INVESTOR BRIEFING

INSTITUTIONAL INVESTOR ACTION ON CLIMATE RISK AS THE WORLD APPROACHES THE 1.5°C LIMIT OF THE PARIS AGREEMENT

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To inform this paper, individual PRI signatory members of the following groups were consulted: the UN-Convened Net Zero Asset Owner Alliance Steering Group and the Net Zero Asset Managers Initiative Advisory Group. Except where stated otherwise, the opinions, recommendations and findings expressed are those of PRI Association alone, and do not necessarily represent the views of the contributors or PRI signatories (individually or as a whole). It should not be inferred that any third-party referenced endorses or agrees with the contents hereof. PRI Association is committed to compliance with all applicable laws and does not seek, require or endorse individual or collective decision-making or action that is not in compliance with those laws.

An investor initiative in partnership with UNEP Finance Initiative and UN Global Compact

ABOUT THE PRI

The Principles for Responsible Investment (PRI) works with its international network of signatories to put the six principles for responsible investment into practice. Its goals are to understand the investment implications of environmental, social and governance (ESG) issues and support signatories in integrating these issues into investment and ownership decisions. The PRI acts in the long-term interests of its signatories, the financial markets and economies in which they operate, and ultimately the environment and society as a whole.

The six principles for responsible investment are a voluntary and aspirational set of investment principles that offer a menu of possible actions for incorporating ESG issues into investment practice. The principles were developed by investors, for investors. In implementing them, signatories contribute to developing a more sustainable global financial system. For more information, visit www.unpri.org.

ABOUT THIS BRIEFING

Following recent record-breaking climate disruption, this investor briefing examines the latest state of knowledge on how climate change is translating to financial risks and how investors can respond to these risks. Drawing on recent years of practice, it proposes a renewed focus on proven levers of action and increased engagement with policy makers to enable a timely transition to net zero. It will hold interest to asset owners, managers, and policy makers in all regions seeking to understand how investor action can evolve to keep pace with a rapidly changing profile of climate risks.

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EXECUTIVE SUMMARY

The world faces a deepening climate crisis. Almost a decade after the Paris Agreement, efforts to limit warming to 1.5°C remain far off track, and potentially catastrophic risks lie ahead. Worsening climate extremes, the threat of accelerated warming, and rising geopolitical tensions place new pressures on institutional investors as they seek to safeguard beneficiaries' long-term interests.

It is not too late to avoid the most catastrophic climate outcomes. Investors have a crucial role to play in responding to the risks of the moment and fulfilling their duties to clients and beneficiaries.

Key insights from this paper include:

- **Climate risks have been underestimated and now threaten investors' core business.** Increasing evidence shows how physical climate impacts are affecting assets' values. Transition risks are expected to intensify as governments respond to worsening losses and impacts. The latest climate science now raises the prospect of an acceleration in warming if 1.5°C is passed, with permanent changes in the Earth system posing systemic threats to the continued viability of the financial sector and the global economy more broadly.
- **A global transition response is now underway, albeit unevenly**: Investments in renewables reached a record $2.1 trillion in 2024, and coal growth slowed to its lowest in 20 years. The global transition response is progressing unevenly, especially as new political and economic volatility threatens to impede progress towards decarbonisation in some regions.
- **In an era of disruption and uncertainty, investors can adopt a strategic ambition aimed at stabilising temperature rise at or below 1.5°C to avoid the most catastrophic climate outcomes and financial risks.** A long-term focus on climate-related risks and transition opportunities can position investors to safeguard beneficiary interests in a rapidly changing world. However, investors could be forced to recalibrate investment strategy and near-term net zero targets if ineffective government policy further delays real-world decarbonisation.
- **Investors can identify growth opportunities in the transition while seeking new information on corporate transition planning**. Climate solutions, transition, and adaptation finance offer opportunities for investors, especially when supported by policy incentives. While corporate engagement has limits, investors can gain insights into how companies plan to generate long-term value in a disrupted future with heightened risks.
- **Now and in the years ahead, policy engagement on climate will be one of the most critical levers for investors seeking to manage systemic risks and safeguard the long-term interests of beneficiaries.** Investors can benefit from positioning and resourcing climate-related policy engagement as a core component of their investment strategy, ensuring that proactive engagement is based on positions aligned with their long-term goals.
- **PRI offers a wide range of opportunities through which signatories can strengthen their policy engagement efforts and build the necessary wider capabilities to manage the risks and opportunities in the transition to net zero in the critical years ahead.**

THE CLIMATE CRISIS IS DEEPENING

INTRODUCTION

Almost ten years after the signing of the Paris Agreement, a deepening climate crisis threatens institutional investors' core business of securing long-term returns for clients, savers, and beneficiaries. Global temperatures are breaking records, climate-related extremes are causing higher economic losses, and climate risks are beginning to affect portfolios. Despite progress in government commitments to net zero in recent years and investment in clean energy reaching record levels, the economic transition is progressing unevenly, and global emissions are yet to fall.

In the coming years, worsening climate change is likely to bring increasing risks, uncertainty, and volatility, including system-wide risks to economies and the financial system that investors cannot diversify away from. Institutional investors have a duty to assess and manage these risks.

This paper aims to analyse what is at stake for institutional investors as they navigate these worsening risks in the coming years. Following this introduction, Section 2 reviews the latest state of knowledge on climate science and observed impacts. Section 3 discusses how these impacts are translating to financial risks and how these risks are expected to evolve. Finally, Section 4 discusses the levers that investors can use to keep pace with the urgency of the crisis and the risks ahead.

THE CLIMATE SYSTEM IS ENTERING UNKNOWN TERRITORY

In 2018, at the request of governments, the Intergovernmental Panel on Climate Change (IPCC) issued a special report to inform policy makers of the risks of warming of 1.5°C and explore strategies to limit warming to this threshold.[1] The report studied how exceeding 1.5°C would increase the risks of severe impacts on food security, water availability, human health, climate-induced migration, and economic instability. These risks transmit to all economic sectors and across global supply chains, making them relevant from an investment perspective. The current unprecedented loss of biodiversity compounds these risks, weakening the productivity and resilience of the ecosystems underpinning those economic sectors.[2] The IPCC report provided a scientific foundation in support of the Paris Agreement's goal of "*holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels*" in the recognition that this would "*significantly reduce the risks and impacts of climate change*". From a risk perspective, the science has long been clear in indicating that the severity of climate impacts increases between 1.5°C and 2°C.

In recent years, the scientific community has issued increasingly urgent warnings about the accelerating pace and escalating risks of climate change. The IPCC Sixth Assessment Report warned of a "last chance" to avoid the most severe impacts, underscoring that the world is likely to exceed the critical 1.5°C warming threshold in the near term without immediate and deep emissions reductions.[3] Leading scientists have called for unprecedented policy action, investment shifts, and adaptation efforts to mitigate catastrophic outcomes in a "code red" for humanity.[4] In 2024, Prof. Sir Jim Skea, IPCC Chair, expressed concern at the rate of warming, stating that the world is entering "unknown territory" and emphasising the urgent need for adaptation to current and future impacts.[5]

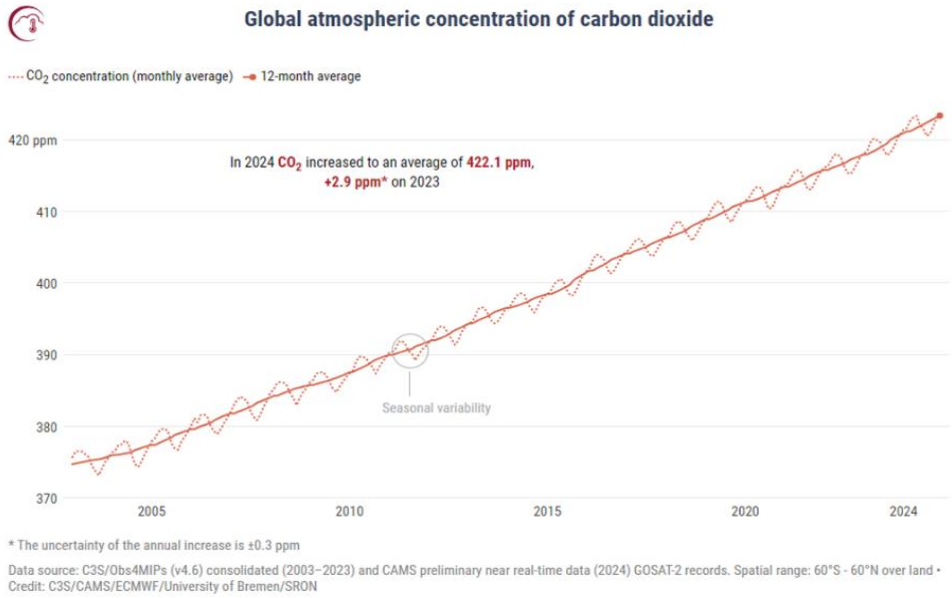
In 2024, warming exceeded 1.55°C above pre-industrial averages over a 12-month period, marking the hottest year in global temperature data going back to 1850 and likely in the last 100,000 years.[6,7] These trends were accompanied by record-breaking rainfall and flooding, intensifying tropical

[1] IPCC (2018), Summary for policymakers
[2] IPBES (2019), Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
[3] IPCC (2023), *Climate Change 2023: Synthesis Report*
[4] United Nations (2021), IPCC Report: Code 'red' for human-driven global heating, warns UN Chief
[5] Financial Times (2024), World in 'unknown territory' after heat records, says head of UN's climate body
[6] World Meteorological Organisation (2025), WMO confirms 2024 as warmest year on record at about 1.55°C above pre-industrial level
[7] Copernicus (2025), 2024 is the first year to exceed 1.5°C above pre-industrial level

cyclones, heatwaves, droughts, and wildfires. Antarctic and Arctic Sea ice areas were well below average, underscoring the ongoing impacts of climate change on polar regions.

Passing the 1.5°C limit risks triggering multiple tipping points, some possibly already underway, emphasising the urgency of limiting warming to avoid cascading feedback. Exceeding warming of 1.5°C above pre-industrial levels increases the risk of triggering thresholds beyond which the Earth system might experience abrupt and irreversible changes. Armstrong McKay et al. (2022) identify key tipping elements—such as the collapse of the Greenland and West Antarctic ice sheets, the destabilisation of permafrost carbon stores, and the dieback of the Amazon—that could be triggered at 1.5°C of warming. Indeed, some might already be at risk above 1.0C.[8]

Emissions continue to rise, contributing to further locked-in global temperature rise and concerns of a breach of 1.5°C. In 2024, atmospheric carbon dioxide (CO_2) concentrations reached 422.1 parts per million (ppm).[9] Many analyses suggest that energy-related emissions might soon peak, although the pace of reduction could be too slow to prevent higher warming and risks.[10,11]



Box 1: Average warming may breach 1.5°C in the coming years

Climate scientists tend to measure temperature rise over several decades rather than isolated years, to account for variation. While the Paris Agreement is not explicit about how current levels of long-term warming should be assessed, scientists typically use 20-year averages. The backwards looking decadal average for 2015–2024 is 1.3°C above pre-industrial levels.[5] Taking the present as a mid-point, it is reasonable to anticipate that the 20-year average temperature for 2015–2034 would exceed 1.5°C without immediate accelerated action.

Regarding longer-term prospects of temperature rise or stabilisation, future climate changes are directly proportional to cumulative CO_2 emissions. In the late 2000s, climate scientists popularised the concept of a "carbon budget" as a total volume of CO_2 emissions that could be released over time into the atmosphere while limiting global warming to a specific temperature threshold. For a 67% probability of remaining within 1.5°C of warming above pre-industrial levels, the carbon budget for 2020 onwards was approximately 400 $GtCO_2$. As of January 2025, the remaining budget for this level of probability stands at approximately 200 $GtCO_2$. With current levels of emissions, this budget would be exhausted within approximately five years, committing the planet to significantly higher warming trajectories.

[8] Science (2022), Exceeding 1.5°C global warming could trigger multiple climate tipping points
[9] Global Carbon Budget (2025), The critical annual update revealing the latest trends in global carbon emissions
[10] DNV (2024), Energy Transition Outlook 2024
[11] World Economic Forum (2024), Peak energy emissions is here — but the work is not yet over

A GLOBAL TRANSITION TOWARDS NET ZERO IS UNDERWAY

A global transition towards net zero is underway but proceeding unevenly across markets. Over the past decade, investment in low-carbon energy has increased, reaching a record $2.1 trillion in 2024.[12] Global annual renewable power capacity additions have grown steadily over that time, reaching a total capacity of 4,448 GW and recording an annual growth rate of 15.1% in 2024.[13] While annual growth falls short of the rate required to meet the global goal of tripling capacity by 2030 that governments agreed to at COP28 in 2023, this growth demonstrates momentum in renewable capacity build-out. Renewable energy is now also increasingly competitive with power generation from fossil fuels and has contributed to energy security in a time of volatile fossil fuel prices.[14]

Despite the growth in clean energy, the transition away from fossil fuels is not yet progressing as required. Globally, the growth in coal power additions slowed to its lowest level in 20 years. Outside of China, coal power capacity decreased by 9.2 GW, as retirements (22.8 GW) exceeded new additions (13.5 GW) in the rest of the world. In the EU27, retirements quadrupled year over year, reaching 11 GW, while the UK shut down its last coal plant, becoming the sixth country to complete a coal phase-out since 2015.[15] However, China and India are outliers in driving large-scale coal power, with China in particular seeing a surge in new coal plant construction after an unprecedented permitting boom in 2022 and 2023, during which more than 200 GW of coal capacity was approved, more than the size of the entire US coal fleet. In 2024, almost half of that capacity moved into construction, reflecting the country's highest level of new coal plant construction since 2015.

Natural gas demand rose by 2.8% in 2024, above the average growth rate of 2% from 2010 to 2020 and driven by growth in fast-growing markets in Asia.[16] By contrast, oil demand has shown signs of plateauing, with the International Energy Agency (IEA) forecasting a peak in demand by the end of this decade before a permanent decline in line with changing demand patterns. This forecast partly depends on the stringency of policy measures, with some oil majors anticipating that demand could remain high until the 2030s.[17,18]

Agriculture, forestry, and other land uses are also critical to the net zero transition as they comprise more than one-fifth of total emissions, half of which come from deforestation and land conversion. Efforts to address deforestation have gathered pace, including through the Glasgow Leaders' Declaration on Forests and Land Use in 2021, which sought to halt and reverse deforestation by 2030. Despite reductions in primary forest loss in South America—36% in Brazil and 49% in Colombia in 2023—agricultural expansion and wildfires are preventing further progress, which is far off track.[19]

In the years ahead, the transition is likely to be characterised by uneven progress. Geopolitical uncertainties could fragment global supply chains for technologies and critical minerals, delaying deployment of clean energy in some markets. At the same time, many countries are looking to boost energy security and affordability through clean energy investment and a reduced dependence on fossil fuel imports.[20] China—the world's largest emitter—has signalled a commitment to multilateralism on the climate crisis and plans to issue an ambitious national transition plan that covers the whole economy.[21] Across the G20 more broadly, policy experts surveyed by the PRI-commissioned Inevitable Policy Response (IPR) expect that governments will soon accelerate the transition as climate impacts worsen, through a policy response to a deepening crisis.[22]

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[12] BNEF (2025) Global Investment in the Energy Transition Exceeded $2 Trillion for the First Time in 2024
[13] IRENA (2025) Record-Breaking Annual Growth in Renewable Power Capacity
[14] IRENA (2024) Renewable Power Generation Costs in 2023
[15] Global Energy Monitor (2025) Boom and Bust Coal 2025
[16] IEA (2025) Global gas balance set to remain fragile in 2025 as growing demand meets tight supply
[17] Total Energies (2024), Energy Outlook 2024
[18] ExxonMobil (2024), Global Outlook: Our view to 2050
[19] WRI (2024), Brazil and Colombia See Dramatic Reductions in Forest Loss
[20] Nature Climate Change (2025), Trade risks to energy security in net-zero scenarios
[21] UN (2025), Secretary-General's Press Encounter on Climate
[22] IPR (2025), 2025 Transition Forecast

CLIMATE RISKS ARE EVOLVING

A DUTY TO ACT ON PRESENT AND FORESEEABLE RISKS

A substantial body of evidence—including assessments by central banks, supervisors, and scientific authorities—shows that climate change is beginning to affect asset prices and will continue to do so with further climate change. Climate issues thus fall within institutional investors' responsibilities—variously referred to as fiduciary duties, duties of loyalty and prudence, or best-interest obligations—which require them to identify and manage present and reasonably foreseeable risks.[23] Multiple central banks and supervisory bodies have recognised climate change as a threat to financial stability, underscoring the importance of integrating climate considerations into investment decision-making. In its "Green Swan" report in 2020, the Bank for International Settlements highlighted the risk of sudden and severe market disruptions if climate policies are delayed or physical impacts intensify more quickly than anticipated.[24] In addition, economic research points to the risk of a climate-driven market correction, in which carbon-intensive assets could abruptly lose value once markets internalise the full extent of climate-related financial risks.[25,26] A climate-driven market failure might incur losses beyond levels that governments can absorb and lead to significant failures across certain aspects of the financial system, including the viability of insurance.

Box 2: Climate change poses a range of present and foreseeable risks

Physical risk refers to the risks resulting from climate change, which can be event-driven (acute) or longer-term shifts (chronic) in climate patterns. Physical risks might have financial implications for organisations, such as direct damage to assets and indirect impacts from supply chain effects.

Transition risk refers to risks resulting from the transition to a low-carbon economy, which might entail extensive policy, legal, technology, and market changes to address mitigation and adaptation requirements related to climate change. Transition risks might pose varying levels of financial and reputational risk to organisations depending on the nature, speed, and focus of these changes.

Systematic risk (interchangeable with 'market risk' or 'market-wide risk') refers to risks transmitted through financial markets and economies that affect aggregate outcomes, such as broad market returns. Because systematic risk occurs at a scale greater than a single company, sector, or geography, it cannot be hedged or mitigated through diversification.

Systemic risk is the risk of a breakdown of an entire system—rather than the failure of individual parts—due to the interconnectedness and interdependencies of the system.

While each investor ultimately determines materiality based on their own circumstances, extensive peer-reviewed literature from the Earth sciences and financial authority risk assessments indicate that climate change poses present and foreseeable physical, transition, and liability risks across asset classes. Regulators in multiple jurisdictions now view climate risks as financially material, reinforcing the notion that investors who integrate these factors into their risk management frameworks are exercising prudent governance in pursuit of maximised risk-adjusted returns over the long term.

Asset owners—including pension funds, endowments, and sovereign wealth funds—are bound by fiduciary duties, often framed in terms of prudence, loyalty, and acting in beneficiaries' best interests. These duties require asset owners to identify, assess, and manage all material financial risks, including present and foreseeable risks from climate change to asset valuations, cash flows, and long-term portfolio stability.[27] Failure to incorporate climate-related risks into investment strategies could be at odds with those duties if it implies neglecting foreseeable threats to portfolio performance. Asset owners can use

[23] UNEP FI (2024), A Legal Framework for Impact: Summary report
[24] BIS (2020), The green swan - Central banking and financial stability in the age of climate change
[25] SSRN (2024), Climate Minsky Moments and Endogenous Financial Crises
[26] Grantham Research Institute on Climate Change and the Environment (2022), Preventing a 'climate Minsky moment'
[27] Financial Markets Law Committee (2024), Pension Fund Trustees and Fiduciary Duties – Decision-making in the context of Sustainability and the subject of Climate Change

several levers (discussed in Section 3) to ensure that their portfolios are positioned to be resilient and protect the financial interests of beneficiaries as climate risks evolve.

Investment managers acting under contractual and regulatory frameworks are likewise expected to integrate all material risks—climate-related or otherwise—into their investment strategy and processes. While specific risk assessment methodologies vary, many managers incorporate tools such as stress testing or scenario analysis to assess how physical and transition risks could influence both short-term performance and long-term asset values under a range of plausible futures. However, in practice, these tools are often applied primarily for disclosure and compliance purposes, and their influence on actual investment decision-making can be limited. Investment managers also have an interest in the stability of financial markets. By communicating transparently about how their assessment of climate risks shapes their investment judgements—including system-wide risks to economies and markets—investment managers can demonstrate good governance, comply with emerging regulation, and uphold their duty to act in the best interests of their clients.

HOW CLIMATE CHANGE IMPACTS THE GLOBAL ECONOMY

In recent years, increasingly sophisticated economic studies of the impact of climate change have incorporated nonlinear risks and interdependencies, revealing a systematic underestimation of projected economic losses and stability risks from climate change. For example, in 2024, an economic analysis by the Network for Greening the Financial System (NGFS)—a coalition of central banks and financial supervisors examining the financial sector's role in managing climate risks—suggested that climate impacts could result in economic losses amounting to 30% of GDP by 2100.[28,29] This estimate does not account for tipping points and feedback loops that could exacerbate warming and its economic impacts, nor the uncertainties associated with the carbon storage capacity of increasingly degraded ecosystems such as forests, peatlands, or oceans.[30] The absence of these factors in economic studies is potentially leading policy makers to underestimate the severity of risks and causing delays in the policy response required to mitigate climate risks.

Similarly, a 2025 study by the Institute and Faculty of Actuaries (IFoA) critiques earlier economic assessments for downplaying the most severe impacts of climate change, shielding policy makers from the immense risks posed by current policy trajectories.[31] The actuarial risk-led approach suggests that the global economy could face a significant contraction in the latter half of the century without an immediate policy response, with an intensification of food system shocks, water insecurity, heat stress, infectious diseases, mass mortality, displacement, and escalating conflict. The economic impacts of climate change significantly depend on the timing of mitigation through the transition to net zero, as well as the effectiveness of adaptation measures to cope with climate impacts.

THE RELEVANCE OF PHYSICAL RISKS TO INVESTORS

Physical risks from climate change—such as extreme weather events, floods, and sea-level rise—pose threats to the stability of key industries and supply chains. [32] These risks are already affecting equity markets.[33] In a global study examining financial data from over 17,000 firms across 93 countries, additional exposure to extreme heat was already found to be quantifiably affecting financial performance relative to analyst predictions, with effects pronounced in industries reliant on outdoor labour, infrastructure, or temperature-sensitive supply chains.[34] A growing number of studies are uncovering

[28] NGFS (2024) NGFS, 2024. NGFS long-term scenarios for central banks and supervisors
[29] Nature (2024) The economic commitment of climate change
[30] National Science Review (2024) Low latency carbon budget analysis reveals a large decline of the land carbon sink in 2023.
[31] Institute and Faculty of Actuaries (2025), Current climate policies risk catastrophic societal and economic impacts
[32] TCFD (2017), Recommendations of the Taskforce on Climate-related Financial Disclosures
[33] EDHEC Risk Climate Impact Institute (2025), Climate shocks or the death by a thousand cuts? The effect of climate change on the valuation of equity assets
[34] SSRN (2019), Climate Change, Firm Performance, and Investor Surprises

evidence that the market might be pricing in extreme weather.[35,36] While the effects across sectors are uneven, climate change is now having financial impacts on companies.

In terms of fixed income, climate change is affecting credit risk assessments and asset valuations. Rising physical risks—such as sea-level rise and extreme weather events—are increasingly reflected in the pricing of municipal and sovereign bonds. Studies by the International Monetary Fund and the Asian Development Bank Institute indicate that climate vulnerability directly elevates borrowing costs: in emerging markets, a 1% increase in climate vulnerability is associated with a 3.1% rise in government bond spreads, and high-risk economies have seen premiums reach as high as 275 basis points.[37,38] Research on the US municipal bond market—specifically school district bonds—documents that municipal bond credit spreads have widened by 5.3 basis points for every 10% increase in properties exposed to six feet of sea-level rise since 2011.[39] This risk is particularly pronounced for bonds reliant on local tax bases, such as school district bonds, where real estate values directly influence repayment capacity because US schools are largely funded through local property taxes. These findings underscore how climate risks to fixed income are already material to many investors, and that climate impacts are likely to further influence long term asset valuations.

Climate change is also affecting real assets—including real estate and infrastructure—through physical risks that are increasingly reflected in valuations. Physical risks might threaten critical infrastructure assets, including transportation, energy grids, and water systems, reducing their lifespan and financial viability. In real estate, recent estimates suggest that flood-exposed properties in the US might be collectively overvalued by up to $187 billion, highlighting insufficient pricing of future flood damage.[40] Localised studies show related trends for other extremes: Hurricanes Harvey and Sandy drove 4.9–8.1% discounts in commercial real estate transaction prices, and in California, major wildfires between 2016 and 2021 resulted in an average 2.2% price decline in nearby neighbourhoods.[41,42] These findings underscore the rising risks that climate change poses to real assets as direct physical damages and evolving risk perceptions continue to reshape market pricing.

THE RELEVANCE OF TRANSITION RISKS TO INVESTORS

In the years ahead, the global economic transition towards net zero is expected to present significant transition risks to asset valuations, driven by regulatory changes, technological advances, and shifting consumer preferences. Across many sectors, these risks have not yet materialised due to delayed action by governments to deliver on their national climate commitments. As governments accelerate the policy response to climate change—likely driven by worsening climate impacts and extreme weather—transition risks are expected to more fully materialise in sectors that are dependent on fossil fuels, with many coal, oil, gas, and industrial assets becoming less viable.

Automakers reliant on internal combustion engines (ICEs) already face growing policy mandates, such as the European Union 2035 phase-out, technology disruption, and shifting consumer demand. Similarly, the phase-out of freely allocated emissions allowances under the European Emissions Trading Scheme (ETS) and the levy on embedded emissions in imported goods through the EU Carbon Border Adjustment Mechanism (EU CBAM) pose stranded asset risks across cement, steel, and industries that do not invest in the transition to cleaner technology in the coming years.[43,44]

[35] SSRN (2021), Extreme Weather Risk and the Cross-Section of Stock Returns
[36] Federal Reserve Bank of San Francisco (2024), Extreme Weather and Financial Market Uncertainty
[37] Science Direct (2022), This changes everything: Climate shocks and sovereign bonds
[38] ADBI (2020), Feeling the Heat: Climate Risks and the Cost of Sovereign Borrowing
[39] NBER (2022), Sea Level Rise Exposure and Municipal Bond Yields
[40] Nature climate change (2023), Unpriced climate risk and the potential consequences of overvaluation in US housing markets
[41] Journal of Regional Science (2024), Quantifying the impacts of climate shocks in commercial real estate markets
[42] Science Direct (2024), Climate change and real estate markets: An empirical study of the impacts of wildfires on home values in California
[43] Publications Office of the European Union (2023), Decarbonisation options for the cement industry
[44] The Carbon Trust (2024), CBAM: What it means for importers and exporters of steel, iron and aluminium

Sectors in the value chains of deforestation-risk commodities—cattle, wood, cocoa, soy, palm oil, coffee, and rubber—are also facing increased expectations on due diligence and disclosure, such as through the European Union Regulation on Deforestation-free products (EUDR).[45]

Looking further ahead, a 2025 UK Sustainable Investment and Finance Association (UK SIF) study predicts an estimated $2.28 trillion in stranded assets globally by 2050, concentrated in the US, Russia, and China.[46] The EDHEC-Risk Climate Impact Institute estimates that global equity losses could exceed 50% this century without an acceleration in emissions reductions.[47]

THE EMERGING LANDSCAPE OF LIABILITY RISKS

Liability risks from climate change—the potential for legal claims arising from inadequate mitigation, disclosure, or adaptation efforts—could also become relevant to asset owners and managers.[48] A recent UNEP analysis documented an increasing number of cases filed globally, underscoring how legal actions are seeking to hold companies accountable for climate risk management practices.[49] In major economies, high-profile cases could influence future litigation and regulation, affecting asset valuations and corporate governance. Although the full scope of these emerging risks remains uncertain—given evolving legal interpretations and regulatory frameworks—the potential for reputational damage and disruptions to asset valuations exists. It will be important for investors to keep abreast of climate-related liability risks in the years to come.

SYSTEM-WIDE EFFECTS OF RISKS

Systemic risks can arise from a convergence of physical and transition impacts that extend beyond individual sectors or regions and can cause broad market disruptions, exacerbating economic shocks and amplifying the financial challenges facing institutional investors. [50,51] The insurance sector is particularly vulnerable to climate risks, with studies showing that climate extremes could lead to losses that are increasingly uninsurable and render essential financial services unviable. A notable example is the recent exit of major insurers from fire- and flood-prone areas in the US, leaving homeowners with limited coverage and affecting home valuations. With climate-related disasters on the rise, insurance executives are increasingly re-evaluating their exposure to high-risk areas as they view climate change as a driver of financial instability.[52,53,54,55]

Such risks extend far beyond one-off market adjustments and could cascade across sectors across the whole economy. In turn, such widespread uncovered losses could significantly affect growth, inflation, credit supply, and financial resilience.[56] The increasing severity and frequency of extreme weather events—with several countries experiencing their most expensive weather events on record in 2023—calls into doubt governments' ability to step in where private insurance will not.[57] As the IPCC has cautioned, there are physical limits to adaptation beyond which climate risks are no longer manageable, cannot be avoided, and could be potentially catastrophic.[58,59]

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[45] European Commission (2025), EU Regulation on Deforestation-free Products
[46] UKSIF (2025), UK Economy Heading for $141 Billion Loss Caused by Stranded Fossil Fuel Assets, With Pension Funds on Track to Lose $19 Billion
[47] EDHEC Climate Risk Impact Institute (2024), Climate-related global equity losses could "exceed 50%"
[48] UNEP (2023), Climate litigation more than doubles in five years, now a key tool in delivering climate justice
[49] UNEP (2023), Global Climate Litigation Report: 2023 Status Review
[50] UNPRI (2024), Investing for sustainability impact
[51] TCFD (2017), Recommendations of the Taskforce on Climate-related Financial Disclosures
[52] S&P Global (2025) The Mounting Cost of Climate for Insurers | S&P Global
[53] CNBC (2024), Insurers such as state farm and allstate are leaving fire- and flood-prone areas. Home values could take a hit are leaving fire- and flood-prone areas. Home values could take a hit
[54] State Farm (2025), State Farm in California – Understanding the issues
[55] First Street (2023), The insurance issue
[56] Green Central Banking (2024), Insurance, climate losses, and solutions for enhancing resilience
[57] Yale Climate Connections (2024), A record 63 billion-dollar weather disasters hit earth in 2023
[58] Thallinger, Gunther (2025), Climate, risk, insurance: the future of capitalism
[59] IPCC (2014), Adaptation Opportunities, Constraints, and Limits

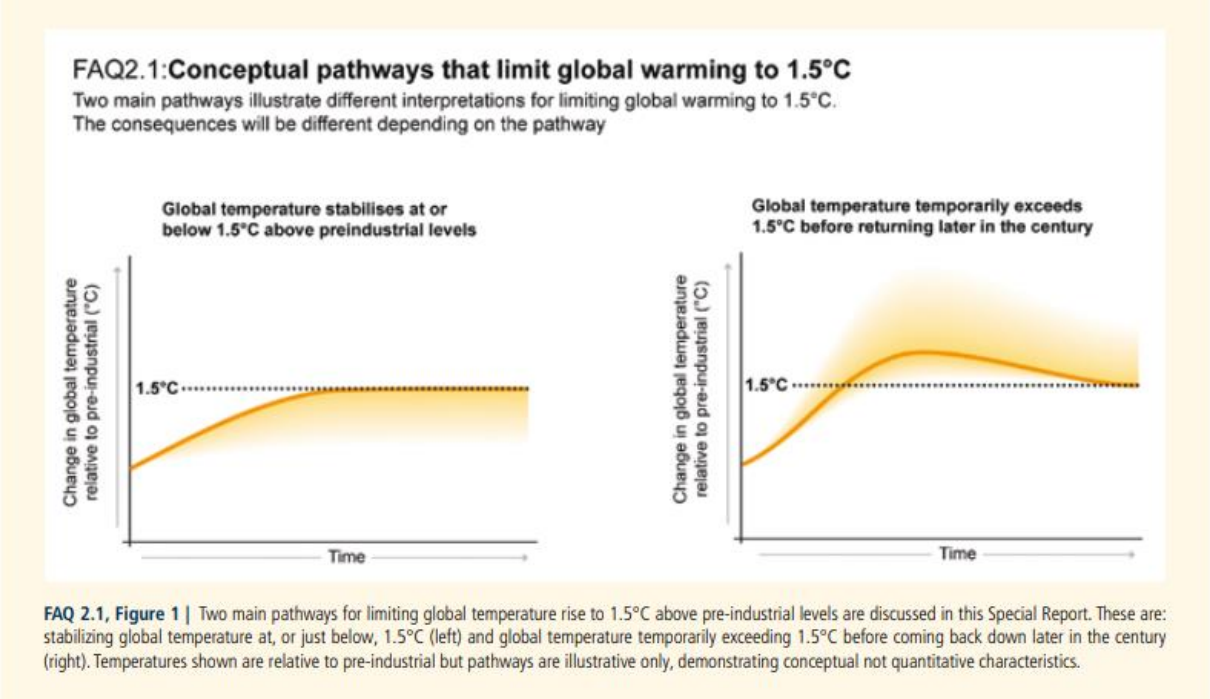
HOW INVESTORS CAN RESPOND

INVESTOR STRATEGY IN RELATION TO 1.5°C

Investors have a financial interest in long-term warming being limited as low as possible, given that temperature stabilisation at or below 1.5°C significantly reduces the risks of economic disruption, supply chain shocks, stranded assets, and market instability.

Over recent years, investors have implemented several approaches to managing climate risks, including through capital allocation, corporate engagement, and engaging government policy makers on the many barriers to the net zero transition.[60,61] In an era of increasing climate disruption, the investment industry can build on these approaches to keep pace with the evolving profile of risks and the urgency and scale of the challenges ahead. Despite the increasing likelihood of a near-term breach of the 1.5°C limit of the Paris Agreement, a long-term view continues to stress that temperature stabilisation at or below that level avoids the most catastrophic climate outcomes and financial risks. An extract from the IPCC Special Report on 1.5°C below proposes a stylised view of the temperature pathway in which a delayed net zero transition leads to an overshoot beyond 1.5°C before net zero is reached and temperatures are stabilised. These pathways carry higher risks than those that avoid overshoot but become more likely the longer the net zero transition is delayed.

Many investors implement their management of climate risk by articulating a range of net zero targets to calibrate near- and long-term ambition and assess progress. These targets establish a common framing of desired investment portfolio outcomes over time and enable strategy-setting performance assessment. With delays in government policy implementation, investors might need to rearticulate net zero targets periodically with reference to updated emission pathways that recognise the delayed transition, overshoot beyond 1.5°C, and the need to stabilise temperatures through net negative emissions in the interests of managing systemic risk. This would mark an evolution from currently dominant pathways for target setting that use “1.5°C no/low overshoot scenarios”.



FAQ 2.1, Figure 1 | Two main pathways for limiting global temperature rise to 1.5°C above pre-industrial levels are discussed in this Special Report. These are: stabilizing global temperature at, or just below, 1.5°C (left) and global temperature temporarily exceeding 1.5°C before coming back down later in the century (right). Temperatures shown are relative to pre-industrial but pathways are illustrative only, demonstrating conceptual not quantitative characteristics.

[60] UN PRI (2024), What is system-level investing?
[61] NZAOA (2024), Target setting protocol background document

In theory, a wide range of potential pathways exist to transition towards a net zero global economy. Some investors might have strong conviction in a specific view of how the net zero transition will unfold as governments ramp up policy efforts to manage rising risks and deliver on the Paris Agreement goals. For instance, some have in-house research teams monitoring technology and policy developments and articulating their own views on how they expect the transition will unfold. Others find benefit from open-source assessments of the unfolding transition such as the IPR research consortium, which provides investor-relevant insights on how sectors and markets are expected to transform in the coming decades.

In their investment strategy, investors with a strong conviction view on the transition might draw from a range of net zero pathways aligned with Paris Agreement goals, while recognising that 1.5°C pathways are those that most effectively minimise risks. Those investors will also benefit from considering how physical risks will evolve in a warmer world and how their strategy will generate long-term value in a more volatile future. Transparency around how risks will be managed in a range of plausible futures can increase confidence in generating long-term value in line with client demands.

CLIMATE SOLUTIONS, TRANSITION, AND ADAPTATION

In an era of increasing climate disruption, climate solutions, transition and adaptation finance offer institutional investors a means of capturing new growth opportunities. The IEA estimates that achieving global net zero emissions by mid-century in line with limiting warming to 1.5°C will require approximately $4 trillion in annual clean energy investments by 2030, while capital expenditures in transition-aligned industries—including low-carbon cement, green steel, and sustainable aviation fuels—might exceed $3 trillion globally by the end of this decade. [62] Many asset owners are already directing significant capital towards renewables, electrification, and energy efficiency, with a renewed focus on employing transition finance to decarbonise high-emitting sectors.

From a risk management perspective, these strategies help to reduce exposure to assets that are likely to become stranded in the years ahead as the global economy transitions, while tapping into high-growth markets supported by policy incentives. The benefits for investors focusing on climate and transition investments include potential long-term outperformance in sectors where technological advancements and consumer demand converge, along with resilience to future policy shocks.

Nevertheless, challenges again persist here as taxonomies for climate solutions and transition finance remain inconsistent, data and measurement tools are still evolving, and policy uncertainty can slow the scaling of promising solutions. Looking ahead, the IPCC's assessments confirm that negative emissions are critical in all 1.5°C pathways, leading to greater investor attention on policy and finance for preserving and restoring natural carbon storage via nature-based solutions, as well as policy, technology, and the financing of technological solutions. Uncertainties exist around feasibility, cost, and verification for engineered removals. Investors will benefit from engaging early with emerging solutions to close policy gaps and develop the market infrastructure required to direct capital effectively to climate and transition solutions as part of a strategy of pursuing long-term returns.

Investing in climate adaptation solutions might also present growth opportunities for investors seeking both risk mitigation and long-term returns. Global adaptation financing needs—some of which represent investment opportunities—could run into trillions of dollars by 2030, particularly in critical sectors such as infrastructure, agriculture, and water resource management. Recent work integrating adaptation into physical risk models underscores that building resilience—whether through flood defences, drought-resistant crops, or weather-resilient logistics—can help to protect asset values against increasingly frequent extreme weather events. Companies with robust adaptation plans can reduce operational disruptions and safeguard supply chains, translating into stronger valuations.

The coming years might create new opportunities for private capital to partner with local governments or development finance institutions in emerging markets, which typically face financing gaps for critical infrastructure upgrades. Building confidence in capital allocation for adaptation will depend on fundamental research and efforts to articulate the business case of adaptation interventions.

[62] WEF (2023), Clean energy investment must reach $4.5 trillion per year by 2030 to limit global warming to 1.5°C

THE POTENTIAL OF SECTOR-SPECIFIC DECARBONISATION

With the transition progressing unevenly, sector decarbonisation holds promise as a lever to drive emissions reductions in the real economy where carbon intensity is highest, such as in power generation, transport, cement, steel, and agriculture. Encouragingly, some of these sectors are increasingly decarbonisation-ready, meaning that lower-carbon technologies are increasingly available. Investors can effectively assess progress, reduce transition risk, and direct capital towards decarbonisation solutions with clear impact by engaging with companies on detailed, science-based transition pathways for their most emission-intensive holdings.

Despite the growing adoption of this approach, policy uncertainty complicates sectoral target-setting as different regions transition unevenly, creating complexity for companies operating internationally. These complexities can be approached by using sectoral pathways tied to recognised scenarios, along with engagement strategies that examine company efforts to develop credible transition plans.

Looking ahead, national-scale sectoral pathways can help to support investors' informed decisions. When governments provide detailed, forward-looking roadmaps for decarbonising major industries—supported by consistent regulations, incentives, and infrastructure investments—investors gain greater confidence in aligning their capital with long-term climate goals. For instance, clear policy frameworks on grid decarbonisation, sustainable aviation fuels, sustainable agriculture, or negative emissions solutions can de-risk private investment. Investor engagement with policy makers to develop these sectoral frameworks can reduce the uncertainty associated with transition risk and help to ensure that asset allocations support emissions reductions on a meaningful scale.

CORPORATE ENGAGEMENT ON NEW RISKS AND SOLUTIONS

In an era of increasing climate disruption, investors can deepen engagement to examine how companies are positioned to thrive in an economic transition with worsening physical impacts. Investors can recognise the challenges and risks ahead and build on existing engagement practices to request information from investee companies on how those companies aim to generate long-term value under plausible scenarios of heightened physical risk—where worsening climate impacts could significantly alter asset values—and in a transition where policy and technological shifts can render business models obsolete in the absence of effective transition plans. When companies are unable to demonstrate effective management of climate risks, investors can employ a range of strategies to signal to management their concerns that such risks might erode performance and threaten returns.

Even as the world experiences record-breaking climatic changes, investor engagement efforts are facing pushback from political interests acting in support of incumbent industries. In this regard, investment professionals would benefit from regulatory and legal clarity that their investment decisions can be safely undertaken without political interference. By leveraging shareholder rights, robust engagement tactics, and transparent dialogue around lobbying alignment, investors can better inform corporations on strategies that reduce emissions and unlock opportunities for building resilience, competitive advantage, and long-term value generation in a changing world.

As the transition unfolds unevenly across regions and through the dynamics of political cycles, investors can benefit from further regional specificity in their risk assessments. While global initiatives such as Climate Action 100+ provide a platform for engaging companies across different markets—helping investors to understand decarbonisation pathways and regional bottlenecks—there has also been a rise in regional initiatives, such as Climate Engagement Canada, the China Climate Engagement Initiative, and MX Collab. These efforts are becoming increasingly important for supporting localised engagement, targeting companies that are strategically significant at the national level, and leveraging the influence of local actors. Investor engagement has also evolved to recognise systemic barriers that must be addressed for companies to succeed in a transitioning economy. By engaging a broad range of stakeholders around sector-specific challenges, investors can shape policy and real economy conditions that support their long-term objectives.

While corporate engagement is a critical tool for investors seeking to engage companies on climate risks, this type of engagement alone is insufficient to drive decarbonisation and manage systemic risks.[63] This is partly due to the fact that companies—even when willing—operate within an economic and regulatory system that might not support or might potentially even disincentivise such action.

A STRONGER ROLE FOR POLICY ENGAGEMENT

Policy engagement has emerged as one of the most critical levers for investors seeking to manage systemic risks and safeguard the long-term interests of beneficiaries in a changing climate. Many investors have identified the absence of stable, ambitious policy frameworks as a key barrier to the net zero transition. By engaging with policy makers on robust financial and real-economy policies, investors help to reduce the risk of abrupt transitions and market corrections while improving market certainty around the transition and the investment potential in climate solutions.

Policy engagement on adaptation is also now essential due to delays in the economic transition, which have locked in emissions and are increasing physical risks. Robust policy frameworks—from modernised zoning and infrastructure standards to incentives for climate-resilient agriculture—can boost investor confidence and drive investments in climate resilience. By engaging policy makers on adaptation planning, improved risk disclosures, and clear regulatory signals, institutional investors can contribute to promoting sustained, long-term investments in resilient infrastructure and systems.

Box 3: Future climate risks depend on nationally determined contributions (NDCs)

Nationally determined contributions (NDCs) under the Paris Agreement are the principal means through which governments communicate their plans to constrain cumulative greenhouse gas emissions. The future climate trajectory is directly tied to the delivery of these commitments through credible national targets, transition pathways, policy measures, and investment plans. The Paris Agreement includes a five-yearly global stocktake (GST) mechanism designed to assess the collective progress of countries on implementing commitments through emissions reductions.

In 2023, the GST found that if all current NDCs were fully implemented, warming would likely reach 2.1–2.8°C by 2100. In 2024, the UNEP Emissions Gap Report estimated that a failure to increase ambition and deliver on NDCs would put the world on course for a temperature increase of 2.6–3.1°C by the end of the century, with debilitating impacts for people, planet and economies. These assessments underscore the inadequacy of current policy measures to prevent warming exceeding 1.5°C and the need for investors to support an urgent ratchet in policy implementation.

Despite the clear importance of investors' policy engagement in addressing climate-related risks, challenges remain regarding investor capacity in this area. The work of industry initiatives has helped to address these challenges by building investor capacity and strengthening policy engagement activities of individual investors through articulating an increasingly unified investor voice on policy.

In an era of accelerating climate disruption, policy engagement is increasingly positioned as a core component of investor strategy aimed at protecting long-term value. Through this work, investors help to shape the enabling environment for the economic transition towards net zero to not only respond to immediate and direct risks to portfolios but ensure that markets remain investable in the face of instability from climate impacts. In the years ahead, PRI will continue to support meaningful engagement with policy makers and regulators to help signatories to navigate a dynamic and evolving profile of risks. The annex to this briefing includes information on a range of PRI initiatives through which signatories can strengthen their policy engagement efforts and build the necessary capabilities to manage the climate-related risks and opportunities that they face in the critical years ahead.

[63] NZAOA (2022) The Future of Investor Engagement

ANNEX: ADDITIONAL RESOURCES

Further information is provided below on selected resources through which signatories can enhance their capabilities to manage the climate-related risks and opportunities that they might face in the years ahead.

Advisory committees and working groups

Advisory committees and working groups help to guide the PRI's work, many of which support PRI's work on climate change. A Climate Reference Group launched in 2025 aims to build investor awareness, capacity, and interaction by sharing good practice and thought leadership on climate mitigation and resilience strategies. Further information on committees and groups is available here.

Collaborative initiatives

PRI-led and supported initiatives create opportunities to protect and enhance long-term value for clients and beneficiaries, address systemic issues, demonstrate commitment and progress, learn from other responsible investors, and engage with investees, policy makers, and others. Signatories might advance their work on climate risk in a range of PRI-led and PRI-supported initiatives including:

- UN-Convened Net-Zero Asset Owner Alliance
- Net Zero Asset Managers Initiative
- Net Zero Investment Consultants Initiative
- Net Zero Financial Service Providers Alliance
- Initiative Climat International (iCI)
- Climate Engagement Canada (CEC)
- China Climate Engagement Initiative (CCEI)
- Climate Action 100+
- Collaborative Sovereign Engagement on Climate Change
- Spring.

Information on joining and participating in initiative-related activities is available on the PRI website.

Public policy engagement

Public policy critically affects institutional investors' ability to generate sustainable returns and create value. It also affects the sustainability and stability of financial markets, as well as social, environmental, and economic systems. The PRI actively engages with public policy where relevant to promote our principles and mission across major markets and jurisdictions, including through responding to consultations and making recommendations to policy makers grounded in high-quality research. The PRI involves signatories when developing new policy research, analysis, and positions through dedicated reference groups, the collaboration platform, and direct signatory engagement. Further information on how to get involved in policy analysis and positions is available here.

The Inevitable Policy Response (IPR)

The IPR is a transition forecasting consortium commissioned by the PRI that aims to prepare institutional investors for the portfolio risks and opportunities associated with an acceleration of policy responses to climate change. Further information is available here.

Tools and guidance

The PRI produces a range of tools and guidance on how to incorporate climate change into investment decisions and ownership practices in a systematic way, within each asset class. These include introductory and technical guides for investors at all stages of responsible investment. Further information is available here.

Pathways

Pathways is a new, tailored way for signatories to navigate PRI resources to develop their responsible investment practices. Through Pathways, signatories can access the most relevant resources and guidance to advance from foundational steps to leading market practices. Signatories can demonstrate their commitment to responsible investment and gain tailored outputs via Pathway Insight to help them advance in chosen areas. Further information is available here.

PRI Academy

The PRI Academy is at the forefront of training and education in the global investment sector. Since 2014, the Academy has transformed the careers of nearly 30,000 professionals across 90 countries, creating a global community of responsible investment leaders. Further information is available here.