



ACTUARIAL SOCIETY
S O U T H A F R I C A

Retirement Matters Committee Climate Change Sessional: Update

ASSA Climate Change Committee – retirement funds working group

27 July 2026

The evidence has moved: we are already past 1.5°C

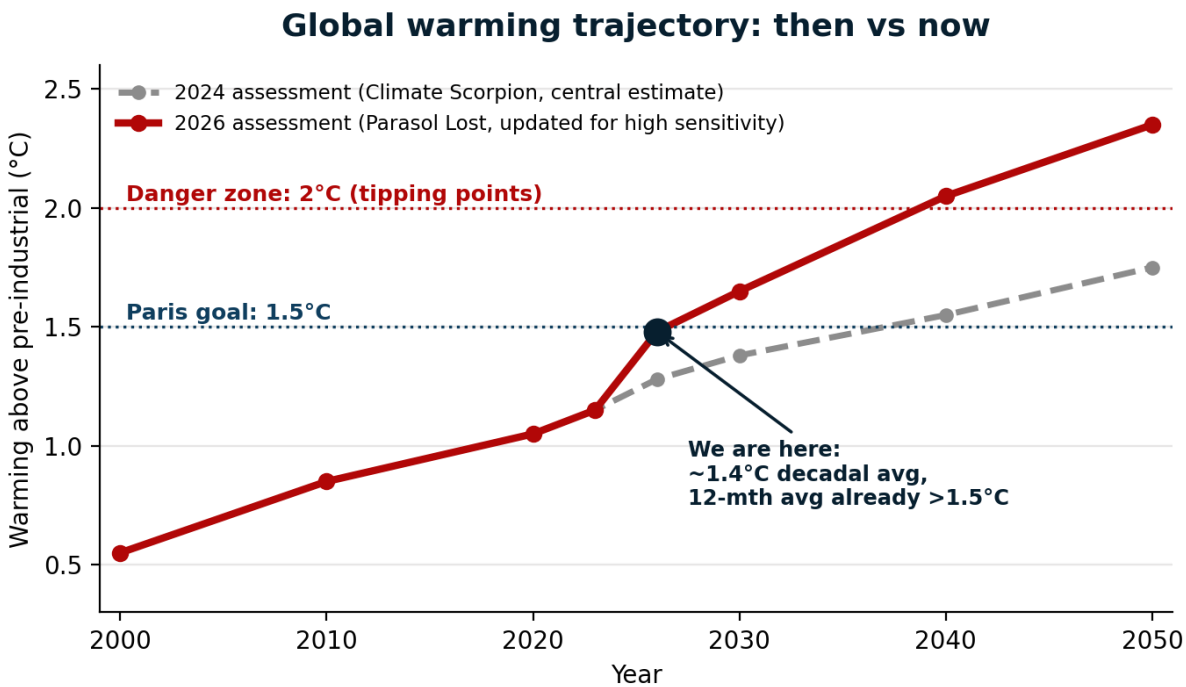


THEN — Climate Scorpion (2024)

- Significant uncertainty in future temperatures — Orderly, Disorderly, Hot-House and Too-Little-Too-Late scenarios all still considered plausible.
- Planet may warm more quickly than expected for a given level of greenhouse gases.
- GDP could fall 30%-80% assuming 3°C of warming above pre-industrial levels.

NGFS-style scenario	Status now (2026)
Orderly / Low Demand (well below 2°C)	No longer plausible
Disorderly / Delayed Transition	Increasingly unlikely
Hot-House World	BASE CASE
Too Little, Too Late	Live risk

NOW — Parasol Lost (2026)



Illustrative, based on IFoA/University of Exeter: Climate Scorpion (2024) and Parasol Lost (2026)

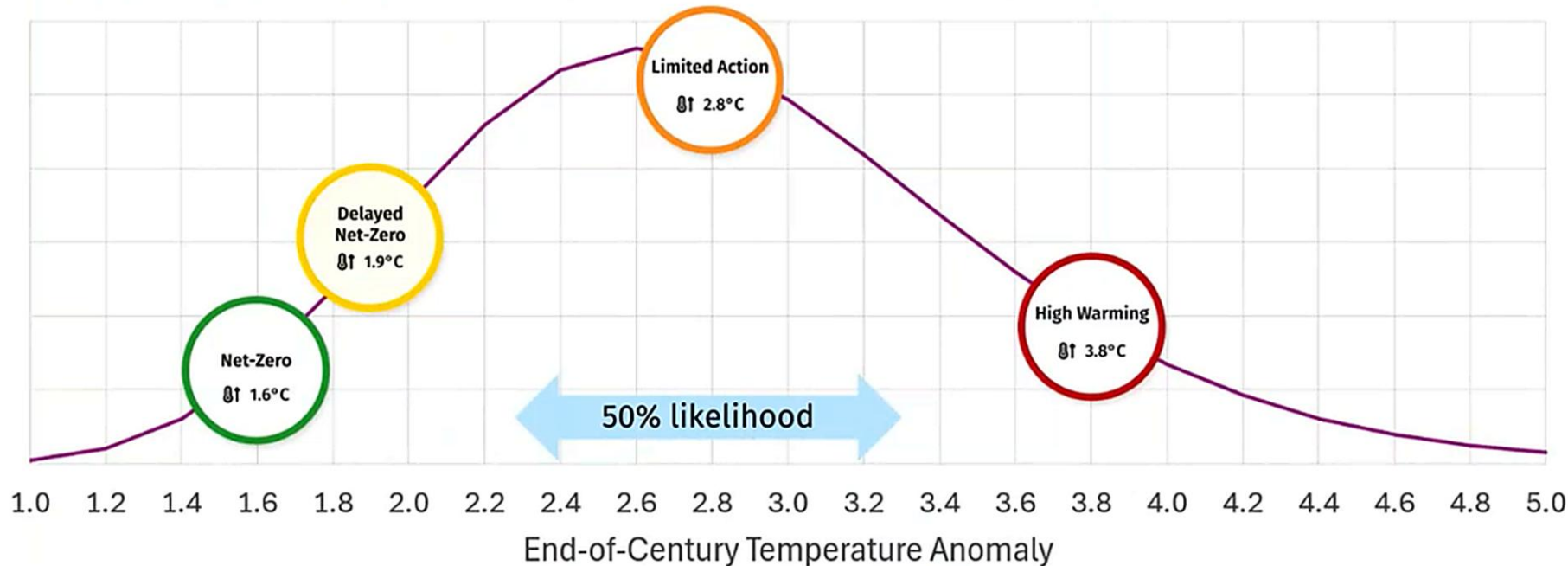
- Decadal average already 1.4°C; the last 12 months have averaged above 1.5°C — overshoot has begun.
- Aerosol cooling (~0.5°C mask) is unmasking faster than expected — a ‘termination shock’.
- Climate sensitivity trending to the top of the IPCC range: >2°C warming by 2050 now likely without action.

Fragmented Hot-House World is now the base case — not a tail scenario

Increased likelihood of future temperatures $>2^{\circ}\text{C}$



End-of-Century Temperature Anomaly
(Probability density function)



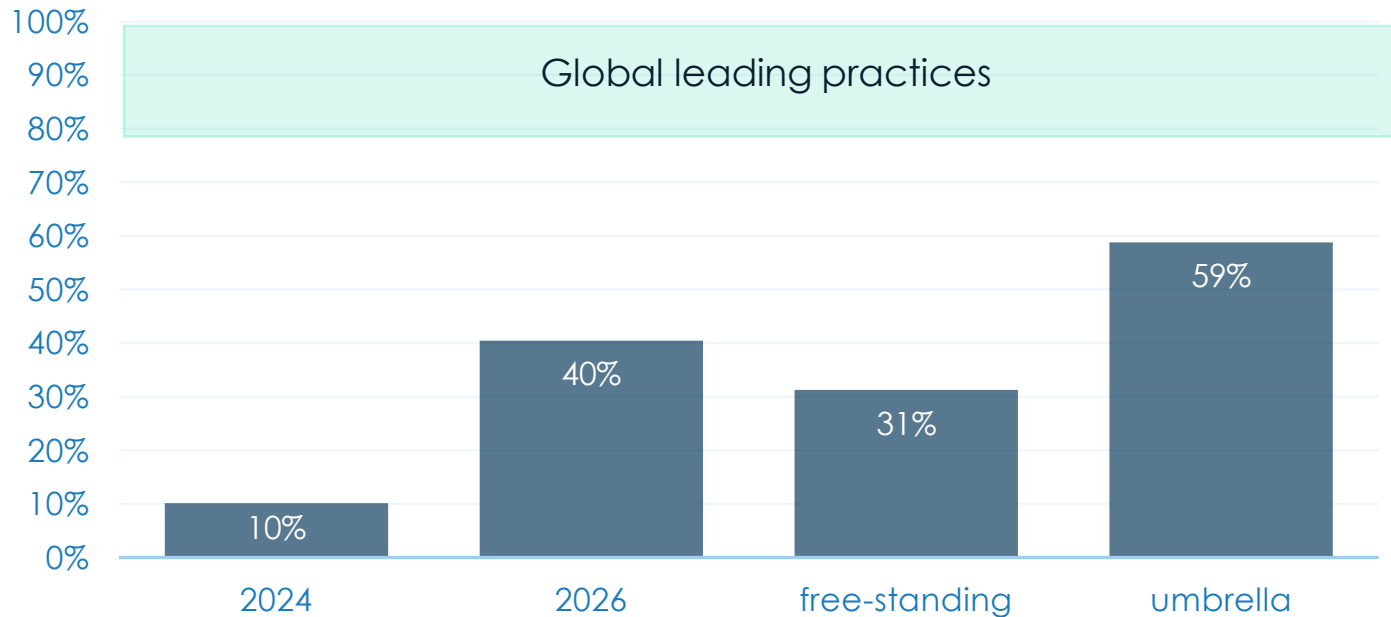
- Negative impact on future returns, with shocks possible as market responds
- Higher likelihood of lower replacement ratios in DC funds
- Higher likelihood of lower DB funding levels

Source: Ortec Finance, drawing on results from academic literature, including: Lawson, J, A Moss, A Popa, E Cairns and C Mackenzie (2023); Rebonato, R., Melin, L., and Zhang, F. (2025); Sarofim, M.C., Smith, C.J., Malek, P. et al. (2024); Venmans, F., Carr, B. (2024); Wynes, S., Davis, S.J., Dickau, M. et al. (2024).

More funds embedding climate change since 2024



Sustainability Reporting Index : climate change



- More funds making progress between 2024 and 2026
- Most industry progress observed in governance and policies
- Overall results below ideal of 80%
- Areas requiring most attention: impact measurement, scenario and stress testing

Source : 2026 Sustainability Reporting Index, Sanlam / Deloitte / Alexforbes research

A significant gap still exists between actual and ideal practices

Guide for retirement fund actuaries available!



Climate Change Guide for Retirement Fund Actuaries

(Applicable to defined benefit & defined contribution funds)

- Working group of the ASSA Climate Committee (focusing on traditional practice areas)
- Collaboration with Retirement Matters Committee and Investment Committee
- Informed by available research (including relevant notes issued by the IAA)
- Approach:
 - Arm retirement fund actuaries and investment professionals with a practical understanding of climate change
 - Encourage integration of climate change in existing retirement fund practices with practical suggestions

Update from the working group



Working group to enhance toolkit further in upcoming months:

- Explore embedding the ASSA Climate Index into the Toolkit's South African physical risk section
 - Enhance quantitative components of framework
 - Add more worked examples and simplify the heatmap template with clearer, step-by-step guidance
 - Align terminology and metrics across ASSA climate-related frameworks and the Climate Change Index
 - Extending toolkit to incorporate nature & biodiversity
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Extending the Toolkit: Nature loss, environmental degradation & environmental solvency



- April 2026 IFoA / Anglia Ruskin University report “Tipping into the Wild Unknown” flags biodiversity loss, soil degradation, water scarcity and food system fragility as systemic financial risks
- Next step for the Toolkit: broaden scope from climate risk to wider environmental degradation – an “Environmental Solvency” lens for retirement funds
- Considerations: employer covenant strength, real asset values, inflation and long-term investment strategy under nature-related risk
- Proposed as the next major workstream for the working group

\$11tn/yr

Ecosystem services provided by soil alone
— most of it food-related (Kopittke et al., 2021)

\$2.8bn/yr

Losses from soil degradation in the US
corn belt alone (Thaler et al., 2021)

55.7%

Drop in Olam Group's profit after tax,
driven by a nature-related almond yield
loss (2023)

70%

Of emerging infectious diseases
originate in animals — land-use change
raises pandemic risk

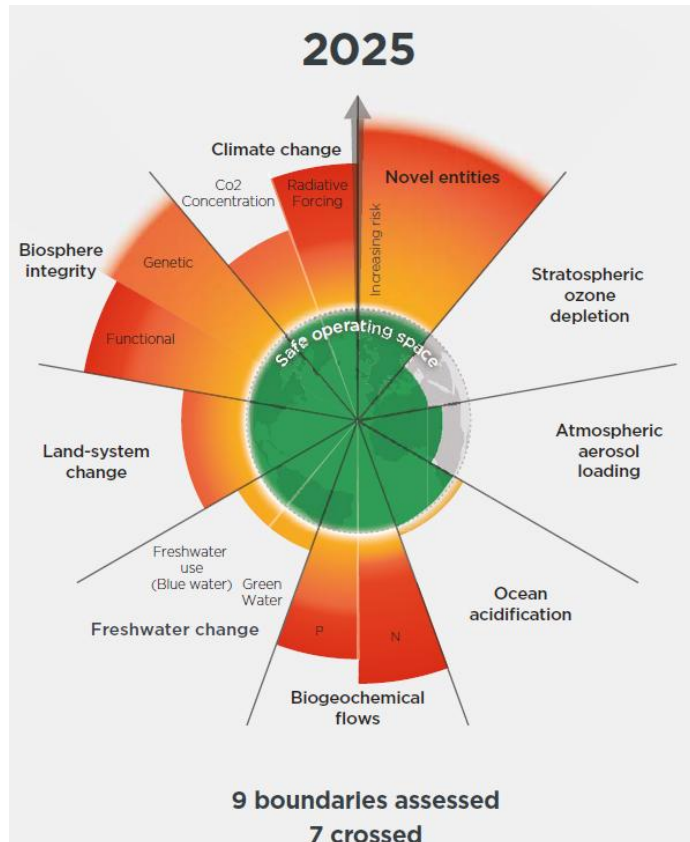
Nature loss is already a financial risk — not a future one

UK food price inflation spiked to almost 20% in 2023 as nature-related chronic risks (soil, water, pollinators) hit crop yields — the same channel that would drive food-cost/inflation risk in SA fund liabilities and covenant strength.

Nature & biodiversity and its importance to pension funds



The Planetary Solvency Report also confirms that 7 of 9 planetary boundaries are already breached, with nature impacts expected to become more severe.



Ecosystem services are integral to the global economy and wellbeing of people

It is important to recognise that the natural ecosystem and its health is fundamental to all economic activity and the wellbeing of people. According to the “Planetary Solvency Report” published by the Institute and Faculty of Actuaries, pollinators support ~75% of global crops and soil provides \$11 trillion in ecosystem services annually.

The Ecosystem Services Valuation Database estimates the value of ecosystem services to be between \$125 and \$140 trillion. To put this into context, this is greater than the value of global annual GDP.

Source: Planetary Solvency Report, Institute & Faculty of Actuaries, 2026

The report also showed that a high likelihood of nature loss reaching “extreme” and “catastrophic” levels by 2050 based on the current trajectory without intervention

Nature & biodiversity and its importance to pension funds



- Pension funds are long-term investors, investing in a range of asset classes to deliver returns to support pensioners' incomes in retirement.
- More than 50% of listed companies globally are moderately to highly exposed to nature-related risks.
- It is estimated by the World Economic Forum that around \$44 trillion of economic value globally depends on nature.
- In South Africa, we estimate that between 35% and 50% of listed companies are moderately to highly exposed to nature-related risks.
- South Africa is also highly dependent on agriculture and is also highly exposed to water-related risks.
- The South African tourism industry is also highly dependent on nature, contributing ~10% of GDP when taking direct and indirect industries into account, as well as contributing significantly to jobs in the country.
- Food inflation, affected by nature-related risks, is also a significant driver of the cost of living in South Africa with around about R17–R18 of every R100 spent by households (in the CPI measure) going to food.

Over the long-term, nature-related risks therefore impact inflation as well as returns. This ultimately affects the funding levels of defined benefit funds as well as expected pensions of members of defined contribution funds. There are also negative implications for the health and wellbeing of pensioners, including a higher risk of mortality and increased healthcare costs.

What can pension and investments actuaries do?



- Upskilling in relation to nature-related risks and the implications for investments and retirement funds
 - Review investment policies to incorporate nature-related risks and opportunities
 - Measure and monitor their nature-related risk exposure in line with the TNFD recommendations
 - Strengthen the fund's stewardship activities, to include a nature-related focus
 - Ask asset consultants and asset managers about their approach to nature-related risks and opportunities
 - Include nature-related aspects when reviewing and appointing asset managers
 - Move beyond climate-only modelling and include nature-related aspects
 - For defined benefit funds, consider the sensitivity of the fund's assets and liabilities to nature-related risks and whether solvency reserves are sufficient
 - For defined contribution funds, consider the sensitivity of replacement ratios to nature-related risks and the range of possible outcomes based on scenario analysis
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DISCUSSION
