adviser, FISC and the Scheme’s investment asset managers (Asset Managers) who help scan, measure and monitor the climate change risks and opportunities and determine their relevance to the Scheme. The Trustee along with their OCIO, adopt a variety of methods to help with the analysis including:

- Reviewing relevant background material and identifying regulatory developments that are relevant to the Scheme, including guidance from the Pensions Regulator and Department for Work and Pensions;
- Engaging with peer groups, industry bodies and advisers;
- Identifying relationships between events and news, and business and financial impacts to manage reputational risks;
- Identifying and assessing physical, transitional and systemic risks over different time horizons;
- Considering the impact of physical ,transitional (including operational) and systemic risk factors.
- Integrating the climate related risks within the Trustee’s wider risk management framework and risk register

4.3 The risk management tools we – and our investment adviser and OCIO – have used

Climate Scenario Analysis

Scenario analysis allows us to consider potential outcomes in different scenarios and think through the impact on different individual positions and the overall portfolio. This can be used to consider the appropriateness of the overall strategic asset allocation.

LDI hedging

The Trustee considers the appropriate level of LDI hedging.
The Trustee has adopted an approach of maintaining the hedging in line with the asset value to stabilise the funding ratio i.e. the Scheme's assets move in line with the liabilities for shifts in interest rates and inflation expectations. The impact of climate change on real and nominal interest rates is highly uncertain in the different scenarios, so this hedging strategy eliminates that uncertainty on the funding ratio of the Scheme. However, this strategy does require sufficient collateral to maintain the LDI hedges in scenarios where interest rates or inflation expectations increase. Maintaining sufficient liquidity is part of the risk management strategy of the LDI portfolio.

Portfolio risk management tools

The OCIO may deploy a risk management overlay to protect the value of assets. This may include exposure to inflation assets, government bonds or options on equities and interest rates. These tools can be effective in protecting the portfolio from more acute risks at moments in time. However, these tools may not be effective against longer term slower developments of chronic risks such as climate change induced risks. Therefore, they need to be deployed dynamically by the OCIO overseen by the Investment Adviser, Trustee and FISC.

Portfolio Analysis tools

In 2020, our OCIO, Cardano, appointed MSCI as its external sustainability data provider. The appointment followed an RFP process which reviewed the service offerings of different providers. Cardano selected MSCI for a number of reasons, including the extent of its coverage, MSCI's research process (and as such, data reliability), and portfolio scenario analysis based on degrees of warming, following the acquisition of carbon delta in 2019[4].

The appointment (and reappointment) is also overseen by our OCIO's Group Sustainability Steering Committee.

This data provides insights into where climate risk may be most acute on a geographic, sectoral and individual security level both from a physical and a transition risk perspective. It is used by the OCIO and Trustee to understand and discuss risk exposures. It is not particularly useful when considering systemic risks which tend to be underestimated in the models used, where the OCIO makes use of their approach to macro scenario analysis.

[4] https://ir.msci.com/news-releases/news-release-details/msci-strengthen-climate-risk-capability-acquisition-carbon-delta

Participation in industry groups working on methodology development, in particular, IIGCC and PCAF

The DWP's TCFD regulations set out multiple methodologies to determine corporate and sovereign greenhouse gas emissions metrics. There remain methodological challenges for 'hard to reach' asset classes, such as hedge funds, commodities and derivatives.

Our OCIO participates in and contributes to multiple industry initiatives to develop and evolve metrics and reporting on climate change, in particular, IIGCC and PCAF. IIGCC is the Institutional Investors Group on Climate Change, and it hosts the Paris-Aligned Investment Initiative and the Net Zero Investment Framework. The initiative sets out the advantages and disadvantages of the multiple methodologies used to determine a company's, and portfolio's, absolute emissions, emissions intensity, and more recently, environmental alignment.

Internal controls

Our OCIO has implemented internal controls in the preparation of TCFD metrics and scenarios. These include, but are not limited to, education, data validation, analysis peer review and industry comparisons. We have assessed these internal controls to ensure they are appropriate.

Finally, we note that there will be inaccuracies in the data. In some markets, corporate greenhouse gas emissions disclosures are not regulated, and not subject to audit. The quality of the data is constantly improving. We believe that the processes we have implemented are market-leading and mitigate for known limitations in data quality and coverage. Our OCIO will continue to engage with standard-setters, policymakers, data providers and companies to improve data quality.

4.4 Understanding covenant risks

The Trustee has engaged its covenant advisor, EY, to understand the TCFD considerations and potential impacts for Northumbrian Water Group Limited ("NWGL" or "the Group"), which EY undertook in respect of the Scheme.

Covenant climate risks remain broadly unchanged but are now recognised in the PR24 final determination and the Group's business plan contains more detailed mitigation. Key points are highlighted below:

- Climate risks facing the covenant have been considered before 2023. While the risks have not materially changed over the intervening period to 2025, the importance of addressing these risks has been amplified from the Group's perspective through the regulatory regime.
- Ofwat's PR24 framework includes stricter performance commitments, higher financial penalties and clawbacks for water companies that fail to meet regulatory standards. As such it has become even more critical to deliver on the planned mitigation actions.
- The Final Determination includes significant allowance for climate related capex albeit the Group considers this to not fully cover spend required to improve asset health and no allowance has been given to improve power resilience (these matters form part of the appeal to the CMA).
- Even before this shortfall, significant equity funding needs of c.£2.5bn are anticipated to be required through to 2050. In the context of the minimal (c.£283m) gearing headroom, it is probable that the Group will need to secure additional support to maintain compliance with its covenants. Management consider that the shareholders remain supportive albeit the CMA outcome, particularly re WACC, will be important.

- The Group has advanced in its mitigation actions by building robust strategies to improve resilience against the impacts of climate change. However, there is no greater visibility on the financial impacts of the risks and benefits of these mitigation plans.

Climate-related risks on covenant

The climate related risks previously identified remain valid with the Group remaining exposed to both physical and transition risks

Some of the key physical risks identified by NWG include:

- Increased frequency and severity of storm events (2023-24 witnessed record storms since 2015) intensifying pressure on the Group's network and resilience planning;
- Drought / water supply deficit forecast across all water resource zones from 2025 (a material escalation from 2023 which flagged only parts of Essex and Suffolk);
- Rising temperatures impacting asset performance with certain treatment chemicals (like sodium hypochlorite) and filtration system becoming less effective;
- Reduced availability of freshwater for abstraction following increased saltwater intrusion (River Waveney);
- Heightened emphasis on the interdependencies between risks, such as storm events affecting both power and water simultaneously. Funding has not been provided by Ofwat in the final determination to cover increasing resilience of power supply; and
- Increased performance challenges during extreme weather events and long-term maintenance associated with scaling of nature-based solutions (such as wetland restoration, green roofing) over engineering approaches.

Transition risks refer to the shift to low-carbon economy. There is a need for increased investment to implement the climate change mitigation policies reflected by a significant increase in capex spend to £6.2bn for PR24 (£3.6bn in PR19) and deployment of new technologies for carbon reduction.

Mitigating actions for climate risks

Over the intervening reporting period between December 21 and April 25, there has been a notable shift towards more specific and robust mitigation strategies, particularly in the areas of targeted protection measures, enhanced water resource management, and emergency response planning.

- Drought and water supply - advanced Water Resource Management Plans ('WRMPs') that build resilience against extreme drought scenarios (up to 1-in-500 year drought), roll out of Smart Metering and promotion of water efficiency, and exploring new water sources and interconnections in dry regions like Essex and Suffolk;
- Flooding and Storm overflows - detailed plans for back-up power supplies and targeted interventions at treatment works for flooding and heat, investments aligned with the storm overflow discharge reduction plan, major upgrades under the Drainage and Wastewater Management Plan ('DWMP'), use of Sustainable Urban Drainage Systems ('SUDS') to manage stormwater naturally and investment in overflow storage and pumping capacity;
- Heatwaves and high temperatures - upgrading slow sand filter treatment works; protecting heat-sensitive chemicals like sodium hypochlorite and tackling algae growth and nitrate issues in warm raw water;
- Sea level rise & coastal risks - protection and relocation planning for coastal infrastructure and engagement in catchment-based flood management.

- Wind storms & power disruption - investment in resilient power supplies, site access, and emergency backup and focused upgrades in high-risk North East regions.
- Enhanced Emergency Response and recovery plans to ensure business continuity in case of failures; and
- Greater emphasis on nature-based solutions to transform infrastructure for a lower carbon future (e.g., electrification of light commercial vehicles).

Group's PR24 final determination (capex and targets):

Capex: £6.2bn (PR19: £3.6bn)		
Storm overflow investment	£1.1bn	Reduce spills by **28%**
Prevent nutrient pollution	£387m	Reduce phosphorus by **5%**
Leakage and water efficiency	£118m in smart metering	Reduce leakage by **7%**
Green-house gas emission		Reduce by **16%**

4.5 Understanding funding risks

The Trustee has carried out climate change scenario analysis in partnership with its actuarial adviser. The aim of this analysis was to help the Trustee to quantify the potential effects of climate change on the Scheme's liabilities. The Trustee recognises that this analysis relies on a large number of assumptions and is a new area of modelling that will develop over time; the Trustee therefore believes the results should be treated carefully and should only be one of a number of factors considered when considering the Trustee's action in relation to climate risk and also the Trustee's decisions around investment strategy. The Trustee investigated three scenarios in relation to understanding funding risks:

- **Climate Emergency** – This assumes an immediate, ambitious and coordinated response in which aggressive policy is pursued. In this scenario we expect a temperature rise of approximately 1.5ºC relative to pre-industrial levels. Physical risks are expected to be very low while transition risks are likely to be moderate.
- **Inevitable Policy Response** – This assumes a delay in meaningful action but a rapid shift in policy in the mid/late 2020s. In this scenario we expect a temperature rise of approximately 2.0ºC relative to pre-industrial levels. Physical risks are expected to be relatively low while transition risks are likely to be high.
- **Lowest Common Denominator** – This assumes a 'business as usual' scenario in which temperatures rise approximately 3.5ºC relative to pre-industrial levels. Physical risks are expected to be high while transition risk is likely to be low.

The key findings from the scenario analysis are outlined below. We also recognise that the shocks outlined below could be larger and may well be priced in during a shorter time horizon.

Liability approximate % change	Climate Emergency 1.5 Degrees	Inevitable Policy Response 2 Degrees	Lowest Common Denominator 3.5 Degrees
Liability impact	-0.5%	-1.9%	-3.9%

Notes: Liabilities shown on Technical Provisions (TP) basis as at 31 December 2024. Scenarios used by WTW aligned with those used by Cardano

5. Metrics and Targets

5.1. Terminology

The GHG Protocol Corporate Standard[5] classifies a company's GHG emissions into three 'scopes':

Scope 1[6]: Direct emissions from owned or controlled sources.
Scope 2[6]: Indirect emissions from generating purchased energy.
Scope 3[7]: All indirect emissions not included in Scope 2 in the value chain of the reporting company, including upstream and downstream emissions.

Carbon dioxide equivalent (CO2e) measures the emissions from various greenhouse gases on the basis of their warming potential, by converting amounts of other gases to the equivalent amount of carbon dioxide with the same global warming potential.

5.2. Who is our data provider?

Approach to data collection

Our third-party managers are requested to provide climate-related analysis for their portfolios. This is to encourage our managers to carry out their own assessments and gain oversight of the climate-related risks and opportunities from the companies in which they invest.

For managers who fail to provide data for the purpose of TCFD reporting, our OCIO produces the analysis based on proxy indices applied to the managers' portfolios. Our OCIO employs the services of MSCI to provide them with data and metrics. Measuring the success of sustainability initiatives requires new types of data analysis. A third-party data provider allows us to improve our portfolio analysis and provide valuable insight into ESG factors that can have a significant impact on investment outcomes.

Our OCIO's primary data source is MSCI ESG and Climate Scenario analytics, which they use to assess the sustainability our investments and is included in their regular reporting[8].

[5] https://ghgprotocol.org/sites/default/files/standards_supporting/FAQ.pdf
[6] https://www.epa.gov/climateleadership/ghg-inventory-development-process-and-guidance
[7] https://www.cityoflondon.gov.uk/services/environmental-health/climate-action/key-climate-terms
[8] https://www.msci.com/our-solutions/esg-investing/climate-solutions/climate-risk-reporting

5.3. What are the limitations?

We recognise the importance of managing climate change-related risks and opportunities – but also the challenges involved in doing it well. We continue to develop and evolve our policies to reflect climate change-related challenges. This reflects the evolution of our thinking on sustainability and the changes underway in the financial services sector, and society more broadly.

We are acutely aware that managers' methodologies can vary and whilst we encourage our managers to follow best practices and complete industry standard templates, there is a limit to the extent we can practically vet the data provided.

When measuring at portfolio level, where we aggregate the emissions of investee companies, we recognise that there remain gaps in data availability, in particular, regarding Scope 3 emissions.

Scope 3 emissions help us better understand a company's sensitivity to climate change-related risks and opportunities, and its ability to transition. It can therefore help to understand relative performance of different companies within industries.

While we believe companies should disclose their Scope 3 emissions we note that there are a number of data challenges which will take time to resolve.

As at the reporting date, the Scheme's investments consisted of Equity, Credit, Hedge Funds and Property. Property and Hedge Funds are not currently regulated to disclose portfolio holdings and/or portfolio carbon analysis for the purpose of TCFD reporting. Due to the lack of transparency and confidence in GHG emissions data around Property and Hedge Funds, the analysis excludes these due to a lack of an appropriate public market proxy.

As shown in the table below, approximately 90.5% of the portfolio's assets in equity and credit are included within the emissions data. In addition, the sovereign bond's emission (relating to the Scheme's LDI portfolio) are reported on separately.

We recognise this does not cover all of the portfolio's assets as disclosed and that this coverage level is a limitation when disclosing our emissions data. We note that the majority of public market equity issuing companies are already being covered and that the credit issuing company analysis is still developing.

5.4. Metrics

5.4.1. The metrics we have calculated

We calculate and disclose the following metrics:

Metric	Detail
Absolute financed emissions	Our absolute emissions for GHG Scope 1 and 2 are 17,682 tCO2e. This is the total greenhouse gas (GHG) emissions, in CO2 equivalent, of the portfolio. This is based on public market proxies where the manager does not provide data.
Carbon Footprint	Our emissions intensity for GHG Scope 1 and 2 is 51.5 tCO2e per £1m invested. This is based on public market proxies where the manager does not provide data.
Data quality (as shown as % coverage)	The proportion of the analysis for which there is high quality emissions data is 90.5%. We will work with Cardano and the asset managers to engage

	companies, policy makers and data providers to improve data quality and coverage
SBTi alignment metric	Our estimated alignment is 14.8% of the portfolio. This is the percentage of the portfolio exposure having set Science Based Targets to align with either a 1.5 degree or 2 degree climate scenario. We use the Science-Based Targets Initiative (SBTi) framework which assesses the ambition of a company's Scope 1 and 2 targets. This is based on public market proxies where the manager does not provide data.

Emissions associated with our direct financed exposure

Asset class	% exposure financed	% coverage	reported %	estimated %	Absolute Financed Emissions tCO2e		Carbon Footprint: Emissions intensity tCO2e/£m invested	
					Scope 1+2	Scope 3	Scope 1+2	Scope 3
Equity	15.6%	99.5%	80%	20%	3,569	42,239	32.2	381.5
Private Equity	11.6%	90.0%	0%	100%	2,415	58,084	29.2	702.6
Credit	21.1%	84.2%	100%	0%	11,697	102,181	78.1	682.2
Total	**48.3%**	**90.5%**	**69%**	**31%**	**17,682**	**202,504**	**51.5**	**590.1**

Source: Cardano. Data represents exposure and fund holding data as at 31/12/2024. Managers captured: Barings, Wellington, Cardano, Crake, Dorsal, Egerton, Kadensa, Polar, Sunriver, Towers Watson SIF. Overlays positions not included. Scope 3 include both upstream and downstream emissions (compared to 2023 where only upstream was included). Scope 1+2 emissions have reduced compared to last year as IG Credit funds, Equity fund, Barings and Egerton have fallen and WTW SIF emissions were proxied in this year's report (last year these were based on manager response)

Interpreting the results:

Absolute emissions tell us the emissions associated with our investments. While an important metric for us – and the regulator – it is difficult to use this metric for comparison purposes, because it is dependent on the size of the Scheme at the point we conduct the analysis.

This is why, we disclose an emissions intensity metric, which is the total GHG emissions per £1m invested. This is useful, because, while subject to market fluctuations, it allows us to compare our emissions year-on-year and help us check we are moving in the direction of achieving our targets. For example, both the absolute emissions and emissions intensity should trend to zero if we're to meet our Net Zero target.

Note that, while we expect our emissions intensity to trend to zero, different regions will have different pathways. For example, some emerging markets may see emissions rise, before they fall. When we make investment decisions we take into account the emissions, the climate change-related risks and opportunities, the asset managers' stewardship activities, and the sectoral and regional characteristics of the portfolio.

Due to the lack of established methodologies and/or data quality issues, not all the investments have been included in the analysis. This includes the Scheme's investments in Hedge Funds (Aspect Core, BlackRock, Caxton, Lynx 1.5, Ruffer, Two Sigma and Towes Watson DSF).

In order to advance GHG emissions disclosures and methodologies and improve the range of assets included within TCFD analysis for pension funds, such as the Scheme, Cardano is participating in a range of sustainable investment working groups.

We report sovereign bonds' carbon footprint separately from this measure for several reasons:

- There is no comparable measure for sovereign bonds to financed EVIC (because countries' debt levels are not comparable)
- Total Sovereign country greenhouse gas emissions involve substantial double counting of emissions with corporate greenhouse gas emissions, and
- We believe adding sovereign numbers to corporate numbers can substantially obscure the dynamics of monitoring the changes to the corporate Portfolio Carbon footprint over time. Our preferred approach to Sovereign Carbon Footprint is to consider weighted average GHG emissions per Capita which we record and report separately below.

Our preferred approach to Sovereign emissions is to use a metric that is as close to and consistent with an emissions intensity metric. We use the weighted average consumption based GHG emissions per capita and per GDP-PPP which we record and report separately below.

For the Scheme's Sovereign bond exposure, we calculate and disclose the following metrics:

- **Production emissions**: Sovereign emissions data represents Scope 1 domestic territorial emissions, including emissions from exported goods and services. Emissions data includes land use, land use change and forestry
- **Consumption emissions**: Sovereign emissions data represents Scope 1, 2 and 3 domestic territorial emissions, excluding emissions from exported goods and services. Emissions data includes land use, land use change and forestry.
- **£ PPP-adjusted GDP**: PPP (Purchasing Power Parity)-adjusted GDP provides a more accurate comparison of economic output across countries by accounting for differences in local price levels and living costs. Data sourced from MSCI

LDI Value (£m)	Portion of fund that is reportable	Coverage	Total Carbon Emissions (tCO2e)		Carbon Footprint (tCO2e/£m PPP adjusted GDP)	
			Production emissions	Consumption emissions	Production emissions	Consumption emissions
279.6	100%	100.0%	88,349	122,612	120.6	167.3

Source: LDI manager. Notes: Data represents exposure and fund holding data as at 31/12/2024 .Total production & consumption carbon emissions calculated for funded Gilt exposure; TRS and interest rate swaps are proxied using the underlying Gilt exposure. The analysis excludes cash and money market funds due to the lack of a suitable industry methodology for incorporating these into the metrics

5.5. Targets

5.5.1. The target we have set in relation to the metrics we have calculated, and as far as you are able, your scheme's performance against that target

The Trustee has set the following principal target with respect to the Scheme:

- To align our investments to support the goal of net zero greenhouse gas emissions by 2050, in line with global efforts to limit warming to 1.5°C.

Specifically, we commit to:

- Work in partnership with other asset owners on decarbonisation goals, consistent with an ambition to reach net zero emissions by 2050 or sooner.
- An interim target for 2030, consistent with a fair share of the 50% global reduction in greenhouse gases, identified as a requirement in the IPCC special report on global warming of 1.5°C[9], based on 2022 levels.
- Review the progress against our target every year, and to review the target itself at least every three years, to ensure it remains consistent with the latest scientific thinking and is appropriately incentivising the necessary economic transition.

The portfolio emissions intensity will be measured against these targets and relative to the appropriate market portfolio representative of the strategic asset allocation of the portfolio.

Our objective is to achieve, where possible, decarbonisation through the transformation of underlying businesses and government activities rather than divestment (because it is in our members' interests to decarbonise the economy-as-a-whole, and by remaining invested we retain our influence on the companies that must transition).

With regards to corporate assets' alignment with the Paris Climate Agreement, the target over time is to consistently increase the proportion of the corporate portfolio that is Net Zero, Aligned to Net Zero or Aligning to Net Zero until 100% of the portfolio is aligned.

We will resist pressure to modify portfolios to meet headline portfolio level decarbonisation targets at the expense of incentivising the necessary real-world transition. Our goal is net zero greenhouse gas emissions globally – and we seek to maximise our influence to achieve this.

For these reasons, portfolio decarbonisation targets will continue to be reviewed at least every three years to ensure they remain appropriate.

[9] https://www.ipcc.ch/reports/

Net Zero Pathway analysis

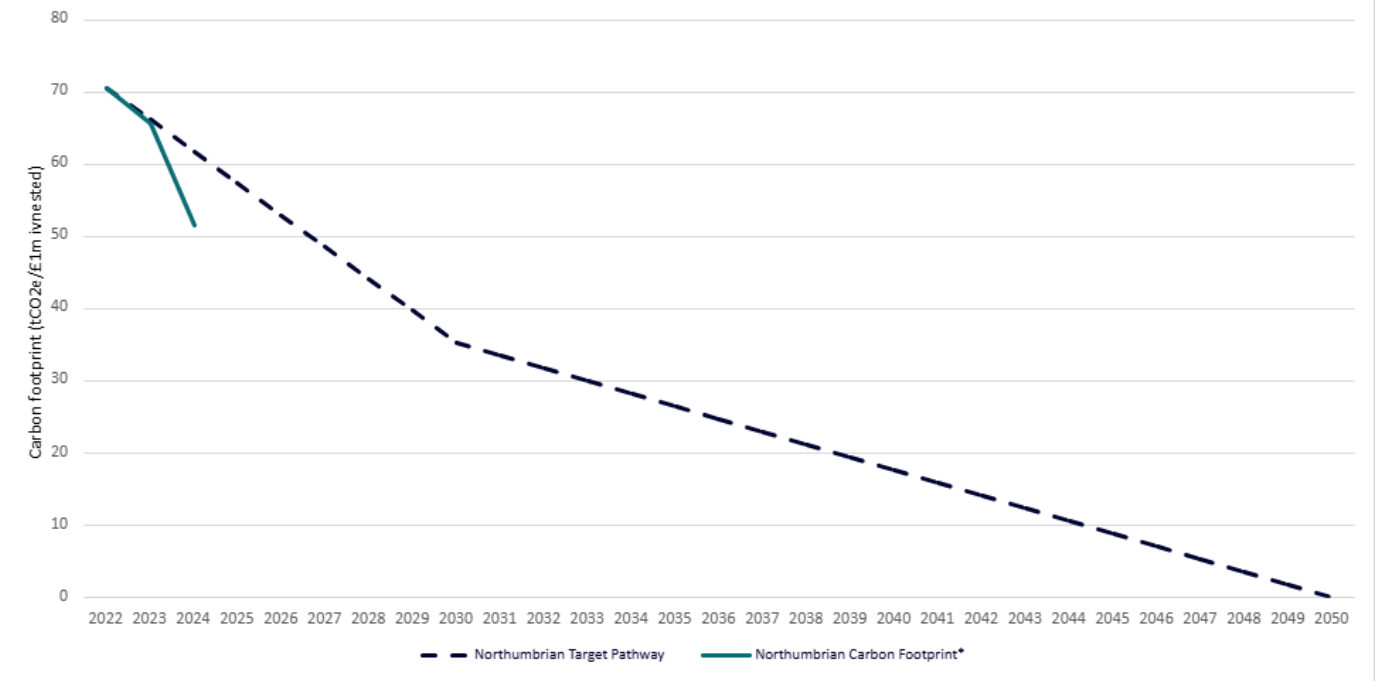
Notes:

The Scheme's Carbon Footprint emissions target uses an emissions intensity metric, which is the total GHG emissions per £1m invested. This is useful, because, while subject to market fluctuations, it allows us to compare our emissions year-on-year and help us check we are moving in the direction of achieving our targets.

- Both the absolute emissions and emissions intensity should trend to 0 net greenhouse gas emissions (not adding greenhouse gases to the atmosphere) if we're to meet our Net Zero target by 2050
- Fully assessing progress of the portfolio towards Net Zero will still take some time. Data is limited in some asset classes so we will continue to first focus on where we have the greatest insight and can have most influence.

Chart 1:

Net Zero Pathway



*Source: Cardano & WTW. * Baseline carbon footprint sourced from Northumbrian's 2022 TCFD report and converted to GBP using USD to GBP conversion rate as at 30/06/2022*

Interpreting the chart:

1. The NuW target pathway comprises of three key data points: Our estimated emissions as of 2022 (base year used for this analysis), our 50% emissions reduction target by 2030, and our 100% emissions reduction target by 2050.
2. The NuW Carbon Footprint focuses on Scope 1 and 2 emissions. This will be updated annually

- We will monitor divergence between the NuW carbon footprint and the NuW projection to understand whether we are on track to meet our target.

Conclusions

- As at 31 December 2024, the Scheme is tracking ahead of target
  - As at 31 December 2023, the Scheme's greenhouse gas emissions per £1m invested was 65.6 tCO2e for Scopes 1 and 2
  - As at 31 December 2024, the Scheme's greenhouse gas emissions per £1m invested was 51.5 tCO2e for Scopes 1 and 2
- 2024 emissions have reduced compared to last year as:
  - IG Credit funds, Equity fund, Barings and Egerton emissions have fallen
  - 2023 emissions for WTW Secure Income Fund were based on manager response, as opposed to this year where these have been proxied
  - The above account for a combined allocation of c. 85% of funds captured in the analysis
- In addition we are acutely aware that managers' and investment advisors' methodologies can vary and whilst we encourage our managers to follow best practices and complete industry standard templates, there is a limit to the extent we can practically vet the data provided
- For Managers that failed to provide analysis, appropriate proxies were used but these may not perfectly represent the strategy and/or companies held within the Funds

5.5.2. The steps we are taking to achieve our target

Our OCIO has committed to:

- Provide us with information, metrics and analytics on net zero greenhouse emissions by 2050 investing and climate change-related risks and opportunities.
- Engage with those key to the investment system including data and service providers to ensure that products and services available to the Trustee are consistent with the aim of achieving global Net Zero emissions by 2050 or sooner.
- Ensure any relevant direct and indirect policy engagement is undertaken in support of achieving global net zero greenhouse gas emissions by 2050 or sooner.

We will:

- Take account of and report on progress against Scope 1 and 2 emissions and, to the extent possible, material portfolio Scope 3 emissions.
- Prioritise the achievement of real economy emissions reductions within the sectors and companies in which we invest.
- Use the reporting provided by our Investment Adviser to help us assess progress towards our targets.
- Whilst we expect our portfolio to trend towards our 50% emissions reduction target by 2030, we'll take the decisions necessary to align the portfolio consistent with our net zero emissions by 2050 goal.

5.5.3. The method we used to measure performance against our target

In order to help us track progress against our target of net zero greenhouse gas emissions by 2050, our OCIO will, at least annually, report to us:

- Our portfolio's absolute GHG emissions
- Our portfolio's emissions intensity

5.4.4 Prioritising real-world Outcomes over portfolio-level targets

While we measure our carbon footprint to track the progress of the portfolios and the real world decarbonisation over time, and we have set headline decarbonisation targets, this is not what we believe should drive portfolio change. Instead, we would consider shifting our focus to alignment metrics, such as the proportion of the portfolio that have set Science Based Targets. We will resist pressure to modify portfolios to meet headline portfolio level decarbonisation targets at the expense of incentivising the necessary real-world transition. Our goal is to be aligned with the successful shift to net zero greenhouse gas emissions globally – and we seek to maximise our influence to support this. In the long-term, this is the only effective strategy to mitigate the systemic effects on markets of climate change. For these reasons, portfolio decarbonisation targets will continue to be reviewed every few years to ensure they remain appropriate and aligned to the achievement of the Trust's fiduciary objectives.

6. Appendix – Climate Scenario Analysis

Approach to developing the scenarios

Global warming is currently at 1.1 degrees above pre-industrial levels. Given that human related GHG emissions will continue to accumulate in the atmosphere at a substantial pace over the next 7 years *regardless of action to decrease emissions*, the trajectory of climate change over this medium-term period is very similar in all three scenarios - i.e. whether we are ultimately on a +1.5, +2 or +3 degree pathway, we expect that we will continue to experience more and more extreme weather over the coming years. However random variation can lead to substantial variations in actual impacts of weather from year to year around the scenario path. For this reason, we assume similar actual weather outcomes in the +1.5 and +2 degree scenarios and more severe fluctuations and impacts under the +3 degree scenario. This leads to greater physical and economic impacts in the +3 degree scenario.

Under both a +1.5 and +2 degree scenario, we invite you to imagine that the following weather scenario might unfold[10]: Over the next 6 years, the world witnesses a series of increasingly severe weather events. 2024 was the warmest year on record breaching the 1.5 degree limit for the first time in part due to the "El Niño" effect. Despite the transition to La Niña in 2025 we are seeing record weather effects, with the LA fires causing unprecedented property damage and flash floods in Valencia claiming over 220 lives. Globally this pattern continues in the coming years with new challenges: droughts, wildfires and heatwaves in certain regions, ; flooding, and agricultural disruptions in other regions, especially some emerging markets. By 2028, intensifying tropical storms, including hurricanes and cyclones, wreak substantial damage in the US and Asia, while India suffers from an unprecedented heatwave. Meanwhile, Europe experiences milder winters and longer growing seasons. In 2030, the world grapples with unprecedented wildfires, severe flooding in coastal regions, and prolonged droughts in Western Africa. In addition, the Arctic experiences record-low sea ice, highlighting the urgent need for comprehensive climate action amidst escalating environmental fragility.

We assume that in the +3 degree scenario, a very similar overall climate set of outcomes but that weather is more concentrated: that some of these weather impacts, by chance happen back-to-back and happen in particularly impactful regions for the global economy and global food production, compared to a more fortunate spread of outcomes in the other two scenarios.

The government policy responses, economic outcomes and consumer response to climate change over time vary across the three scenarios leading to different outcomes for markets and portfolios over this medium term time horizon.

1.5 Degrees

Scenario outline

Unfortunately, this scenario seems increasingly unlikely because of disparate policy adopted across major economies and in particular the US stepping back from its role in the climate transition. A grass roots consumer led revolution and reaction triggered by extreme weather events and an increasing lack of insurability causes growing global pressure for action. Society responds through their spending behaviour, political activism and voting in favour of climate friendly politicians at mid term elections. China emerges as the unlikely leader on climate issues pushing for consensus to tackle climate change more quickly despite a lack of US involvement. Governments including the EU and UK respond as they recognise the changing public attitude and large economic appetite for the green transition. Despite a lack of US leadership, geo-political alignment emerges from the COP process, with countries agreeing coordinated

[10] This weather scenario is loosely adopted from the USS/Exeter University paper “No Time to Lose” which gives a much more comprehensive description of such a scenario and adopts a similar approach to that outlined here.

initiatives to meet global targets. Supportive policies come into effect to target aggressive Net Zero implementation and climate adaptation. Tax revenues from carbon and resource intensive consumption and public investment is used to support and fund greener alternatives, resilient infrastructure programs and accelerate efforts to catch-up with China's leading renewables programme.

Physical Risk – Moderate

Each year across the globe, different regions are affected by extreme weather events that result in destruction of property, flood damage, and disruption to transport and industry. Sea level rises impact coastal areas with more severe storm damage. In other areas extreme heat waves, drought and water shortages cause modest disruption to regular economic activity. The effects are felt by both business and consumers. Both developed and developing countries experience droughts and changing rainfall patterns which disrupt crop yield and livestock production in some years impacting crop yields leading to temporary food shortages and price spikes in essential commodities and inflation. Insurance losses mount. Portfolio effects are felt through the impacts on the physical locations and supply chains of businesses and consumer demand.

Strong investment in flood defenses infrastructure and other infrastructure leads to mitigation of some of these effects in this scenario. In addition, alternative solutions are implemented to support essential food, energy and climate adaptation and most areas remain covered by insurance with the exception of some coastal areas and fire risk areas that are over exposed. After several years, the aggressive Net Zero initiatives start to slow the pace of increases to atmospheric green-house gases, meaning the more extreme environmental tipping points are likely to be avoided.

Transitional Risk – High

Governments introduce intense green taxation policies on carbon-intensive industries and Carbon Border Adjustment mechanisms tax imports. Reputational risks weigh on companies failing to transition to a greener economy and they are publicly held to account as consumers switch to cleaner alternatives. Carbon pricing significantly increases, putting a large revenue strain on those heavily reliant on fossil fuels and companies are forced to quickly invest in green technology to improve their carbon footprint. Stranded asset risk is high, particularly in fossil fuel industries. Conversely companies with technology and intellectual property that provide solutions benefit from the substantial positive investment in scaling up solutions, offsetting some of the transitional risks.

Systemic Risk – Moderate

Public policy leads to positive robust growth as public and private innovation and investment increases. Revenues from green taxation are directed into green investment and infrastructure, boosting economic growth. Interest rates increase modestly as investments produce strong returns and inflation rises modestly with booming demand for new capital stock but strong productivity growth. Carbon pricing systems provide financial transition support to labour from now-stranded carbon-intensive industries, limiting downside risk. Developing markets receive large funding support following COP agreements and their economies are boosted, accompanied by high inflation, as they emerge as major exporters of solar-based fuels and climate friendly agriculture.

Portfolio Impact – Positive

Overall, the portfolio and funding ratio would most likely benefit, as strong economic growth from accelerated public and private investment offsets some of the negative transitional and physical risks leading to positive overall returns from growth assets.

The high transitional and physical risks create greater dispersion between "winners" and "losers": the

former being companies and countries which are well prepared for and able to contribute to a greener world or with strong adaptation polices, and infrastructure related businesses benefit; and the latter being companies that are negatively affected by increased taxation/carbon pricing policies, and with stranded fossil fuel assets. Businesses with supply chains in higher risk physical locations are still affected, especially those which are highly indebted. In this scenario, countries with strong reliance on fossil fuel export revenues (and high costs of production) are likely to be most negatively impacted, including Canada, the US and some middle eastern countries. The UK is negatively affected as expensive North Sea oil and gas production becomes stranded. The US is least affected due to its diversified economy. Countries more reliant on fossil fuel imports and transitioning quickly to renewables benefit including China and the broader emerging markets.

While growth assets do well in this scenario, liabilities are well hedged. On the back of strong growth, real rates increase modestly reducing liability values in this scenario despite higher inflation but these are matched by modest losses on LDI hedges. The unhedged deficit shrinks.

2.0 Degrees

Scenario outline

Our new expectations for global warming following the events of 2024. Geo-political fragmentation and climate denialism delay action to fight global warming. Global co-operation on Net Zero efforts is stymied as politicians and media channels focus on living standards and energy security. Through the decade, extreme weather damage leads to consumer and investor pressure to act on climate change but progress is patchy and erratic.

Some countries in Europe persevere with their Net Zero goals, investing in greener technology, but growth is limited with supply-chain issues. Climate policies are initially local and patchy but mounting pressure through the decade leads to the return of and support for politicians who target climate action. Finance flows towards affected emerging markets for loss and damage and eventually the developed world succeeds in persuading China to join forces.

Physical Risk - Moderate **increasing to high**

Similar to the 1.5 degree scenario: Each year across the globe, different regions are affected by extreme weather events that result in destruction of property, flood damage, and disruption to transport and industry. Sea level rises impact coastal areas with more severe storm damage. In other areas, extreme heat waves, drought and water shortages cause modest disruption to regular economic activity. The effects are felt by both business and consumers. Both developed and developing countries experience prolonged droughts and changing rainfall patterns which disrupt crop yield and livestock production in some years impacting crop yields leading to food shortages and temporary price spikes in essential commodities and inflation. Insurance losses mount and insurance is increasingly withdrawn from multiple areas leading to falls in property values and wealth. Portfolio effects are felt through the impacts on the physical locations and supply chains of businesses and consumer demand.

The growing frequency and intensity through the decade of extreme weather gradually pushes climate focus up government agendas. However, the mitigating effects of climate adaptation measures are more limited. Limited investment in infrastructure driven by budget constraints and the slow rollout of such measures mean greater losses are absorbed by portfolio exposures. State governments increasingly take on the role of insurer of last resort as areas become uninsurable pushing up credit risks..

In emerging markets, where weather shocks and crop failures are worst felt, economic and political instability increases and supply chains are impacted.

Transitional Risk – Low increasing to Moderate

With the new US administration and global political fragmentation, short-term transition risks have temporarily decreased. Over the next few years, governments and businesses operate under loose initiatives to tackle climate change with limited taxation. Some companies recognise the appetite for greener technology and continue on their paths to Net Zero where there is a clear financial reward, posting positive growth. Pressure from consumers, society and investors start to slowly build through the decade as the effects of global warming are strongly felt. Society becomes increasingly more supportive of businesses on following a Net Zero path and consumers shift away from companies with poor reputations. Later through the decade, the shift to greener companies starts to emerge and strong climate policies come into force, first in Europe, to mitigate the damage from delayed action.

Systemic Risk – Moderate

The return to normality in inflation leads to a decline in interest rates and a surge in economic growth over the next few years which sparks an upturn in lending and investment in proven tech opportunities, creating a tech-led boost in equity markets. Businesses manage to navigate the complex political landscape but eventually, material shortages emerge and the next few years are followed by bouts of renewed inflation, exacerbated by weather-related spikes in food prices.

Subsequently, the burst in growth and rising inflation prompt central banks to raise interest rates again. After a slowdown, policy makers are forced to step in with renewed monetary stimulus and fiscal responses though these are limited by budget deficits and debt levels resulting in anemic growth over the remainder of the decade.

Portfolio Impact – Moderate

Over the short-term, the portfolio is expected to benefit from an initial growth environment led by the technology industry. The majority of growth assets (e.g., equity, credit and private markets) benefit from the boom and the portfolio holds up well.

But, over the longer-term, companies and sovereigns post flat or negative growth with more limited investment and fiscal spending means returns are likely to be volatile. As climate taxation comes into force, the portfolio may need to transition to assets which are making good progress in green tech and benefiting from increased investment and away from highly indebted positions.

On the liability side, the impact on interest rates and inflation is uncertain. However, the liability hedging approach should protect the portfolio which-ever the outcome.

3.0 Degrees

Scenario outline

Geopolitical conflict and division detract from global efforts in climate policy. Tensions across the world, particularly between China and the US, and US domestic political deadlock slow global decarbonisation efforts and technological progress. Diminishing trust between nations undermines any hopes of Net Zero collaboration through COP. Initially we see low levels of government and consumer intervention and climate policies shift to local efforts, not global, with many countries failing to meet their Net Zero commitments.

Private investment continues to accelerate but well below the levels required to create massive scale in the implementation of affordable green technology. The unfortunate back-to-back experience of extreme weather over several years impacts multiple food basins, reducing crop productivity and food availability

and generating sustained high inflation. Climate protests gain little traction as extreme weather events compound political and economic problems and result in social instability where food and energy security take precedence. Inequality grows as masses are severely impacted by extreme weather conditions and rising prices of scarce resources drives the wedge further.

Physical Risk – High

An unlucky combination of back-to-back weather occurrences over two years lead to simultaneous droughts and severe storms across the world. Droughts affect several major crop producing regions, disrupting crop yield and livestock production, while water shortages and the extreme heat waves affect tourism in some regions. The demand for resources and successive years of major crop failures drives up prices globally. Electricity supply in some regions is disrupted and economic productivity is impacted negatively. In other regions, the more severe storm seasons create particularly large losses for insurers through flood and storm damage. This results in more severe destruction of property, flood damage, and disruption to transport and industry. Sea level rises impact coastal areas with more severe storm damage. All of these effects contribute to increased healthcare costs for individuals affected.

Portfolio effects are felt to a greater degree than in other scenarios through the impacts on the physical locations and supply chains of businesses and consumer demand.

Property, businesses and critical infrastructures are severely damaged in several countries requiring increased funding support from governments who are already experiencing budgetary pressures, diverting funds from investment and productive growth. As we progress through the decade, commercial property insurance is retracted from many areas subject to high acute physical risk and insurance losses lead to substantially higher premiums and falls in property values. Investors also become acutely aware of the location of production facilities and supply chains for specific businesses, increasing risks across affected sectors.

As the decade closes, scientists become increasingly concerned that the world is on track to exceeding several climate tipping points. This leads to greater discounting of physical risks in asset prices.

Transitional Risk – Initially moderate, but increasingly uncertain

The lack of climate policies and green taxation puts less initial strain on companies to transition to a greener world. Investment in renewable development is modest with businesses focusing more on continuing their operations as normal. Political attention is focused on keeping prices as low as possible, rather than diverting activity away from damaging fossil fuel practices. However, the extreme weather events lead to increased political pressure and different countries adopt uncoordinated approaches. These sudden swings in policy create heightened uncertainty for investors, driving up risk premia in companies with high emissions.

Systemic Risk – High

Productivity is negatively impacted while inflation remains stubbornly high. Poor market environments stem from political, economic and financial turmoil, which further disrupt trade flow and supply chains. This reduces productivity growth and raises inflation and interest rates. Geopolitical tensions rise and divergent policy responses create uncertainty and increasing risk premia. Financial markets are increasingly volatile in the face of food shortages, recessions and political instability and unemployment runs high. Banks and governments are hit by huge losses on corporate and sovereign failures which fall back on state support. Emerging markets suffer from weak economic activity, limited trade and the failure of developed markets to provide financial support. China benefits from its dominance in renewables and access to materials but its exports are damped by weak global growth.

Portfolio Impact – Negative

Overall, the portfolio is negatively affected with lower transition risks more than offset by higher physical and systemic risks. Growth assets would struggle from the rising physical risk and low productivity, and company revenues would be directed to recovering against harsh weather conditions as insurance policies are pulled. High interest rates and persistent inflation make it difficult to finance new investment. Many regions would be severely hit, particularly emerging markets, and the portfolio would struggle to deliver positive returns.

It's likely the strategy would need to be revisited to focus on assets and countries which are more resilient to climate change and which benefit from the increased demand of natural resources and need for renewable technology. Fossil fuel assets, while initially benefiting from a slower transition, in the longer term would be subject to increasing risk premia from erratic government responses and lurches in policy. The portfolio would need to focus more on assets that provide inflation protection including against volatile food and agricultural prices, and on stocks that can contribute strongly to climate adaptation such as infrastructure investment.

On the liability side, high short-term interest rates lead to inverted yield curves and the combination of lower levels of real interest rates with higher inflation risk premia may mean higher liability values. The LDI portfolio mitigates the risks of this through the use of hedging the funded assets, though the unfunded deficit grows.