BARNETT WADDINGHAM

Part of HOWDEN

Royal County of Berkshire Pension Fund

Climate scenario analysis report

as at 31 March 2025

Barnett Waddingham LLP

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Contents

Executive Summary

There is clear scientific evidence that human activities are causing climate change. The Royal County of Berkshire Pension Fund (the Fund) faces potential risks from both the physical effects of climate change and the transition to a low-carbon economy. Climate risk may manifest itself through many of the risks which the Fund already faces such as inflation risk and investment risk, which can potentially cause a deterioration in the Fund's funding position.

The purpose of this paper is to consider climate risk in the context of the Fund's 2025 actuarial valuation. This paper sets out climate scenario analysis on the assets and liabilities of the Fund based on the data and information received for the 2025 actuarial valuation.

The key features of this report are:

Climate risks

- For our analysis we have grouped climate risks into:
  - Physical climate risks
  - Transition climate risks
  - Other risks

Other risks

- Climate risk can manifest itself in several other risks that the Fund is already exposed to such as:
  - Employer Covenant risk
  - Investment risk
  - Inflation risk
  - Mortality risk
  - Legislative risk
  - Further un-quantifiable risks

Key Principles

- Agreed between the four actuarial firms, the Government Actuary's Department (GAD) and the Ministry of Housing, Communities and Local Government (MHCLG)
- Climate risk will feature more strongly as part of the Section 13 review of the 2025 valuations following feedback on the 2022 valuations.

Climate scenarios and key metrics

- The BW framework tests a "base scenario" and four climate scenarios ("delayed transition", "current policies", "fragmented world" and "late and inadequate").
- Based on the scenario testing, we are comfortable with the current level of risk included in our proposed funding assumptions

Introduction and background

This paper sets out climate scenario analysis on the assets and liabilities of the Fund in-line with the Key Principles drafted by the four actuarial firms who advise the LGPS funds and agreed with the Government Actuary's Department (GAD) for the purpose of the 2025 LGPS valuations in England and Wales. In producing this analysis, we have also considered the requirements under the Occupational Pension Schemes (Climate Change Governance and Reporting) Regulations 2021 however, these regulations do not apply to the LGPS. This is because we anticipate that the equivalent regulations that could ultimately apply to the LGPS, will contain similar requirements.

The purpose of this report is to present information to help Royal Borough of Windsor and Maidenhead, as the administering authority to the Fund, consider climate risk in the context of the Fund's 2025 actuarial valuation. This report also sets out measures the administering authority could take to manage climate risk.

The analysis focuses solely on climate related attributes and combines a mixture of qualitative and quantitative assessment, considering the Fund's investment strategy and other unique characteristics.

The results of the analysis will be used by the administering authority to consider the Fund's exposure to climate risks and opportunities. It may feed into the Fund's Task Force on Climate-related Financial Disclosures (TCFD) report, if and when required, and/or other climate reporting by the Fund.

The analysis considers the projected funding level under various climate-related scenarios, alongside the (proposed) 2025 valuation basis for the Fund. The results thereby allow the administering authority to consider whether the 2025 valuation funding strategy is sufficiently robust in the context of this climate scenario analysis and any potential contribution impacts.

The climate scenarios used are set out in the body of this report and relate to specific targets and global temperature changes, although we recommend these are taken as illustrative only. Qualitative commentary is included throughout to help provide context to the analysis, covering the impact on the Fund's assets, liabilities, and employer covenant.

This advice complies with Technical Actuarial Standard 100: General Actuarial Standards (TAS 100) and Technical Actuarial Standard 300: Pensions (TAS 300) as issued by the Financial Reporting Council (FRC).

Climate risks

For our analysis, we have grouped climate risks into the following three categories:

Physical climate risks

This is the direct risk associated with an increased global temperature. This may include acute physical risks (such as heatwaves, landslides, floods, wildfires and hurricanes) and chronic physical risks (such as rising sea levels, changes in precipitation and more volatile weather events). These risks may put an invested asset (or an asset of an underlying company) directly at risk of damage; may cause disruption throughout supply chains and the global economy and/or may lead to higher costs on invested assets or underlying companies (such as insurance and litigation costs).

Transition climate risks

This is the risk associated with the transition to a low carbon economy. The main risk is assumed to be the potential impact of the enforcement of carbon taxes and policies (it is assumed that this risk is higher for regions and sectors with a higher level of, and hard to abate, emissions). However, other risks may include wider policy and regulation risk, technological risk, market risk, legal risk, and reputational risk.

Physical risks (examples)
• Droughts • Floods • Wildfires • Sea level rises • Loss of biodiversity

Transition risks (examples)
• Carbon tax • Constrains on consumption of natural resources • Policy changes in land use and farming practices • Impact on labour skills development

Other risks

As well as the above risks, there are additional risks that are difficult to quantify but should also be considered, for example litigation risk for the Fund or macro risks, such as migration and conflict that may have been caused by the social impacts of physical and transition risks. Additionally, many of the risks are interlinked, for example, political risk and transition risk. Further details are provided in the following pages.

Other risks

Climate risk can manifest itself in several other risks that the Fund is already exposed to such as:

Other risks		Current mitigation and potential actions
	**Employer covenant risk:** The impact on employer covenant is possibly the most immediate risk for most pension schemes, including the LGPS. The key risk being that if an employer is unable to meet their financial obligation the cost will fall to the other employers in the Fund. Different employers within the Fund are likely to be affected at different times and for different reasons due to their own individual characteristics. It may be appropriate for the Fund to factor in any concerns over particular employers as a result of climate change into the funding valuation. Inevitably, certain LGPS funds and employers are likely to be more at risk from these changes than others. For example, transport operators may have to evolve considerably to satisfy new net zero requirements. Other companies or employers, such as schools and leisure centres may be affected by supply chains if those are disrupted. Some areas are at greater risk of flooding and extreme weather events than others, affecting funds as a whole. Alternatively, local authority budgets may be affected by non-pensions issues surrounding climate change. This will all have an impact on covenant: how able and willing employers are to pay contributions to the Fund. The Fund should monitor the strength of the covenant of the participating employers over time, so that any sudden changes in any employer's position can be mitigated. The Fund could consider how they could factor climate risk into any employer covenant review.	The Fund could monitor the strength of the covenant of the participating employers as part of each actuarial valuation. The Fund could focus on physical climate risks which could lead to high costs for employers, as a result of insurance and litigation costs. It is now possible to factor climate considerations into employer covenant reviews as covenant rating agencies can factor it into their risk scores. However, if information is unavailable, the Fund may consider these risks by sector, as a proxy.
	**Investment risk:** For funding purposes, the discount rate used to value a Fund's liabilities reflects the expected return on the investments that the Fund holds (reduced by a margin for prudence). The Fund invests in a mix of assets (for example, equities). The price of these depends on the market outlook of how each company underlying the investments will perform in the future. To the extent that the market has anticipated the effect of climate risk on each company, it is already reflected within the discount rate. However, climate risk is complex and whilst it is easy to imagine the various ways that climate change could impact an energy company, for example, it becomes less clear with other companies (such as those in the service or	As part of the review of their Investment Strategy Statement, the Fund will consider how climate risks are allowed for in the Fund's investment strategy, using external investment advice as appropriate. The Fund's policy on environmental, social and governance (ESG) considerations,

Other risks		Current mitigation and potential actions
	healthcare sectors). If the market cannot anticipate or agree on the impact, then it is *unlikely* this will be correctly priced into today's market value or return expectation – in particular where investors' timeframes vary. Allowance is made in the funding assumptions for the expected long-term performance of risk-seeking asset classes such as equities, but an explicit allowance for climate risk has not yet been included. There is a risk that these returns will not be achieved in practice due to climate risk. Some funds already have a net zero pledge in place and / or seek to mitigate climate related risks. Therefore, both funding strategy and investment strategy need to be aligned to achieve this. The Fund should therefore regularly review the investment strategy specifically with regards to climate risk, to ensure the risks are understood and managed appropriately.	including climate change, is included in the Fund's Investment Strategy Statement. The Fund may wish to consider any opportunities as well as risks emerging from climate change and incorporate those into the investment strategy.
	**Inflation risk:** Inflation is another of our key valuation assumptions, with the majority of LGPS benefits increasing in line with the Consumer Prices Index (CPI) each year. No one knows for sure how inflation will move over the long term. However, we typically look to the bond market to gauge the market's expectations of this to set our assumption at each valuation. As is the case for the discount rate, however, if the inflationary impact of climate risk is not correctly being priced into the bonds in the market, then this will have a knock-on effect on our inflation assumption – the impact of which is, again, unknown. We have not made any additional adjustments to our inflation assumption with regards to climate risk. There is a risk that long-term inflation will be higher than assumed due to climate risk, which will increase the cost of providing the benefits. The Fund should therefore consider the inflation risk present within the Fund when reviewing the investment strategy.	The Fund periodically reviews the level of inflation risk inherent in the Fund's investment strategy as part of the review of their Investment Strategy Statement, using external investment advice as appropriate.
	**Mortality risk:** It is easy to see that climate change will influence how long we will all live, but it's more difficult to gauge exactly how. The list of implications of how it will affect the world is long (and growing) and includes risks like zoonotic pandemics such as Covid-19. But how much of that will impact on the life expectancy for members of UK pension schemes? How quickly will an effect be seen? And will it vary by location?	The Fund takes advice from their Fund Actuary on appropriate changes to the Fund's mortality assumptions. The Fund Actuary will seek advice from BW's specialist longevity team as required.

Other risks		Current mitigation and potential actions
	For example, it is possible that in the UK, longevity might actually improve due to climate change. If winters are milder in future, then that could mean fewer deaths. On the other hand, if our summers get too hot then that might not count for much. It is not possible to predict with certainty how long members of the Fund will live and, if members live longer than expected, additional contributions may be required to prevent a deterioration in the Fund's financial position. The Fund should therefore keep the mortality assumptions under review. We have been speaking with a number of climate data providers about quantifying mortality risks. The consensus is that it is not yet quantifiable at a decision-useful level, but strides are being made towards this. We are pleased by the developments in this space and will continue to monitor progress. In the meantime, we do not quantify it within our models.	
	**Legislative risk:** Changes in legislation could change the approach that the Fund has taken to managing climate change. Task Force on Climate-related Financial Disclosures (TCFD) is a framework that aims to help companies and investors measure, manage, and report their climate-related risk exposures and opportunities in a consistent manner. At the time of this report, we are still awaiting the consultation regarding the proposals for new requirements for assessing and reporting on climate risks in line with the recommendations of the TCFD and how they apply to the LGPS. Therefore, we have no new regulations or guidance to inform this analysis. However, we have agreed an approach with the Ministry of Housing, Communities and Local Government (MHCLG) to the 2025 actuarial valuations. Further to this, Funds face additional risks through the secondary effects of policies introduced by governments, potentially through their underlying investments. For example, the UK Emissions Trading Scheme (UK ETS) replaced the UK's participation in the European Union Emissions Trading Scheme (EU ETS) in 2021. This applies to energy intensive industries, the power generation sector and aviation. The legislation follows a 'cap and trade' approach to reducing emissions, where a cap is set on the total amount of greenhouse gases that can be emitted by the sectors covered. In November 2024, plans were announced regarding the expansion and strengthening of the UK ETS, including intentions to include the maritime sector.	The Fund receives regular updates on legislative matters from their external advisers.

Other risks		Current mitigation and potential actions
	These types of policies increase the cost of production, affecting businesses and consumers and may affect the investment returns received. The Fund should therefore take professional advice to ensure that they are aware of any changes in legislation and the impact of these changes on the Fund's funding position.	
	**Litigation risk** Risk of litigation regarding a challenge, for example, against the approach that the Fund has taken to managing climate change could create risks to the Fund (potentially causing both financial and reputational risks to the Fund). Further to this, Funds face additional risks through the secondary effects of litigation, potentially through their underlying investments. For example, a legal challenge against a firm's impact on the environment (potentially causing both financial and reputational risks to the underlying firm, or asset). Over recent years, there has been a significant increase in climate litigation, which has resulted in significant financial and reputational damage to firms. It is worth noting that litigation has not been one-sided, with challenges from both those who believe firms are going "to far", and those who believe firms aren't going "far enough".	The Fund receives regulated advice from their investment pool and other advisers and receives regular updates on legal matters from their advisers.
Further un-quantifiable risks		
	**Tipping points** Tipping points refer to thresholds in which, if passed, can cause sudden, dramatic or irreversible changes to the Earth, e.g. loss of forest in the Amazon Rainforest and ice sheet loss in the Antarctic. It is not possible to easily predict with certainty which tipping points could be reached, and when this would occur. Therefore, they are not currently accounted for in climate scenario analysis. Due to the interlinking of the Earth's ecosystems, the crossing of one tipping point could mean that many others are more likely to be crossed. Similarly to investment risk, the reaching of a tipping point is likely to have a direct impact on the market outlook of how each asset underlying the investments will perform in the future.	As part of the review of their Investment Strategy Statement, the Fund will consider how climate risks (including those risks that cannot yet be accurately quantified, such as tipping points) are allowed for in the Fund's investment strategy, using external investment advice as appropriate.

Other risks		Current mitigation and potential actions
	Whilst tipping points are a complex area and difficult to predict, the Fund should consider the risk of tipping points when reviewing the investment strategy, and ensure they are aware of notable changes in tipping points (for example, if an array of tipping points suddenly begun to be crossed).	
	**Political risk and geopolitical risk** Changing political environments can have an impact at a macro level. As countries deal with the impacts of climate change and the transition to a lower carbon economy, this is likely to have a direct impact on global carbon emissions and global temperature rises, as well as an indirect impact across many other factors. For example, the change in the way fossil fuels are utilised, as well as physical risk events, there is a possibility for increased pollution, conflict and disputes which pose the risk of mass-migration. Given that developing countries are expected to be more highly exposed to the risks associated with climate change, such migration could be expected to be from developing to developed countries (i.e. from the Global South to the Global North, such as USA, Canada and Europe). Whilst this is directly linked to the transition and physical risks detailed on page five, the Fund should ensure they are aware of these risks. Therefore, political and geopolitical risks are not currently allowed for in our climate scenario analysis and the potential impact of these changes on the underlying investments is not quantified.	As part of the review of their Investment Strategy Statement, the Fund will consider how climate risks (including those risks that are hard to anticipate and quantify, such as political and geopolitical risks) are allowed for in the Fund's investment strategy, using external investment advice as appropriate.
	**Planetary boundaries** Higher demand driven by the growth in global population means that we are running into, and in some cases have already breached, constraints determined by the limits of the Earth. For example, this includes the natural limits of the Earth, such as freshwater availability within a region. Stockholm University note nine planetary boundaries that we must remain within, or return to, for the global economy to remain sustainable. Six of these have thought to have been breached. It is clear from considering the planetary boundaries that sustainability issues cannot be considered in isolation as many of the boundaries are interlinked. For example, if we take an area such as climate change, significant long-term changes in the global climate may cause forest and other natural habitat loss. This may lead to a cycle of breaching planetary boundaries, as climate change can cause nature loss. However, it can also be considered in reverse as nature is a pivotal resource required in order to tackle climate change.	As part of the review of their Investment Strategy Statement, the Fund will consider how climate risks (including those risks that are hard to anticipate and quantify, such as the planetary boundaries being crossed) are allowed for in the Fund's investment strategy, using external investment advice as appropriate.

Key Principles

Barnett Waddingham has worked with GAD and the other actuarial firms to agree a set of Key Principles for how LGPS funds would undertake climate change scenario analysis as part of the 2025 valuations.

The Key Principles behind the climate scenario analysis have been agreed between the four actuarial firms, GAD and the Ministry of Housing, Communities and Local Government (MHCLG), to assist GAD in their Section 13 review of the LGPS funds. In their report dated August 2024, GAD noted:

"MHCLG has consulted on proposals for new requirements for assessing and reporting on climate risks in line with the recommendations of the Taskforce on Climate-related Financial Disclosures (TCFD) but has not yet responded to the consultation. Climate risk analysis is evolving rapidly and we anticipate a maturing in analysis for the 2025 valuations. The importance of climate risk analysis, and in particular the appropriate communication of risks relative to scenarios presented, was highlighted in the recent (June 2024) Institute and Faculty of Actuaries (IFoA) risk alert on climate change scenario analysis. We strongly promote the further development of climate risk analysis and its integration in decision-making by funds. We recommend that the SAB continue to work with stakeholders to refine the climate risk analysis principles document prior to the 2025 valuations."

At the time of this report, we are still awaiting the consultation regarding the proposals mentioned above.

The Key Principles are split into four areas:

Key Principles		Fund/BW action
1.	**Scope of the analysis** The scope was deliberately kept wide to reflect the various levels of that progress that different funds will have made on their journey in managing climate risk. Any analysis should be able to identify the impact of transition risk and physical risks on the potential funding outcomes. Any analysis should cover an appropriate spectrum of outcomes. The purpose of the analysis is to test whether the Fund's funding strategy is sufficiently prudent in the context of the scenario analysis considered and therefore any potential contribution impacts. The analysis should be supported by qualitative commentary on the financial risks under each scenario, as well as commentary on what potential actions are being taken to improve resilience to climate change and the potential implications.	The scenario analysis within this report separates the impact into transition risks and physical risks. This report comments on the suitability of the funding strategy. Qualitative commentary is included in the "Other risks" section.

Key Principles		Fund/BW action
2.	**Scenarios to be considered and "expected" funding level** As a minimum, each Fund should select at least two scenarios to consider covering a range of physical transition risk, including "Paris-aligned" and higher temperature outcome, and compare these to the funding basis. Funds should consider both the projected potential global average temperature rise, and the nature of the transition to that temperature risk. The detailed method and assumptions underpinning the climate change scenarios are not prescribed. As well as funds having different approaches, it is recognised that actuarial firms and GAD will have differing views on the methodology and assumptions underpinning different climate change scenarios. Funds should also consider the extent to which the scenarios will consider additional elements such as the potential impact on life expectancy changes and employer covenant.	The scenario analysis in this report looks at four scenarios. The "Paris-aligned" basis is referred to as our "delayed transition" scenario and the high temperature outcome is referred to as our "current policies" scenario. We do not include an orderly transition scenario as a "Paris-aligned" scenario, as we believe that this scenario is too optimistic as a risk scenario. The impact on the funding position of each scenario is then considered in the "Projected funding level" section of this report. Additional elements are described in the "Other risks" section.
3.	**Time horizon and output** The output from the scenario analysis will include consideration of the results (which will include the funding level on each scenario modelled) over a period of at least 20 years to ensure there is sufficient recognition of the transition and physical risks of climate change.	The scenario analysis looks at the impact on funding over a period of more than 20 years.
4.	**Reporting** A summary of the analysis should be included in the final valuation report. GAD will be looking to confirm that the two scenarios have been considered in a way that funds and other readers can understand. It may also need to be referenced in the Section 13 dashboard included in the final valuation report. Reference should be made to the challenges and limitations of scenario analysis. Details on the temperature alignment of the scenarios modelled and the timescales for transition should also be included. The commentary could include detail on what risks have been considered within the scenarios modelled and how the Fund has used the output of the scenario modelling in the valuation results.	BW will continue to engage with GAD on the 2025 reporting requirements to ensure consistency with the other LGPS funds. BW would also be happy to provide wording for inclusion in the FSS. We cover the key limitations and challenges of the analysis, as well as key scenario assumptions and risks within the report.

Key Principles		Fund/BW action
	The Fund's approach to managing climate risk in the valuation, should also be set out in the Funding Strategy Statement (FSS). The new FSS guidance issued in January 2025, includes a section on climate risk and details that it is expected that funds explicitly recognise and consider the funding issues and risks related to climate change. The Key Principles document is also referenced in the guidance. Under each of the scenarios included, detail on the temperature alignment of the scenarios modelled and the timescales for transition should be included.	Furthermore, the level of prudence has been considered relative to the climate scenarios.

Climate scenarios and key metrics

The climate scenarios within Barnett Waddingham's in-house climate scenario framework consists of a base scenario and three climate scenarios, which have been provided by Moody's Analytics and the climate scenarios are broadly based on scenarios from the Network for Greening the Financial System (NGFS) (further details of which can be found in Appendix 1). A brief description of these scenarios is set out in the table below.

Scenario	Brief description	Assumed temperature rise[1] by 2100	Approx. effective carbon price 2050 (per tonne)[4]	Physical risk[2]	Transition risk[2]
Base case	For this analysis, we have assumed the Fund's best estimate funding basis as the base case scenario. All other scenarios are considered relative to this base case, using the relative difference in returns and financial assumptions between Moody's own base case, and each climate scenario.	--	--	None	None
Delayed transition	Additional policy implementation is delayed until 2030. Stronger policies are required (versus a scenario whereby policy implementation is not delayed), such as a higher effective carbon price, in order to limit global temperature rises to below 2.0°c.	<2.0°C	c. $500	Limited	High
Current policies	No new climate policies are introduced beyond the current policies in place, resulting in a lower effective carbon price, but also a growing concentration of greenhouse gas emissions and a larger increase in global temperatures, relative to a transition scenario.	c.3.0°C	<$50	High	Limited
Fragmented world	Additional policy implementation is delayed and diverges globally. Those countries with net-zero targets are assumed to meet c.80% of their target, whilst those without follow current policies.	c.2.5°C	<$100	Medium	Medium

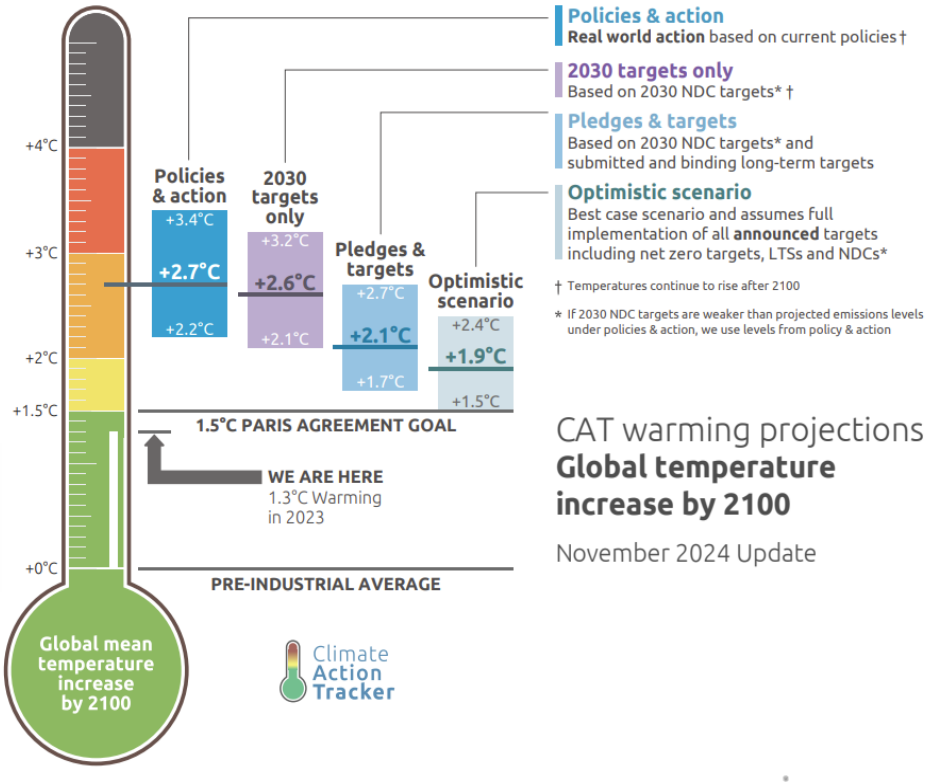
Late and inadequate action[3]	This scenario has been created by Barnett Waddingham, and takes the highest negative return impact, on an annual basis, across the other three scenarios. The scenario is assumed to exhibit a mixture of characteristics from the above scenarios (i.e. delayed transition and high temperature rises).	c.3.0°C	c.$500	High	High

[1]Relative to pre-industrial levels.
[2]Further details on physical and transition risks can be found in the 'Climate risks' section.
[3] Whilst the 'late and inadequate action' scenario does not explicitly split out physical and transition risks, nor does it have specific assumptions around temperature rise and / or carbon pricing, it is assumed that the scenario denotes a combined level of temperature rise and effective carbon pricing that are both high and, therefore, physical and transition risks that are high.
[4]Effective carbon price essentially bakes transition risk into one price. In reality, transition risk impacts would be felt wider than just through carbon pricing. Therefore, actual carbon pricing may be expected to be lower than what has been quoted. This one price method aims to simplify the risk exposures. As at April 2025, carbon pricing in the largest markets was in the region of $60-80.

We do not expect any one of these scenarios to play out exactly in full and actual experience will differ from that projected within the scenarios. However, these illustrations can be used as a guide to consider climate risk within the Fund's funding and investment strategy, thereby helping the Fund to monitor, manage and potentially mitigate specific risks.

The picture below shows how global temperature rises could change, based on national policies and pledges, giving context to the temperature rise considered under each scenario in this report.

The picture has been taken from the Climate Action Tracker (based on national polices and pledges at the end of November 2024).



Source: https://climateactiontracker.org/documents/1277/CAT_2024-11-14_GlobalUpdate_COP29.pdf

Analysis of the Fund's assets

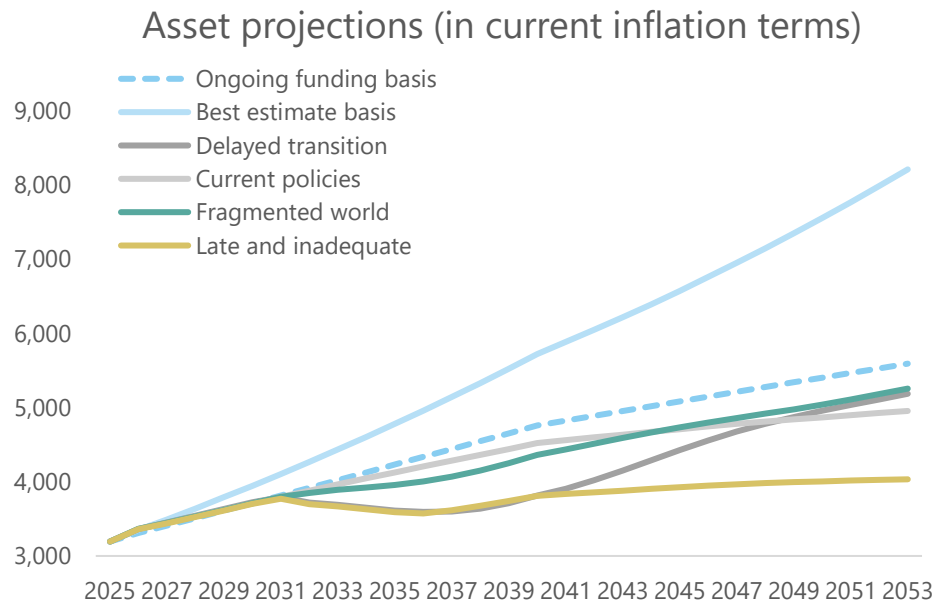
Using the Fund's long-term investment strategy, as provided to us for the 2025 valuation, we have assessed the climate risk impact under each of the scenarios set out above. The scenarios cover a range of outcomes, from global warming being limited to global temperatures increasing significantly. However, in reality, the risks may be significantly more material than implied within these scenarios.

All scenarios effectively consider the current market mispricing of assets and future returns. This may be the case for a vast number of reasons, for example, due to lack of climate risk data for investors, stranded assets, impact on yields through issuance of greater bond supply, or currency risk if not all countries adapt equally.

Barnett Waddingham's analysis looks at the impact of climate risk on each asset class over a 30-year period, and we have grouped the Fund's investment strategy into the same groupings used for the purpose of deriving the discount rate assumption used in the 2025 actuarial valuation. A breakdown of the asset projections by key asset types under each scenario has been included in Appendix 2, for more detail.

Asset projections

In the chart below we set out the projected level of assets under the different scenarios, in current inflation terms. In calculating these projections, we have assumed that the long-term investment strategy remains the same.



In the base case projection, the asset returns are aligned with our best estimate return assumptions for each asset class. Each of the other scenarios are considered relative to this scenario over the projection period. The difference between the projected assets on the best estimate basis and the ongoing funding basis is 1.3% and reflects the prudence allowance included in the ongoing funding return projection.

Asset returns in the "delayed transition" and "late and inadequate" scenarios drop sharply post-2030 as a result of increasing costs related to sudden and disorderly policies. However, this is expected to stabilise and eventually improve towards the end of the 2030s. Over the longer term, for the scenarios where action has been taken that is assumed to have been successful in limiting temperature rises (i.e. "delayed transition" and "fragmented world"), we see higher asset returns than other scenarios where temperature rises have not been contained. For example, temperature rises are not contained for the "late and inadequate" scenario.

Projected funding level

The Fund's liabilities are also subject to climate risks and opportunities. For example, inflation may increase due to resource constraints or decrease due to lower economic growth, life expectancies might be impacted by physical climate risks (e.g, drought, flooding, heat waves), or operational costs might increase due to changes in the supply and demand of certain resources.

In this section we consider the impact of the different scenarios on the Fund's overall funding position.

Conditions of analysis

Due to the current lack of robust data, no assumption has been made for potential climate change impacts on mortality in our scenario analysis. However, in our view, the impact of climate change on the life expectancies of UK pension scheme members is likely to be very long-term and unlikely to have a significant impact on the Fund's liabilities over the next 30 years. That is, over and above the current industry outlook for UK longevity. Therefore, we believe this omission is not material at present.

In our calculations we have used member data and asset data provided by the administering authority as part of the 2025 actuarial valuation. We checked the data for reasonableness as part of the valuation process and are happy that the data is sufficiently accurate for the purposes of this analysis.

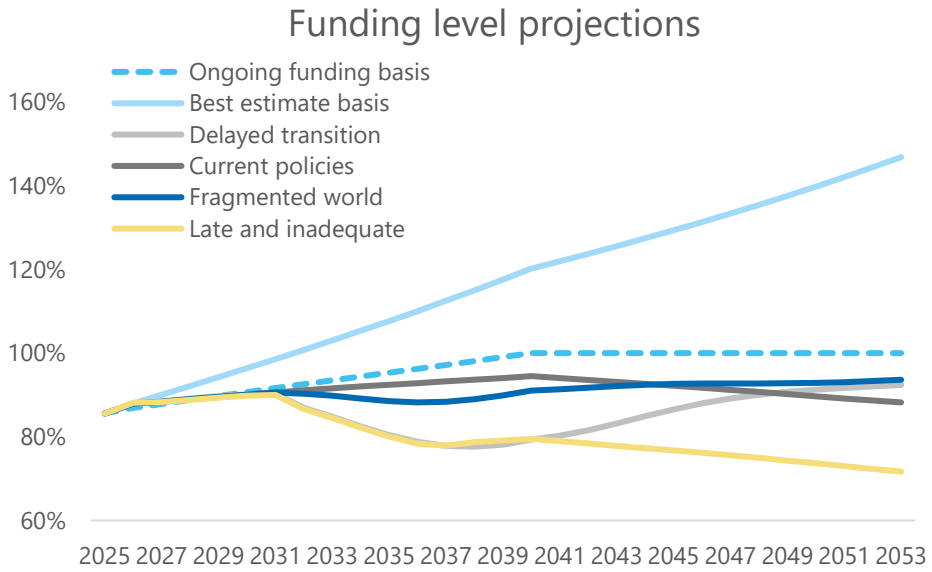
Liabilities have been projected using our current funding methodology, allowing for projected changes in market conditions over time.

Results

Funding level

In our funding model, both the discount rate and benefit increases are linked to the assumed level of inflation. Because of this, the more investments that the Fund has that are linked to inflation, the lower the impact of changes to the liability value. Therefore, with an increased exposure to inflation-linked assets, the projected value of liabilities is similar across all climate scenarios.

Combining the liability projections with the asset projections, the graph below shows how the Fund's funding level is expected to vary across the scenarios and time periods.



Over the short-term (1-7 years), the funding level across all climate scenarios are similar as each scenario assumes no further policy action in the short-term, although some level of physical risk remains (compared to the best estimate basis, which assumes no additional climate risk in the short-term and leads to higher projected funding levels). The funding level on the ongoing basis is similar to the climate scenarios over this period, the prudence adjustment allowed for in the funding basis is assumed to be similar in impact to the level of physical risk.

Looking at the medium-term (7-20 years), the funding level decreases sharply under a "late and inadequate" and a "delayed transition" scenario, which is a result of increasing costs of carbon tax related to sudden and disorderly policies. However, the funding level is expected to stabilise and eventually improve towards the end of this period. The funding level also begins to deteriorate under the "fragmented world" scenario, but this is less pronounced than the previous two scenarios due to the assumption that only some economies begin to take drastic action. As the transition risks take effect, the funding level on the ongoing scenario exceeds that of the various scenarios suggesting that the prudence adjustment may not be sufficient over the medium term.

Over the long-term (over 20 years), for the scenarios where action has been taken that is assumed to have been successful in limiting temperature rises (i.e. "delayed transition" and "fragmented world"), we see a continuing improvement in funding levels reflecting the lower risk of physical events. These begin to overtake the funding level shown in the "Current policies" scenario, where increasing occurrence of physical events account for lower returns continued into the long-term. For the "late and inadequate" scenario, temperature rises are not contained and we see lower returns into the long-term and no recovery in the funding level (without further contributions). The funding level on the ongoing funding basis remains higher than the other scenarios at the end of the projection period. However, scenarios "Delayed transition" and "Fragmented world" may overtake the ongoing funding basis if improvements continued. There remains a significant amount of uncertainty highlighted by the spread in funding levels over the projection period. We remain satisfied that the level of prudence in the ongoing funding basis is appropriate, however, recommend that this is kept under review.

The Fund may be able to reduce the impacts experienced on its funding level across each of the scenarios and time periods by considering the Fund's investment strategy and using this report in discussions with their investment advisers. As part of any such review, the Fund should consider the other risks and opportunities to which the Fund is exposed (as detailed earlier in the report).

Employer contributions

For our analysis we have assumed the same level of employer contributions are paid under each scenario at all terms. In reality, the contributions payable would be reviewed at each funding valuation and would be recalculated to recover any deficit present over an appropriate timeframe.

Where the projected funding level falls below the ongoing funding basis projection, either additional contributions would be required, or the length of the recovery period extended.

Our analysis suggests that funding levels may potentially fall over the medium-term in a transition to a low-carbon economy. In considering this risk to the Fund, the Fund may wish to consider the profile of any planned contribution rate changes.

Final comments

Climate risk is only one risk that the Fund faces. The prudence allowance in the discount rate used for the 2025 valuation is intended to act as a buffer against all downside risks, not just those relating to climate change. We do not see this analysis as the driver for setting the level of prudence in the funding assumptions, although it can be used to support any decisions on an appropriate level of prudence.

The Fund's funding level would be expected to vary under different climate scenarios. There is potential risk of lower funding levels in the medium term should strong policies be implemented world-wide to limit temperate rises, although we expect these will recover over the longer term should the policies deliver their intended outcomes.

Note that over the long-term, "Delayed transition" and "Fragmented world" scenarios result in funding levels that are approaching our ongoing funding basis projection. Given this we are comfortable with the current level of prudence included in our proposed funding assumption.

Consideration should be given to the funding policies used to calculate contributions paid by employers in the Fund to ensure the administering authority is comfortable with the level of risk being taken. For example, the risk of lower funding levels in the medium term should strong policies be implemented, could be used to support maintenance of contributions at a stable level and/or stepping any calculated reductions in contribution rates.

Next steps

Climate change and managing climate risk is becoming increasingly important. With draft regulations on the way, it is anticipated that it will become necessary for administering authorities to consider climate risk in relation to the Fund.

There are a number of actions set out in this paper which the Fund could consider in managing climate risk including:

- Different employers are likely to be affected by climate change in different ways, and at different times. The administering authority to stay alert to this and continuously monitor employer covenants to ensure that any changes in covenant are revealed and can be dealt with as soon as possible, to best protect the Fund and the other participating employers. The Fund may choose to review certain groups of employers as part of the way of considering climate risk.
- Consider climate risk in the Fund's approach to setting employer contribution rates. Our analysis suggests that investment returns may potentially fall over the short to medium term and therefore this risk to the Fund could be used to justify maintaining contributions at a stable level and/or stepping any reductions in contribution rates.
- The administering authority may also wish to consider the climate risk and opportunities of the Fund's assets and investment strategy. This should be discussed with the Fund's investment advisers.

- The Fund should take advice from their Fund Actuary on appropriate changes to the Fund's mortality assumptions at future valuations.
- The Fund should regularly monitor the funding position of the Fund (and of individual employers, particularly those susceptible to climate risk). This can be done in real-time using our funding projection software LGPS Monitor if required.
- The Fund should ensure they are in receipt of regular updates on legislative matters from their advisers.
- The Fund should update this analysis at the next triennial valuation taking into account current data and any comments from the Government Actuary following their review of the 2025 valuation process. This will also include a review of the appropriateness of this analysis.

We look forward to discussing this paper with you in more detail.

Barry McKay
Partner
Barnett Waddingham LLP

Appendix 1 Approach to climate scenario analysis

Overview

Barnett Waddingham's in-house climate scenario framework utilises data from Moody's Analytics to create three climate scenarios. The climate scenarios are based on scenarios from the Network for Greening the Financial System (NGFS), which have been produced in partnership with leading climate scientists and economists, and make use of climate economic models. Data is as at 31 March 2025. As per comments below, there has been significant improvements in the NGFS data over the past few years, with our previous analysis utilising an earlier version of NGFS data, through the Bank of England's Climate Biennial Exploratory Scenarios.

The data utilises a "top-down" approach (that is, at a macroeconomic level), rather than a "bottom-up" approach (at a company level). A bottom-up approach may provide for more granular results, however, given the quality and availability of data, the expectation that climate impacts will be systemic and the nature of UK pension scheme investments (that is, they are primarily invested in pooled funds with various underlying asset classes and numerous securities), a top-down approach was viewed as being more appropriate. Nevertheless, Barnett Waddingham's framework can incorporate a bottom-up approach at Fund level, by breaking down the Fund's long-term investment strategy.

Data provider

As noted above, for the purposes of our analysis in 2022, we used an earlier version of NGFS data, through the Bank of England's Climate Biennial Exploratory Scenarios. For the 2025 analysis, we felt this approach was no longer appropriate as the data was out of date. Therefore, we looked to find a climate data provider to enhance our analysis through the provision of improved data. We went through a thorough process to review a number of different third party climate data providers before we decided to use data from Moody's Analytics. We assessed the providers on a number of different measures including range of climate scenarios, range of assets classes and regions, time horizons, ability to reflect high risk scenarios and flexibility on service. Moody's scored highest based on our criteria.

Comparison to previous analysis

We carried out a similar analysis at the 2022 valuation dated 22 February 2023. We have made some amendments to our scenarios. In particular:

- The "delayed transition" and "current policies" scenario have similar narratives to the "late action" and "no additional action" scenarios previously used. Compared to "late action", the shock to funding levels in "delayed transition" from disorderly strong climate policies is smoother but is also longer lasting.
- The removal of the "early action" scenario reflects that since 2022 we have seen some countries rowing back their net zero policies and climate strategies (notably the US), and therefore this scenario is now less likely and less relevant.

- The addition of the "fragmented world" scenario considers a scenario where both transition and physical risks are present.
- As per the previous analysis ("too little too late"), we have created a fourth scenario ("late and inadequate") which considers other risks beyond those which are covered in the three Network for Greening the Financial System (NGFS) scenarios.

Despite improvements in the climate data, we continue to measure risk on a relative scale (rather than in absolute terms). The scenarios used at this valuation capture more climate risk rather than the climate risk being more substantial than three years ago. The most significant update has been a greater recognition of the long-term physical risks.

Our funding level analysis also assumes that the draft projected contributions from the 2025 valuation are maintained, whereas the previous analysis assumed that secondary contributions would be paid to restore the funding level to 100% over a rolling 20-year surplus amortisation period in each scenario. This leads to a greater range in funding level projections over the longer term.

Limitations

Our analysis does not consider the impact of climate change on mortality due to the current lack of data in this area. Nor does the data cover many of the 'other risks' covered earlier in this report. Furthermore, it is widely believed that climate scenarios fail to exhaustively model transition and physical risks.

Climate scenario modelling is in its infancy and is expected to undergo significant development over time. Furthermore, climate scenario data quality is generally considered spurious and non-comprehensive. As a result, we intend to develop and build upon this analysis over time as data quality and availability improves.

In creating this framework, Barnett Waddingham has recognised these limitations and aims to address them by creating a solution that combines quantitative and qualitative analysis. We have recently undertaken a full-scale review of our framework (including the data that feeds into our framework) and plan to undertake our next review in c.3 years, by which time we would expect a continued increase in the quality and coverage of climate scenario analysis forecasts and climate data. In the meantime, we continue to engage with modelling and data providers, as well as fund managers, regarding best practice and improvements to methodologies, data quality and coverage.

Key assumptions

Current market pricing

The data includes projected returns and yields across various asset classes up to 2055, under four scenarios – "base case", "delayed transition", "current policies", and "fragmented world". (Barnett Waddingham have also added an additional scenario "Late and inadequate action", which considers the largest risk impact across the other climate scenarios, on a year-by-year basis.) Moody's Analytics have their own unique methodologies with regards to translating climate data into economic data. Over the past few years, the underlying NGFS scenarios have also undergone significant updates to reflect new climate

science (such as refined effective carbon pricing). For example, there has been a material increase with regards to the impacts of physical risks on asset returns, which are expected to be in the region of 300% greater on certain asset classes, versus previous model iterations. Moody's update their scenarios when new NGFS scenarios are released.

Whilst it is impossible to estimate the future in terms of climate risks, given the continued lack of global consensus on net-zero, including by global governments, and the emergence of physical risks (faster than first predicted), we generally believe that we will experience both transition and physical risks, which may be partially illustrated by the fragmented world scenario.

Furthermore, it is very difficult to estimate the level of climate risk currently priced into markets. We have spoken to several modelling providers who have provided a range of answers. The general consensus is that the market is significantly underestimating the risks associated with climate change, as are the climate scenarios.

Exactly how much climate risk the market is pricing in at any one time is difficult to predict. Therefore, for our analysis, we have taken a pragmatic approach and, instead of trying to second guess the market, we have used the Fund's best estimate funding basis as our base case (i.e. equal to our best estimate of market assumptions for the 2025 valuation and excludes any prudence allowance). All other climate scenarios are then calculated relative to this base case, using the relative difference between each climate scenario and Moody's base scenario. Moody's 'base scenario' is sometimes referred to as a 'climate counterfactual' scenario, in that it doesn't explicitly price in any physical or transition climate risks. Its purpose is to serve as a means to compare the impacts of the other scenarios. The calibration of this scenario is aligned to Moody's Best Views (Real World) calibration, which is based on current market data (and historic trends). This means that the base scenario may be seen as somewhat 'optimistic' (given the absence of climate risks), but results in our risk measures being more prudent (as we consider downside risk relative to this scenario).

Projected employer contributions

Employer contributions comprise of primary contributions (covering the annual cost of accrual of benefits) and secondary contributions (as an adjustment to the primary rate as required i.e. payments towards any deficit that may exist). This enables us to consider the robustness of the proposed contribution strategy in each of the climate scenarios. While this does not reflect exactly what would happen in practice - in reality, the contributions would be recalibrated every three years in line with the Funding Strategy Statement - we consider this to be a reasonable approach given the contribution stability objective in the regulations.

Asset allocation

The Fund's assets are assumed to be invested in line with the strategic asset allocation used for the 2025 valuation, at all future dates. In practice, the strategic asset allocation should be reviewed on a regular basis, and it is unlikely this would remain constant over the next 30 years. Any changes to the asset allocation may affect the Fund's exposure to climate risk and therefore would alter our projections. Our analysis, therefore, only captures the risks projected under the current investment strategy as used for the 2025 valuation.

The strategic asset allocation (and best estimate returns for each asset class) is as follows:

Asset class	Strategic allocation	Neutral assumption (p.a.)
Gilts	1.5%	5.4%
Cash	1.0%	4.5%
Corporate bonds	12.5%	5.8%
Equities	50.0%	7.1%
Private equities	15.0%	7.1%
Property	7.5%	6.2%
Infrastructure	12.5%	6.7%
Weighted average assumed return after expenses		**6.6%**

Timeframes

The Fund's investment strategy has been assessed under each scenario across a 30-year time horizon.

Over the **short term** (i.e. 0-7 years), we would expect significant improvements in modelling and data quality with regards to climate scenario analysis. Furthermore, this represents the period before additional policy is implemented under a "delayed transition" scenario and, therefore, before return impacts are fully experienced.

Over the **medium term** (i.e. 7-20 years), we may expect the transition impacts of a "delayed transition" scenario to be experienced. This is expressed as a c.13-year range, as there is great uncertainty regarding the precise timing and magnitude of any "delayed action".

Over the **longer term** (i.e. 20+ years), under transitionary scenarios (such as the "delayed transition" scenario), we would expect global governments' and corporations' carbon emissions to be tending towards zero, in order to meet any net-zero targets by 2050, thereby mitigating physical risks. Under a "fragmented world" scenario (where countries with net-zero targets are assumed to meet c.80% of their target) and under a "current policies" scenario (where no additional policies have been implemented), we would expect heightened physical impacts to be present.

Future reviews

Barnett Waddingham will review and adapt our framework on an ongoing basis. We would be happy to provide further support and analysis as appropriate either through the actuarial team or the sustainable investment team.

In the meantime, Barnett Waddingham will continue to engage with modelling and data providers, as well as fund managers, regarding best practice and improvements to methodologies, data quality and coverage.

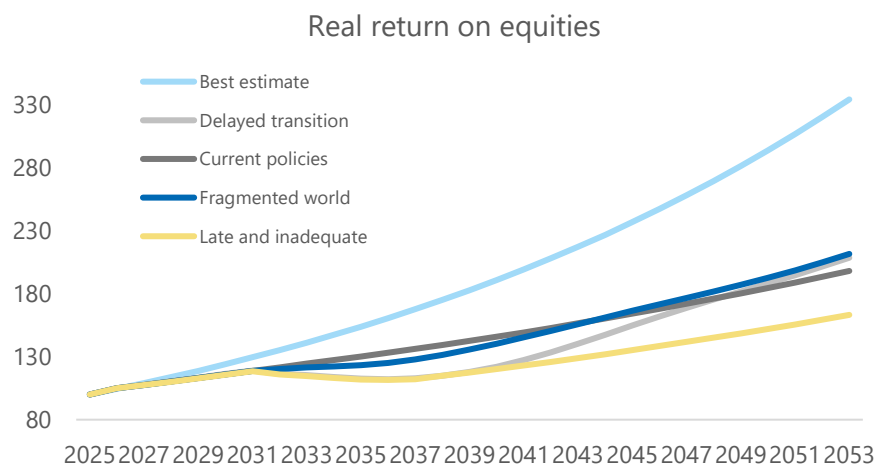
Appendix 2 Asset projections by asset class under each scenario

The graphs in this section consider each asset class's performance under each climate scenario net of inflation, over a 30-year time horizon.

The "Current market pricing" scenario projections are in line with our best estimate return on each asset class, as assumed for the 2025 valuation. The other scenarios are projected with reference to this. The scale used differs between each graph.

The returns for each climate scenario are projected to be lower than our best estimate return, due to the allowance for climate risks that we believe are significantly underpriced in current market pricing.

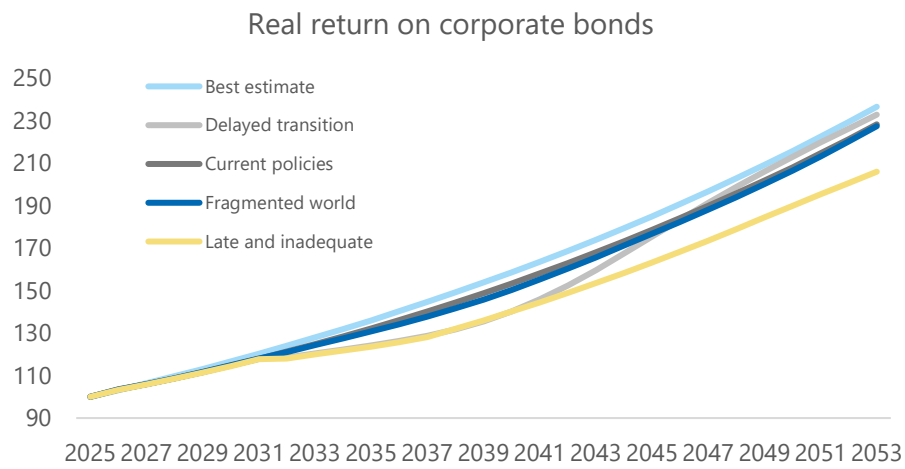
Equities



As the world enters uncharted territory with economies looking for ways to combat climate change, company shareholders face substantial risks that established business models may no longer be viable, and innovation may be necessary to survive, and thrive. The physical consequences of climate change have the potential to cause widespread damage and disruption to countries across the globe. This is likely to heighten market volatility and may trigger flights to safety by investors, which could result in a significant impact on returns.

As the graph shows, the projected returns from 2030 are lower under the "delayed transition" and "late and inadequate" scenarios because of the expected disruption that would be caused by strong policy implementation. However, there is some recovery within the "delayed transition" scenario over the long-term, due to expected physical damages.

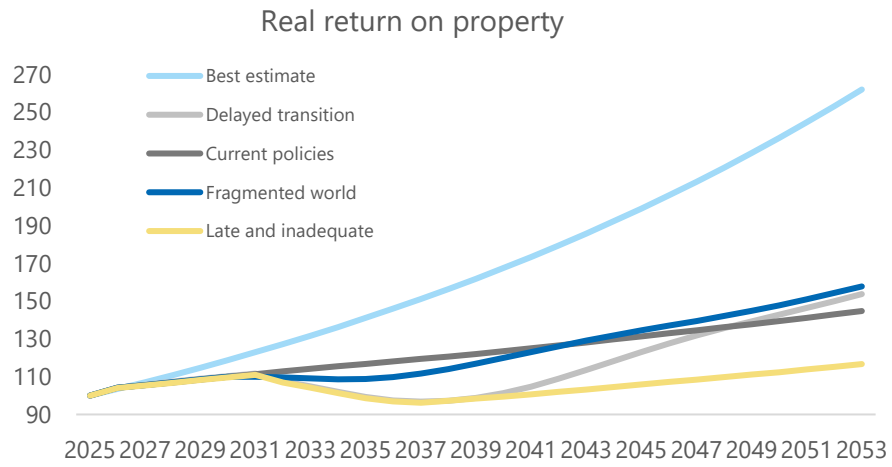
Corporate bonds



Relative to equities, global corporate bond indices have a relatively high weighting to financials, which are expected to be less impacted by transition risk, but also to industrials, which are expected to experience higher impacts. Physical risks will vary, depending on where a company's operations are based and how dependent their revenue is on their at-risk assets or supply chains. Not only may these risks harm a company's revenue, and increase the likelihood of them defaulting on the bonds, it may also result in companies having to issue more debt. Recovery rates on bonds may also be impacted, due to the risk of stranded assets.

However, due to the characteristics of corporate bonds, impacts are expected to be significantly less, versus their equity counterparts.

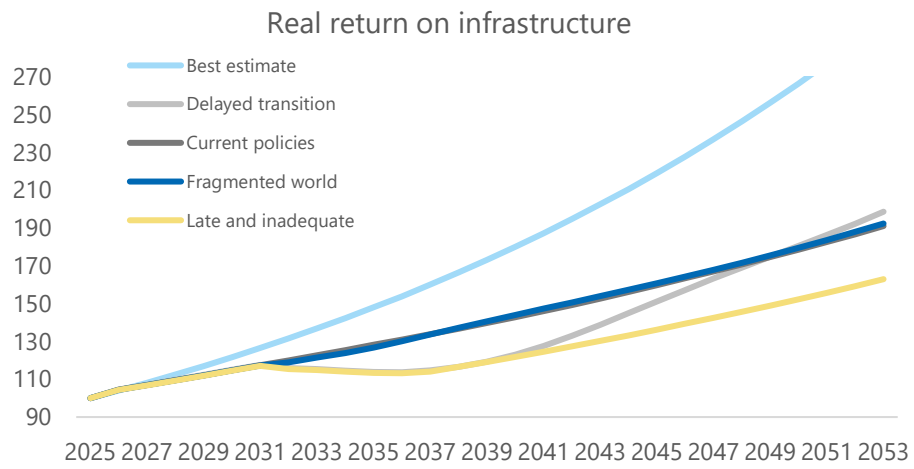
Property



Property will be a key contributor to the UK's journey to a low carbon economy. The UK Government's Minimum Energy Efficiency Standards (MEES) could require more stringent minimum energy efficiency standards for commercial property. This may result in large upgrade costs to property owners and may result in stranded assets (whereby the cost of upgrading the building is not feasible). As a physical asset, property has high exposure to physical climate risks. For example, a property near the coast may be at more risk of flooding due to rising sea levels, whereas a property in the financial hub of London may be better protected by government spending on sea defenses.

As a result, property returns are assumed to be significantly impacted by climate risks.

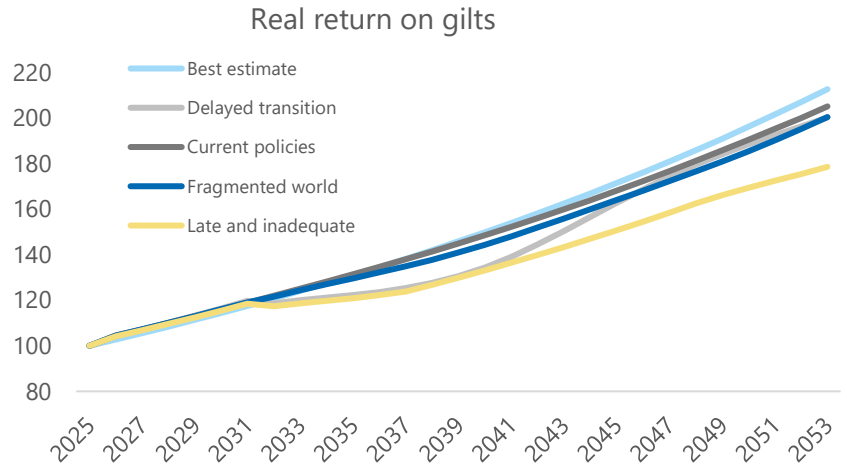
Infrastructure



Infrastructure is central to achieving a low-carbon economy but faces major challenges. High-emission sectors like oil and gas may see assets become obsolete or stranded due to costly upgrades and declining demand. Transition risks—such as shifting consumer preferences and stricter climate policies—could disrupt infrastructure linked to carbon-intensive transport. Physical climate risks, including storms and floods, threaten infrastructure directly and through supply chains, especially in vulnerable regions like Africa and South Asia. These risks may drive up insurance, adaptation, and repair costs. In high-risk areas, insurers may withdraw, making projects harder to finance and more exposed to losses.

However, there may be significant opportunities in transitioning the global economy to low carbon, as well as protecting against, and repairing after, the adverse impacts of physical climate risks.

Gilts

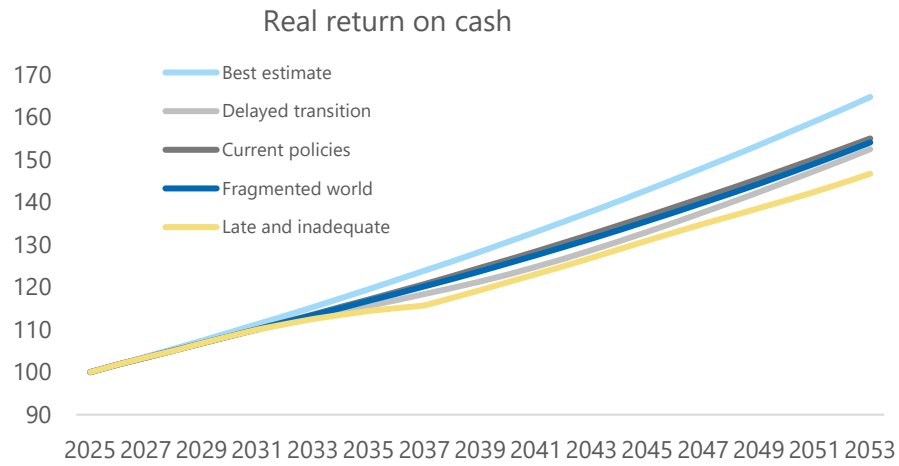


The UK was the first major economy to make a net-zero commitment. However, the UK's efforts are currently deemed to be 'insufficient' in meeting these objectives. Nevertheless, we believe that the UK will be in a relatively better position with regards to managing climate risk than many other developed and emerging nations. However, the UK is not immune to climate risks. On the physical side in particular, large areas of the UK, including major cities, are expected to be below sea level in a scenario where temperatures increase significantly. These risks may impact businesses and result in lower tax revenues for the UK government, coupled with potential for increased spending.

There is an argument that demand for UK government bonds will be supported during times of market stress (due to a flight to safety and increased monetary policy) but, conversely, we may also expect supply to

increase to balance the fiscal budget, as a result of increased fiscal spending and / or decreased tax revenue.

UK Cash



Transition and physical climate risks may prompt the Bank of England's monetary policy committee to help stimulate the economy, resulting in the potential for lower UK cash rates. Disruptions could arise from counterparties and banks, either through direct exposure or broader economic impacts, especially in the short to medium term as regulatory interventions intensify. Inflation may erode cash returns, particularly in disorderly transitions. However, due to the short-term nature of UK cash investments and limited exposure to physical risks, the overall impact is expected to remain relatively small—even under extreme scenarios.

If the Fund wishes to consider any alterations to their investment strategy, then advice should be taken from their investment advisers. The Fund's objectives as a whole, along with the other risks and opportunities to which the Fund is exposed, should also be considered.