

# Planetary Solvency: Climate Briefing for Non-Executive Directors

---

## Chapter Zero – Securing Planetary Solvency: Bringing Climate Risk to Life

This event is part of a learning project that intends to explore how creative approaches to communicating climate risk can inspire action by non-executive directors and Chairs. It is rooted in the research of the [Institute and Faculty of Actuaries \(IFoA\)](#), particularly its reports on planetary solvency, including:

- [Planetary Solvency – finding our balance with nature](#)
- [Climate Scorpion – the sting is in the tail](#)
- [Parasol Lost: Recovery plan needed](#)

The contributions at this event will position climate risk not only as a business-critical consideration for all boards, but also explore the opportunities associated with taking ambitious action now. It will open with a creative film from Chapter Zero, followed by a keynote speech from Lord Deben. The event will then continue with a panel discussion and a scenario analysis learning exercise with attendees.

***Purpose of this briefing:*** *To frame the current state of the climate system from a Planetary Solvency perspective – applying risk management disciplines to climate science – ahead of the Royal Bikes scenario workshop that attendees will complete during the event.*

### Royal Bikes: Boardroom Scenario

Royal Bikes is a fictitious UK-headquartered, AIM-listed global bicycle manufacturer founded in Leeds in 1960. Following a 1995 merger with an Italian company, most production moved to Emilia-Romagna in Northern Italy, while a small UK facility remains. After two decades of double-digit growth, performance has deteriorated sharply, with EBITDA down 45% in 2025. A new CEO has launched a strategic review to restore long-term success.

Profitability has been hit by post-pandemic overstocking and heavy discounting, alongside tariff uncertainty, low-cost competition and weak demand in key markets. Climate-related pressures have further worsened performance – Royal Bikes was optimised for a stable world, now it must operate in a system disrupted by climate risks and non-linear impacts. Royal's production model is energy-inefficient and exposed to rising energy and transport costs through its globally dispersed supply chain. It has also suffered uninsured climate-related disruption, including flooding at its Italian factory and supplier impacts from the 2025 California wildfires. Management has proposed three strategic priorities: strengthen the production model, reduce costs and improve supply chain resilience, and pivot the product catalogue for future growth.

Event attendees will discuss how to steer the company through this disrupted environment.

## Section 1: Risks and Opportunities for Boards – The Royal Bikes Lens

This section illustrates how the macro climate signals above translate into concrete board-level risks and strategic choices, using Royal Bikes – a UK-listed cycle manufacturer with manufacturing in Emilia-Romagna, Italy – as a worked example.

### Physical Climate Risks: From Macro to Factory Floor

#### Northern Italy: A High-Risk Geography

Emilia-Romagna has experienced three major flood events in sixteen months (May 2023, September 2023, September 2024). The May 2023 floods – in which some locations experienced return periods exceeding 500 years – caused €8.5 billion in regional damage and displaced 37,000 people. A 2025 scientific study found that Emilia-Romagna has a structural "cul-de-sac" geography that concentrates atmospheric moisture from the warmer Mediterranean and Adriatic, making severe flooding events more frequent and intense as sea-surface temperatures rise.

For a manufacturer with a primary facility in this region – operating with a just-in-time production model – **uninsured losses from flooding** are not a tail risk to be managed; they are a recurring operational reality. The question for the board is not *whether* further events will occur, but *at what frequency and severity*, and whether the business model can absorb them.

### Supply Chain Cascades

Royal's supply chain is globally dispersed and single-source by component: the **frame and saddle are sourced from China; brakes and gears from Japan; the chain from Taiwan; accessories from California; and wheels and tyres from Italy**. That means disruption in any one geography can propagate quickly into a European manufacturing and distribution problem, even where Royal's own factory remains operational.

This matters because climate and geopolitical risks are not confined to Italy. Heat, flooding, drought, wildfire, port disruption or power outages in East Asia or North America can delay parts, raise shipping and inventory costs, and force European firms into stop-start production patterns. This matters because there are multiple transmission channels through which disruption in external supplier regions can hit European companies: input scarcity, shipping delays, higher working capital needs, margin compression, inflationary pressure and, in more severe cases, wider macro-financial spillovers. The California wildfires of early 2025 provided a real illustration of this dynamic for Royal; in practice, the same logic also applies to East Asian component manufacturing and shipping corridors.

### Transition Risks and Opportunities

- **Energy transition risk** is real and proximate: Royal's Italian facility operates at 55% energy efficiency on a gas-powered system not upgraded since 1995. As carbon pricing and energy costs rise, this becomes a material and growing cost disadvantage. The transition opportunity – electrification connected to Italian renewable sources – offers

a pathway to near-100% efficiency, reduced running costs, lower climate transition risk, and improved insurability.

- **E-bikes represent the single largest strategic opportunity** on the risk-adjusted horizon. The global e-bike market is projected to grow from approximately 40 million units in 2023 to 77 million by 2030. E-bikes emit less than 5g of CO<sub>2</sub> per mile versus ~275g for an ICE vehicle. This positions Royal at the intersection of urban mobility, emissions reduction, and structural consumer demand – if the pivot is executed with sufficient ambition and governance support.

### **Cascading Financial and Systemic Risks**

The board should be alive to the second- and third-order risks that flow from the macro climate picture:

- **Insurability:** Insured losses from natural catastrophes have nearly doubled since 2015, growing at 5–7% per annum. If this rate continues, average annual insured losses could reach \$250bn by 2035. **Insurance withdrawal from high-risk geographies** – already occurring in parts of the US, Australia and southern Europe – removes a critical financial buffer. Boards should monitor whether their properties, facilities and supply chain exposures remain insurable, and at what cost.
- **Sovereign and macro-financial fragility:** High debt, climate adaptation costs and rising loss-and-damage are creating a sovereign triple-squeeze in many economies. This feeds through to consumer demand, credit conditions and the cost of capital.
- **Regulatory and liability risk:** Climate attribution science is advancing rapidly. Boards that have not integrated material climate risk into their strategy face growing litigation exposure.

### **The Board's Role**

The Royal Bikes scenario illustrates a pattern common to many listed companies: climate risk has already impacted financial performance but has not yet been fully integrated into board-level risk management or strategy. The board's role is not to replicate management's operational expertise, but to:

1. **Challenge the risk framing** – ensuring that climate scenarios used in planning reflect the full range of plausible outcomes, not just central projections.
2. **Set the risk appetite** – being explicit about which physical and transition risks the company is prepared to absorb versus mitigate.
3. **Stress-test strategic options** – asking whether proposed strategies remain robust under high-warming, high-disruption scenarios, not just orderly transition assumptions.
4. **Ensure disclosure is credible** – so that investors, insurers and counterparties can accurately price the company's risk exposure.
5. **Consider potential climate-related opportunities, as well as opportunities to contribute to “positive tipping points” by taking ambitious action on the transition** – consider how to best secure this value creation.

The governance principle is straightforward, and it mirrors the actuarial approach to long-term financial solvency: **boards are responsible for protecting against the risk of ruin** – not just the risk of underperformance. In a climate system operating at record temperatures with accelerating EEI, the tail risks are no longer distant. They are the new operating environment, recalibrating our approach is critical.

---

## Section 2: Climate Update – What the Risk Signals Are Telling Us

### The Temperature Trajectory

Global warming has now reached approximately **1.4–1.5°C above pre-industrial levels** on a sustained multi-year basis. The three-year average (2023–2025) was **1.47°C** – the hottest decade on record – with 2024 confirmed as the single warmest year since observations began in 1850. 2025 was the third warmest on record at ~1.41°C, and 2026 is currently tracking to be the second warmest. Critically, it is not only the *level* of warming that matters – it is the *rate*. The pace of warming has accelerated materially: from ~0.18°C per decade (1970–2015) to **0.34–0.42°C per decade** since 2015 – approaching double the prior rate.

From a risk management perspective, a trend that is worsening faster than models predicted – while policy remains calibrated to older, slower projections – is the definition of model risk operating at a planetary scale.

### Earth's Energy Imbalance (EEI): The Underlying Driver

The root cause of warming is **Earth's Energy Imbalance (EEI)**: the planet is absorbing more solar energy than it radiates back to space. EEI has **more than doubled since 2000**, running significantly above levels simulated by most climate models. The WMO's 2025 State of the Global Climate report – for the first time – formally included EEI as a key climate indicator. Ocean heat content is at record highs; the ocean has been absorbing the equivalent of **eighteen times annual global human energy use** every year for the past two decades.

New satellite data (Myhre et al., 2025, *Science*) confirms that **low climate sensitivity models cannot reproduce the observed EEI trend**, implying that warming is likely to be greater than central projections. This is important: it means the scientific community's own modelling tools have a structural bias that *understates* risk.

### The High Climate Sensitivity Signal

The IFoA's *Parasol Lost* report (January 2026) draws together three independent lines of evidence – satellite EEI data, palaeoclimate records, and observed warming trends – that consistently point to the climate being **more sensitive to greenhouse gases than the IPCC's central estimate of 3°C of warming per CO<sub>2</sub> doubling** (Equilibrium Climate Sensitivity, ECS).

### Non-Linear Risk and Tipping Points

The standard risk management assumption – that risks are proportional and reversible – does not hold for the climate system. **Climate tipping points** are thresholds beyond which changes become self-reinforcing and potentially irreversible. The Global Tipping Points Report (2025)

identifies that the danger zone begins as warming passes 1.5°C – a threshold now effectively reached. Key systems under pressure include:

- **AMOC (Atlantic Meridional Overturning Circulation):** Early warning signals consistent with proximity to tipping. Collapse would restructure rainfall patterns across Europe and Africa, fundamentally altering agricultural and water security.
- **Greenland and West Antarctic Ice Sheets:** Progressive destabilisation, with multi-metre sea-level rise implications over decades.
- **Amazon Rainforest:** Moving toward a tipping point between carbon sink and carbon source.
- **Permafrost melt:** Releasing methane at rates not fully captured in models.

Tipping points interact: one can trigger another, creating **tipping cascades** analogous to the interconnected failures that propagated the 2007–08 global financial crisis. This is the central non-linearity that current climate scenarios – and most corporate risk assessments – do not adequately represent.

From a Planetary Solvency standpoint – applying actuarial solvency standards to the climate system – the current position is:

Risk Indicator	Status	Direction
Global temperature (2023–25 average)	~1.47°C above pre-industrial	↑ Accelerating
Earth's Energy Imbalance	Highest in 65-year record	↑ Rising
Climate sensitivity evidence	Points to high end of IPCC range	⚠ Model risk
Planetary boundaries transgressed	7 of 9	↑ Worsening
Tipping elements in danger zone	Multiple, incl. AMOC, Amazon	↑ Deteriorating
Insurance loss trend	+5–7% per annum; near-doubled since 2015	↑ Accelerating

The overall assessment, as published in the IFoA Planetary Solvency Systemic Risk Dashboard (Q1 2026): **Severe and Deteriorating.**<sup>1</sup>

---

<sup>1</sup> This briefing draws on IFoA Parasol Lost (January 2026), IFoA Climate Scorpion (March 2024), the IFoA Planetary Solvency Systemic Risk Dashboard Q1 2026, WMO State of the Global Climate 2025, Carbon Brief State of the Climate 2026, and the Global Tipping Points Report 2025.