TCFD - Strategy & Risk Management

Scottish Borders Council Pension Fund

June 2023





Agenda for today

- Introduction TCFD Recap
- 2022/23 ESG Project Plan Recap
- Timeframes & Scenarios Modelled
- Scenario Analysis Results
- Climate Opportunities
- Climate Dashboard

Implementation of TCFD

This paper focuses on Strategy and Risk Management



Governance

- Responsibilities agreed
- Governance frameworks updated
- Training received
- ESG policies / beliefs reviewed



- Climate risks / opportunities considered
- Scenario analysis undertaken
- Review should include funding and covenant information



Risk Management

- Incorporate climate risk into risk frameworks
- Review your investment managers
- Consider materiality of risks across asset classes.



- Disclose metrics
- Set targets against metrics
- Review and improve

Annual TCFD Report to be published on a public website in due course

- Annual disclosure actions taken on all 4 areas of TCFD recommendations.
- The Fund's first TCFD report will need to be made publicly available in the near future.

2022/23 ESG project plan

Completed July 2023 and beyond June 2023 Q3 2023 and beyond ✓ Initial training on TCFD CFD report submission ✓ Updated ESG Policy requirement date still unknow Climate governance documentation agreed Q2 2023 Annual impact Committee Training on and selection of metrics and targets assessment meeting Climate scenario ✓ Include climate change within advisor objectives Climate scenario analysis analysis required in ✓ Climate metrics & target report first year of reporting

Impact assessment

Ongoing monitoring of

metrics and targets

Scenario analysis: executive summary



Analysis completed



Key findings



Key risks



Opportunities

We have considered three different scenarios (e.g. assuming different levels of action taken to manage carbon emissions) over various time periods

The estimated return "drag" over the next 10 years is fairly limited at 0.3% to -0.6% p.a. – but could be more volatile in the near term

The Fund's equity allocation is most exposed to the impact of climate related intervention

As illiquid assets run-off over time, the Fund can consider sustainable / ESG tilts within liquid credit assets

Timeframes & Scenarios

Timeframes

	Short term 3 years	Medium term 10 years	Long term 20 years	Very Long term 50 years
Investment Horizon	 Actuarial review cycle Review of target asset allocation Possible de-risking of the asset allocation 	Target for significant funding improvement and increased stability	Approximate duration of the Fund's liabilities	 Fund is open to new members and accrual Longest term liabilities are 50yrs +
Climate Horizon	 Setting and measurement of decarbonisation targets Improvement in data quality Government responses to COP27 	 Companies monitor progress towards 2050 net zero World measures outcomes against the 2030 Sustainable Development Goals and 2030 biodiversity goals 	 Physical damages from climate change starts to scale up, towards mid-century, most severe under current policies. Continue to measure against 2050 net zero targets. 	 Long term physical damages incurred, most severe under current policies. Impact of Net Zero by 2050 targets.

Scenarios - Descriptions

Net Zero 2050

- Paris aligned scenario temperatures kept to a 1.5°C rise this century
- CO₂ emissions reach net zero in 2050 globally, but only some regions achieve global GHG net zero by 2050
- Immediate global action applied uniformly to decarbonise hence relatively high transition costs incurred, particularly in the near term
- Physical damages are minimised

Divergent Net Zero

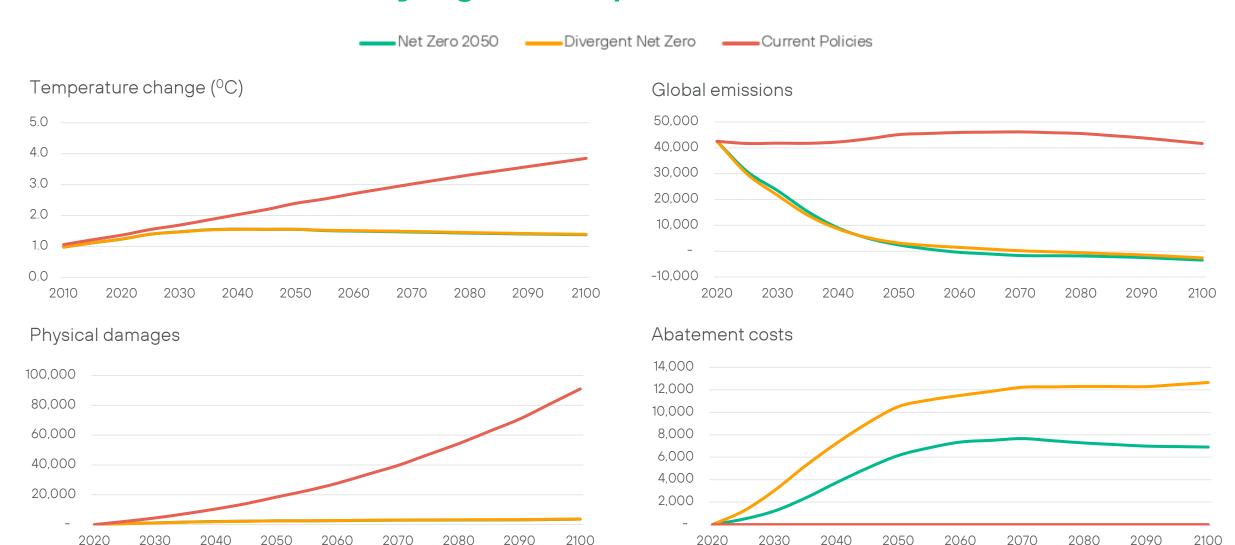
- Paris aligned scenario temperatures kept to a 1.5°C rise this century
- Divergence in decarbonisation policies across sectors results in higher transition costs e.g. the transport and building sectors instil more stringent climate policies than the energy and industrial sectors
- Physical damages are minimised

Current Policies

- The world largely fails to meet the ambition set out in the Paris Agreement, resulting in 3.8°C of warming this century
- Current global climate policies are implemented, but no further ramping up of climate policy ambition over time, resulting in lower transition costs
- Higher physical risks arise as a result of rising global temperatures, with shifts in weather patterns and a increased incidence of natural disasters

We also include a 'climate neutral' Baseline Scenario that assumes a continuation of the world today, with current policies in place and no costs associated with transitional or physical climate risk

Scenarios – Underlying assumptions



Source: Moody's

Quantitative analysis - Modelling limitations

Tipping points

- Investor approaches to climate change scenario analysis are necessarily simplified
- Investor modelling uses linear equations to represent the climate system which cannot capture irreversible changes in the climate system, known as climate tipping points

Granularity

- We assume climate-related impacts are the same for each asset class as a whole, in reality, the actual underlying companies may perform better or worse than the global average
- Climate modelling simulates large-scale systems, small-scale localised impacts become harder to represent

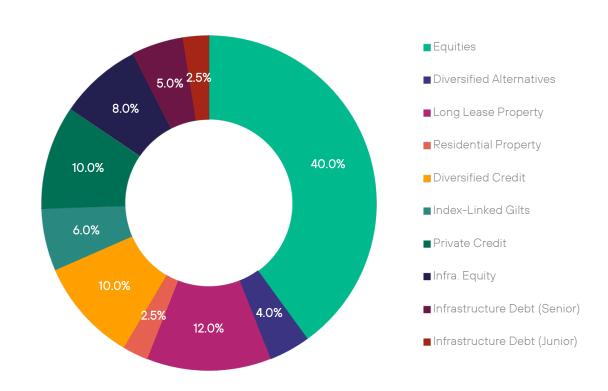
Other limitations

- We cannot model "unknown unknowns" i.e. climate risk or technological progress not yet discovered
- Modelling involves very long time horizons and any uncertainties will compound over time

Scenario Analysis Results

Current portfolio and assumptions

- Within this climate scenario analysis we have modelled the target strategy outlined on the right, these allocations are modelled to stay static over time.
- The assets and liabilities have been analysed as at 30 June 2022, and have been adjusted for the following to align with the subsequently agreed strategic allocations:
 - The allocation to the IFM Infrastructure Equity
 Fund which was drawn in January 2023 has been included in the portfolio.
 - The remaining allocation Balanced Property (via the UBS Property) has been excluded.
 - The commitment to Residential Property (via the CBRE Fund) has been included in the portfolio.
 - The rest of the portfolio has been scaled accordingly to allow for the above adjustments.



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Asset impacts – Target investment strategy

The charts below show the modelled impact for each of the climate scenarios on the investment strategy.

Asset impacts – p.a. return drag relative to Baseline scenario

Scenario	Short-term 3 years	Medium-term 10 years	Long-term 20 years	Very Long-term 50 years
Net Zero 2050	-1.6%	-0.2%	-0.8%	-0.6%
Divergent Net Zero	-2.6%	-0.7%	-1.0%	-0.6%
Current Policies	-0.1%	-0.6%	-1.1%	-0.8%

< -1.0% p.a.	-1.0% – 0.5% p.a.	-0.5% - 0% p.a.	> 0% p.a.

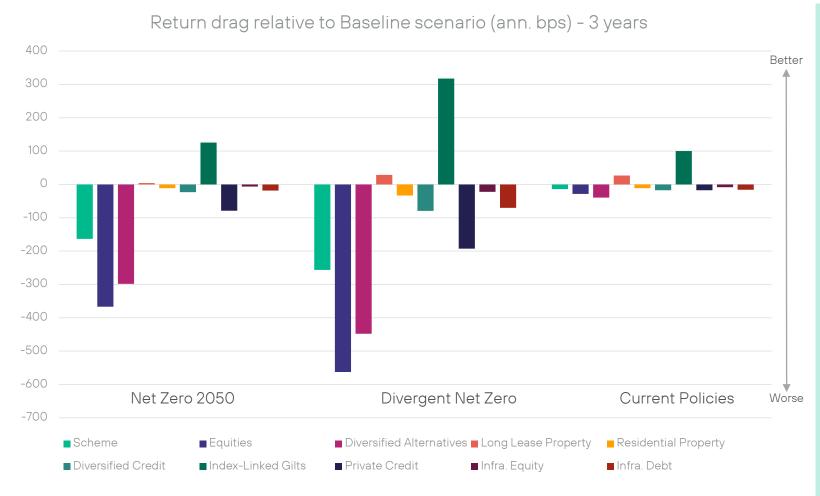
Key points

- Over the short term, as expected, the Current Policies scenario experiences the least return drag relative to the base scenario as drastic temperature rises are not yet experienced i.e. limited physical damages of climate change.
- Conversely, the Divergent Net Zero policy experiences the greatest return drag as it reflects more costly decarbonisation than the Net Zero 2050 scenario.
- Over the short-term, transition costs are incurred, in particular under Divergent Net Zero. This reinforces the importance of having an investment strategy that invests in companies that are ready for the transition, so costs are minimised.
- Physical damages start to appear over the long term but given the long term timeframe is only 20 years these damages are moderate, we see this significantly ramp up >20 years (very-long term time horizon).
- We have included detailed longer term analysis in the appendix.

The Baseline scenario assumes no transition or physical impacts of climate change i.e. a climate neutral scenario.

Source: Isio, Moody's. This is based on stochastic modelling, with the median outcome shown. Whilst we have modelled the potential physical and abatement costs over the next 50 years, in theory, markets may price these in sooner. The model's projections are sensitive to the underlying methodology and assumptions. No guarantee can be offered that actual outcomes will fall within the range of simulated results. Due to the long projection period, the model's outcomes are particularly reliant upon the underlying assumptions. Therefore, more attention should be paid to the relative comparisons between different projections than to the absolute magnitude of the results.

Asset class impacts (short term)



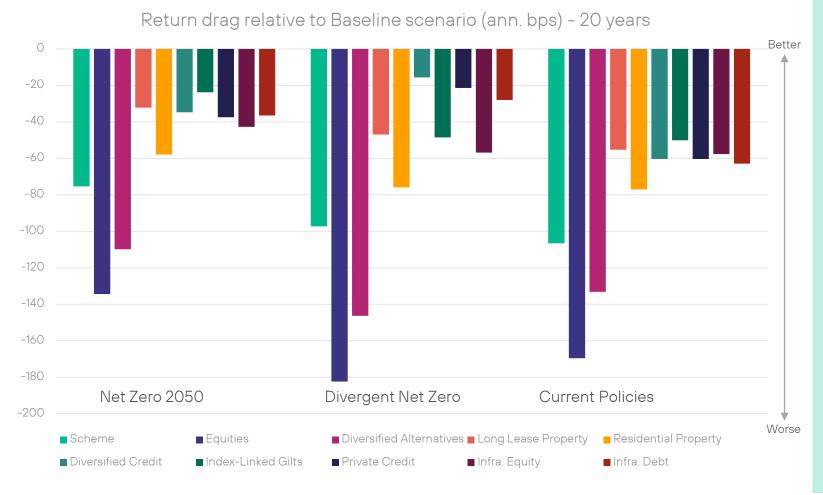
Key points

- These results isolate the impact against each asset class
- Transition risks show through more strongly in the short-term, as the world decarbonises to achieve the Paris Agreement goals. Physical risks are extremely modest in the short-term.
- Liquid markets experience first wave impacts, as low carbon risks and opportunities are quickly priced in. Equities are the most impacted. The investment return drag for the credit asset classes is less significant.
- Over a short-term period we can see that negative return drag for each asset class is less under the Net Zero 2050 scenario when compared to the Divergent Net Zero scenario. This is due to the fact that the transition to net zero under the Net Zero 2050 scenario is more orderly when compared to the Divergent Net Zero scenario.
- With a flight to quality, investors seek out the highest credit quality and associated ability to repay debt in the face of rising decarbonisation costs. Increased demand for gilt issues, in particular, may lead to a small positive impact on performance.
- Results for the Current Policies scenario show limited return drag as the expected costs from rising physical damage are not expected to occur

Source: Isio, Moody's. This is based on stochastic modelling, with the median outcome shown.

Note that annualised return drags are shown but costs and impacts in reality won't be uniform. Whilst we have modelled the potential physical and abatement costs over the next 50 years, in theory, markets may price these in sooner. The model's projections are sensitive to the underlying methodology and assumptions. No guarantee can be offered that actual outcomes will fall within the range of simulated results.

Asset class impacts (long term)



Key points

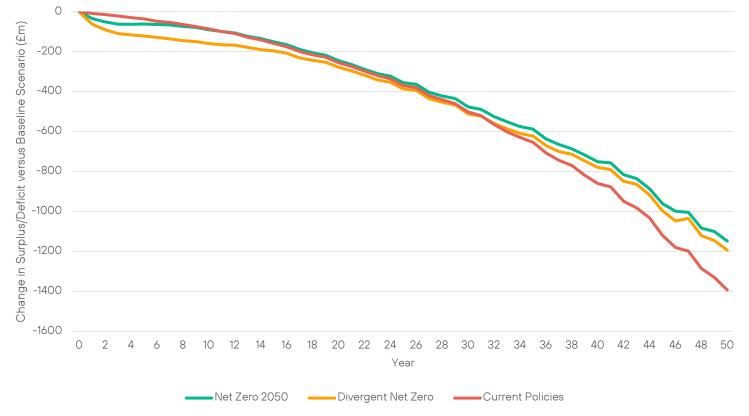
- The long-term time horizon also shows the intersection of decelerating decarbonisation risks and accelerating physical risks. The Net Zero and Divergent Net Zero scenarios continue to show negative embedded investment drags from the world seeking to meet 2050 net zero commitments, with physical risks starting to become dominant.
- We can see the delayed impact of a disorderly transition, as the two net zero scenarios will have delivered the same outcome of net zero by 2050, the Divergent Net Zero will have incurred higher transaction costs. Although impact at overall Fund level is marginally different between these two scenarios, the greatest impact is under the Current Policies scenario.
- We also see significant impacts of the physical costs of rising global temperatures across all asset classes.
- We believe the investment management industry as a whole is less well positioned to adapt to the physical risks of climate change (with stronger emphasis being placed on decarbonisation). We note that insurers may award stronger thought to assessing physical risks as they have a longer term mindset.

Source: Isio, Moody's. This is based on stochastic modelling, with the median outcome shown.

Note that annualised return drags are shown but costs and impacts in reality won't be uniform. Whilst we have modelled the potential physical and abatement costs over the next 50 years, in theory, markets may price these in sooner. The model's projections are sensitive to the underlying methodology and assumptions. No guarantee can be offered that actual outcomes will fall within the range of simulated results.

Funding level projections

The chart below shows the modelled change in surplus/deficit under the Plan's investment strategy for each of the climate scenarios, relative to the Baseline scenario.



The Baseline scenario assumes no transition or physical impacts of climate change i.e. a climate neutral scenario Source: Isio, Moody's. This is based on stochastic modelling, with the median outcome shown. Liabilities are modelled on a gilts +3.1% basis. Whilst we have modelled the potential physical and abatement costs over the next 50 years, in theory, markets may price these in sooner

The model's projections are sensitive to the underlying methodology and assumptions. No guarantee can be offered that actual outcomes will fall within the range of simulated results. Due to the long projection period, the model's outcomes are particularly reliant upon the underlying assumptions. Therefore, more attention should be paid to the relative comparisons between different projections than to the absolute magnitude of the results

Projected surplus/deficit (£m, median)

Scenario	3 years	10 years	20 years	50 years
Baseline	269	453	882	3,216
Net Zero 2050	206	363	636	2,067
Divergent Net Zero	159	294	603	2,021
Current Policies	247	366	626	1,822

Key points

- The funding position is impacted by the pathway followed to achieve net zero by 2050.
- If the world fails to transition to a low carbon economy, over the longer term, the Current Policies scenario shows the start of significant physical impacts. Over a 50-year period this is estimated to result in a c.£1.394m reduction in surplus, compared with Baseline.

Scenario analysis – Key takeaways

- Over the shorter and medium term, the costs associated with the transition to a lower carbon economy are clear within the Net Zero 2050 and Divergent Net Zero scenarios. This reinforces the focus on investing in companies that are prepared for the transition, where transition risks are minimised.
- Over the longer term, from c.2043 onwards, the costs relating to physical damages are significant within the Current Policies scenario, with temperatures reaching a c. 2.4°C rise above pre-industrial levels by the end of 2050
- Whilst impacts under the Current Policies scenario are minimal over the shorter term, consideration should be given to the wider implications of this scenario and impacts over the longer term.
- The Equity, Diversified Alternatives and Residential Property mandates have potentially the greatest exposure to transitional and physical risk. The allocation to equity is relatively large today but could reduce somewhat as the Fund matures and continued to de-risk over time.

This analysis provides a base case for future discussions and to consider longer term opportunities.

Climate Opportunities

Climate opportunities

Implemented

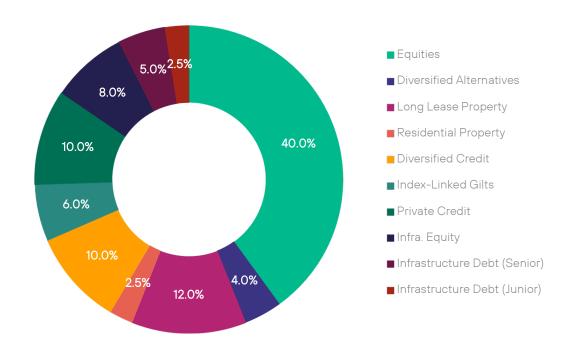
• Equities: The Fund has invested in the Morgan Stanley Global Sustain and the LGIM Future World Equity Funds, which combined, currently make up c. 22% of the portfolio. The Fund has also switched it's global equity holding with Baillie Gifford to a Paris Aligned version of the fund.

Opportunities

- Timberland: The Fund is currently considering an allocation to the Nuveen Global Timberland Fund, which will initially make up a small (c.1%) allocation of the portfolio. Whilst this is a small allocation it could well grow over time as part of a wider Impact allocation. Forestry is a key solution of climate change mitigation given the carbon sequestration.
- Renewable Energy Infrastructure: The Fund is currently considering an allocation to the Quinbrook Renewable Energy Impact Fund. which will initially make up a small (c.1%) allocation of the portfolio. Whilst this is a small allocation it could well grow over time as part of a wider Impact allocation. Renewable Energy Infrastructure is a key solution of climate change mitigation given the carbon sequestration.

Opportunities (cont.)

Multi-asset credit/Liquid credit: As the illiquid mandates roll
off, sustainable liquid credit solutions could be considered.
We are seeing considerable innovation of products in this
space in terms of forward-looking climate alignment and
wider ESG risk management.



Climate Dashboard

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Climate dashboard



						Assets					
Risk	Time frame	Equities	Diversified Alternatives	Property	Diversified Credit	Index-Linked Gilts	Private Credit	Infrastructure Equity	Infrastructure Debt	Liabilities	Covenant
	Short term (3 years)										
onal enario	Medium term (10 years)										
Transitional (net zero scenario*)	Long term (20 years)									TBC	TBC
(net	Very Long term (50 years)										
(oi	Short term (3 years)										
Physical policies scenario)	Medium term (10 years)									TBC	TBC
Phy (current poli	Long term (20 years)										
lno)	Very Long term (50 years)										

Expected allocation change reflects the expected change in asset mix as the Fund's funding position improves and membership matures.

^{*} The directional impacts under the 2050 Net Zero and Divergent Net Zero scenarios are likely to be similar, albeit the magnitude and timing is expected to differ.

TCFD Report

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TCFD report – next steps

The TCFD report will lay out the Committee's governance processes and key findings with respect to climate change reporting, in line with the TCFD's framework.

This is not yet a requirement for LGPS to complete this report - and the timescales for it becoming a requirement remain unknown – however the Committee may want to consider whether they wish to anyway.

The Fund's first TCFD report will need to be made publicly available in due course, and in line with the Fund's Report & Accounts timeframes

The TCFD recommendations focus on four pillars of disclosure:

- Governance Committee governance relating to climate risks and opportunities
- **Strategy** The actual and potential impact of climate risks & opportunities on the Fund
- Risk Management How the Committee identifies, assesses and manages climate-related risks
- Metrics and Targets To identify and manage climate risks

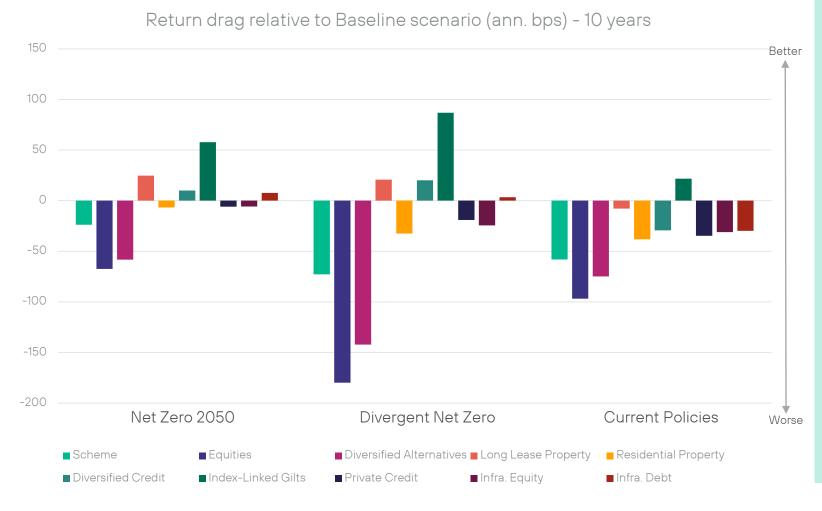
Appendix

Additional Information

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Asset class impacts (medium term)



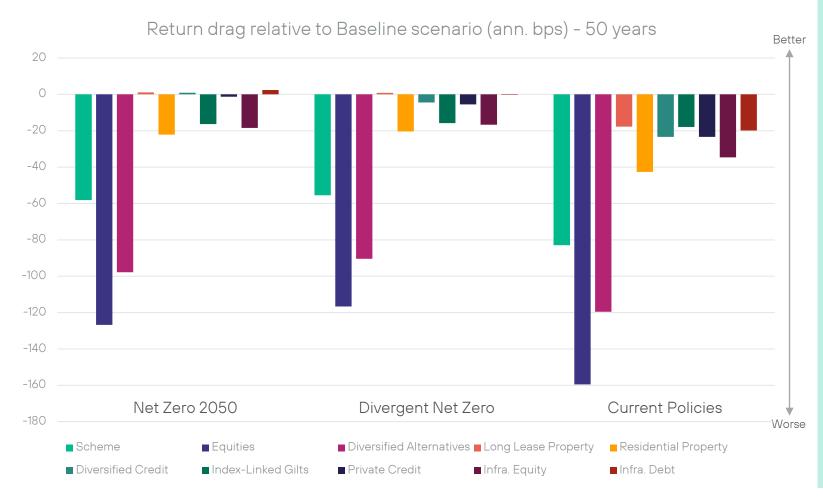
Key points

- Relative to the Baseline scenario, as transitional. and physical costs increase in the medium-term, some asset classes are impacted more than others. Physical damages begin to appear within the Current Policies scenario
- As with the other timeframes analysed, the equity assets have the strongest negative impact on returns.
- In the credit assets, we can see the clear differentiation of the Current Policies scenario with stronger physical risks showing through, as compared with the net zero scenarios.
- As transitional and physical costs increase, yields are expected to decrease as investors flock to safer assets. This has a positive effect for the Fund's holding in the M&G UK Index-Linked Gilts Fund.

Source: Isio, Moody's. This is based on stochastic modelling, with the median outcome shown.

Note that annualised return drags are shown but costs and impacts in reality won't be uniform. Whilst we have modelled the potential physical and abatement costs over the next 50 years, in theory, markets may price these in sooner. The model's projections are sensitive to the underlying methodology and assumptions. No guarantee can be offered that actual outcomes will fall within the range of simulated results.

Asset class impacts (very long term)



Key points

- Over the very long term, the impact of a disorderly transition to net zero is minimal as the outcome at an overall Scheme level under the Divergent Net Zero and Net Zero 2050 scenarios are largely the same.
- The impact at Scheme level is much more pronounced under the Current Policies scenario over the very long term.
- Similarly to the long term, over the very long term, long lease property and infrastructure debt perform better under the Net Zero 2050 scenario when compared to the Divergent Net Zero and Current Policies scenarios. This reemphasises the sensitivity of these assets to climate change risk.

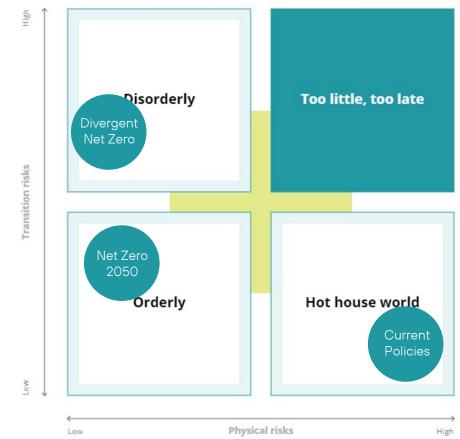
Source: Isio, Moody's. This is based on stochastic modelling, with the median outcome shown.

Note that annualised return drags are shown but costs and impacts in reality won't be uniform. Whilst we have modelled the potential physical and abatement costs over the next 50 years, in theory, markets may price these in sooner. The model's projections are sensitive to the underlying methodology and assumptions. No guarantee can be offered that actual outcomes will fall within the range of simulated results.

Scenarios - Transition and physical risks

Climate scenarios are hypothetical futures, which can apply different levels of climate action and explore how this translates into the price, availability and deployment of low carbon technologies. The resulting emissions and temperature pathways will therefore produce a unique combination of physical and transition risk with differing economic and financial impacts over time.

- **Transition risks –** risks arising from the transition to a low-carbon economy, which are expected to be strongest in the short-term given climate-related regulatory developments, market trends and decarbonisation action. The timing and the speed of the transition are important in determining the extent of transition risks.
- Physical risks risks arising from the physical impacts of climate change (including both sudden onset natural disasters and slower shifts in weather patterns), which are expected to scale up in the long term as atmospheric emissions increase global average temperatures, impacting on climate systems. This warming will make the climate more extreme and unpredictable, with impacts most severe under high emissions scenarios



The climate model

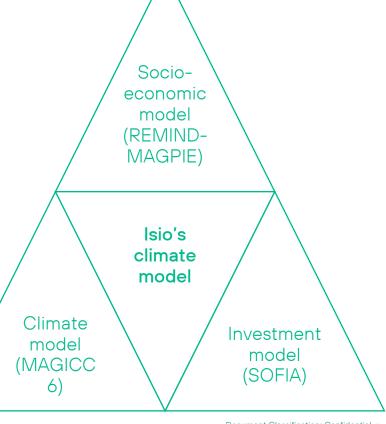
We have partnered with Moody's to deliver a climate change model. Isio's proprietary Asset-Liability Stochastic "SOFIA" model now incorporates a variety of climate change scenarios, in order to understand the potential impacts of rising transitional and physical costs associated with climate change, on a client's investment strategy and funding position.

An overview of the model, across 3 building blocks:

Climate modelling is based on the MAGICC 6* climate model

2. Socioeconomic modelling is based on the REMIND-MAGPIE* general equilibrium model

3 The investment model is Isio's SOFIA model



Return and volatility assumptions

Introduction to the assumptions

- These are our "best estimate" asset class return, volatility and correlation assumptions. We believe there is a 50:50 chance that the actual outcome will be above/below our assumptions.
- The assumptions are expressed in absolute terms over a 10-year period however the modelling period is longer than 10 years.
- Return assumptions are:
- Annualised (i.e. geometric averages), rounded to the nearest 0.1%.
- Expressed relative to the yield on fixed interest gilts (the annual yield at the 10-year tenor on the Bank of England spot curve). This yield was 2.3% at 30 June 2022.
- Net of management fees.
- Before tax. UK pension schemes are exempt from tax on investments. The impact of taxation may reduce returns for other investors.
- Volatility assumptions are based on the standard deviation of annual returns over a 10-year period.
- Bond volatilities are sensitive to the duration of the index. Our Fixed Interest Gilts (FIG) and Index-Linked Gilts (ILG) assumptions both relate to Over 15 Year indices, but the cashflow profile of the ILG index is considerably longer than the FIG index. Hence, the difference in volatilities does not necessarily mean that real yields are assumed to be more volatile than fixed yields.
- Please note that the assumptions have a subjective element, particularly for asset classes with less history and greater reliance on active management.
- These assumptions are the "baseline" assumptions, before climate impacts are accounted for with the non-baseline scenarios.

Return and volatility assumptions – 30 June 2022						
Asset Class	Sector ¹	Return (%) ²	Volatility (%) ³			
	Developed Markets – Climate Aware Passive	4.0	20.0			
Equity	Developed Markets – Core Active	4.5	20.5			
	Global Unconstrained – Climate Aware	5.0	21.0			
Property	UK Balanced Property	2.4	13.0			
	Long Lease Property	2.5	8.0			
Alternatives	Diversified Alternatives	6.0	18.0			
	Infrastructure Equity (higher risk) ⁵	4.9	15.0			
	Direct Lending	4.2	10.5			
Credit ⁴	Infrastructure Debt – Senior	2.0	6.0			
	Infrastructure Debt – Junior	3.3	9.5			
	Multi-Asset Credit (lower risk) ⁵	2.6	6.5			
Gilts	Index-Linked Gilts (>15y) - Passive	0.0	11.5			

- 1. Includes active management except where specified as passive.
- 2. Expected return per annum, net of fees, relative to the yield on fixed-interest gilts.
- 3. Expected standard deviation of absolute annual returns.
- 4. Includes allowances for downgrades and defaults.
- 5. "Lower risk" and "higher risk" are relative descriptions within the asset category only, with no wider meaning Source: Isio

Modelling methodology

Modelling Principles

- SOFIA is a stochastic model that simulates a large number of possible future economic outcomes, in which financial conditions develop in a number of different ways, defined by assumptions for average outcomes, range of variability, and inter-dependency between different markets.
- The high-level market scenarios are generated by a third-party Economic Scenario Generator (ESG) provided by Moody's Analytics. The ESG is an industry-standard tool that is widely used by financial institutions (e.g. insurers, asset managers, and investment banks). Both the climate scenarios and the underlying economic impacts are provided by Moody's Analytics.
- Based on the scenarios generated by the ESG, SOFIA simulates asset-class returns calibrated to Isio Investment Advisory's asset-class assumptions.
- SOFIA takes the initial starting position of the assets, and projects these values forward under the simulated scenarios, taking into account any relevant inflows and outflows.
- Different investment strategies are modelled in order to illustrate the effects of different allocations. In each case, SOFIA assumes that the strategy remains constant over the full projection period. Assets are annually rebalanced back to the original allocations.

Modelling methodology

Compliance Statement

- This report, and the work relating to it, complies with "Technical Actuarial Standard 100: Principles for Technical Actuarial Work" ("TAS 100").
- This report has been prepared for the purpose of assisting the addressee in quantifying climate risk and feeding into a TCFD report. If you intend to use it for any other purpose or make any other decisions after considering this report, please inform Isio and we will consider what further information or work is needed to assist you in making those decisions.

Material Assumptions

- Isio Investment Advisory's central asset-class assumptions are assessed and revised at each calendar quarter-end. The assumptions used within this modelling exercise are set out in this Appendix.
- Certain assumptions are sourced directly from the Moody's Analytics ESG and available market data, or set via adjustments to these sources. Where required or deemed to be more appropriate, assumptions are entirely determined by Isio Investment Advisory. The assumption setting process is subjective and based on qualitative assessments rather than a wholly quantitative process. Where judgement is required, input is received from Isio's internal asset-class research teams.

Limitations and Risk Warnings

- The only risk factors considered in our modelling are those that affect the values of pension schemes' assets. The modelling results should be viewed alongside other qualitative considerations including portfolio complexity, governance burden, and liquidity risk.
- The model's projections are sensitive to the starting position and the econometric assumptions. Changes to the assumptions can have a material impact upon the output. There can be no guarantee that any particular asset class or investment manager will behave in accordance with the assumptions. Newer asset classes can be harder to calibrate due to the lack of a long-term history.
- The modelling analysis is based on portfolios containing a range of asset classes and different approaches to fund management. Clients should not make decisions to invest in these asset classes or approaches to fund management based solely on the modelling analysis.
- Portfolios that make use of derivatives are exposed to additional forms of risk and can experience losses greater than the amount of invested capital.
- No guarantee can be offered that actual outcomes will fall within the range of simulated results. Actual outcomes may be better than the simulated 95th percentile or worse than the simulated 5th percentile.

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