

# Sustainable investing Climate change risk management for insurers

Sustainable Investing Expertise by  
**ROBECO****SAM**

- Climate change poses both challenges and opportunities for insurers
- Regional regulators are providing guidance on risk management
- Stress testing uses temperature scenarios to assess likely risk levels

Climate change is considered to be one of the greatest threats to humanity. Global warming is expected to reach 4.1-4.8°C above pre-industrial levels by 2100 if nothing is done to combat it. The latest report by the Intergovernmental Panel on Climate Change (IPCC) published in August 2021, pulled no punches in saying that the 1.1°C rise in global average temperatures already seen is now “code red for humanity”. This means we’re already more than halfway to the 2°C limit – almost eight decades early – and do not have much leeway in restricting warming to the much more desirable but much more ambitious 1.5°C Paris Agreement target.

Achieving the 2°C target requires the world to cut emissions in half by 2030 and become carbon neutral by 2050. In October 2021, Robeco outlined its Net Zero Roadmap to achieve carbon neutrality across all its assets under management by 2050, having earlier signed the Net Zero Carbon Pledge in 2020. The central aim is to decarbonize investments by an average of 7% per year, which puts Robeco on track to meet the 1.5°C target by the middle of this century.

However, current policies only put the world on track to achieve a 0.5% reduction in emissions by 2030, meaning there is a 100-fold gap between ambition and reality. Such policies will lead to a temperature rise of 2.8°C, according to the UNEP Emission Gap report 2021. More concrete policy pledges for 2030 seen at the COP26 climate summit would bring this down to 2.4-2.7°C, while policy pledges for 2050 (albeit currently vague ones) would lead to a rise of 1.8-2.1°C – more acceptable but still exceeding the Paris targets.

## Article For professional investors November 2021

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## A real urgency for insurers

So, the urgency to deal with global warming is high. And no sector is more exposed to the harsh reality of climate change than insurers. With these challenges, however, there are also great opportunities for the insurance industry to benefit from an inevitable and promising structural change in the investment and underwriting business.<sup>1</sup>

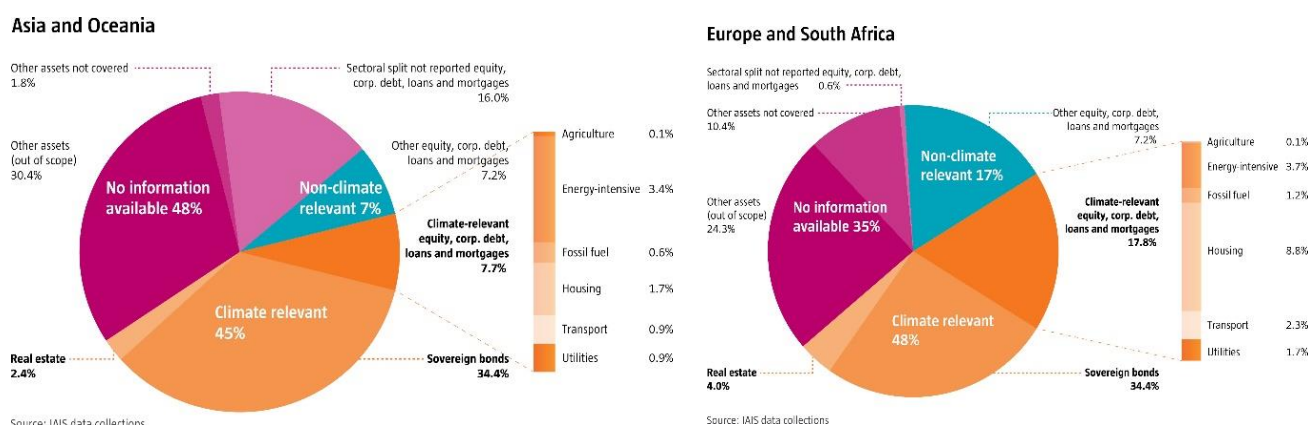
In this article, we examine the role of insurance regulators in providing guidance on implementing climate-related risks. This is particularly relevant in the area of climate risk stress testing, where a range of potential scenarios are considered in order to assess possible financial impact on insurers. A regional overview provides us with the latest developments in climate risk management across Europe and the Asia-Pacific. Finally, we share our thoughts on the impact of climate risk on insurance capital requirements, by showing how Robeco incorporates climate risk stress testing scenarios into its own solvency assessments.

## Insurers have significant exposure to carbon-intensive assets

In its first quantitative global study on the impact of climate change on the insurance sector, the International Association of Insurance Supervisors (IAIS) highlighted the fact that insurers have more than 35% of their investments in 'climate-relevant' assets.<sup>2</sup> Going into more detail, the Global Insurance Market Report (GIMR) 2021 revealed regional differences, with Europe and South Africa having 48% of assets exposed to climate change-related risk, and in Asia-Oceania, 45%.

It means a significant amount of assets are at risk of being devalued as insurers try to meet their decarbonization targets. Many will be left with stranded assets such as investments in fossil fuels that can no longer be extracted and burnt as the world transitions to a low-carbon economy. The GIMR report needs to be viewed in close context with the latest guidance from The Network for Greening the Financial System (NGFS) on the integration of climate-related risks into prudential supervision. The development of incorporating climate change-related risks into financial institutions' stress tests and capital requirement by the supervisory authorities' countries is becoming the norm.

Figure 1 – The split by asset class and climate relevance, at global and regional levels



Source: Global Insurance Market Report 2021, IAIS data collections<sup>3</sup>

<sup>1</sup> [https://unfccc.int/sites/default/files/resource/cma2021\\_02E.pdf](https://unfccc.int/sites/default/files/resource/cma2021_02E.pdf)

<sup>2</sup> Equity, corporate bonds, and loans and mortgages. The choice of climate-relevant sectors is based on climate policy relevant sectors (CPRS), a classification of economic activities to assess transition risk. For sovereigns and real estate, climate risk relevance is derived using geographical location and rankings from the Notre Dame Global Adaptation Initiative (ND-GAIN).

<sup>3</sup> <https://www.iaisweb.org/page/supervisory-material/financial-stability/global-insurance-market-report-gimr>

## Regional regulatory responses












Europe and its unique trans-continental regulator covering 27 EU member states have tended to set the tone for setting up rules that other regions then follow. The UK, which is home to the world's largest insurance industry in the City of London, has also been strong in making sure insurers will be fit for purpose as the world warms. Most developed countries do at least recognize the necessity of having regulation in place, introducing rules which are becoming more stringent every year. The European Insurance and Occupational Pensions Authority (EIOPA) is consulting on several climate change initiatives for insurers, including climate reporting, climate scenario analysis and a review of the capital charges that might accrue from environmentally harmful investments.

The EIOPA's consultation paper that includes its two scenarios outlines an expectation for insurers to integrate climate change risk into their ORSA process in the short and long term. Insurers are being asked to assess both physical and transition risks across their risk assessment processes, including the risks inherent in underwriting, financial markets, credit and counterparties, along with operational, reputational and strategic risks.<sup>4</sup>

The Asia-Pacific region has stepped up efforts to address the issue, as seen in Singapore and New Zealand, and also in Australia. These developments clearly show that the region is making great strides in translating climate change risk assessment into financial risk assessment. Each country has more flexibility to determine the scope of the regulation and the speed of implementation, as there is no regional regulatory authority like the EIOPA. There is, though, a common denominator, as the recommendations of the NGFS have been used to define the broad framework for Asian supervisors.


In the US, President Biden issued an Executive Order requiring all federal government branches to address the Climate-Related Financial Risk in their operations. Further changes are expected in the areas of disclosure and risk management as these progress through the federal system. With all the recent advances, the following table summarizes the most recent developments across regions:

Figure 2 – An overview of regional regulatory responses

	Supervisory body	Guideline	Stage	Note
<b>Europe</b>	European Commission & EIOPA	Opinion on the supervision of the use of climate change risk scenarios in ORSA		<ul style="list-style-type: none"> <li>- EIOPA has issued a consultation paper on how European insurers can integrate climate risk into their internal assessment.</li> <li>- European Commission is recommending for EIOPA to monitor and report on the risk profile for environmental or socially harmful investments.</li> </ul>
<b>UK</b>	Bank of England & PRA & FCA	Enhancing banks' and insurers' approaches to managing the financial risks from climate change		<ul style="list-style-type: none"> <li>- PRA has issued guidance on insurers embedding their approaches to managing climate change financial risks.</li> <li>- Bank of England is extending its Biennial Exploratory Scenario (BES) exercise to look at the financial exposures to physical and transition risks for large insurers.</li> </ul>
<b>US</b>	Federal Insurance Office & State Regulators	In development		<ul style="list-style-type: none"> <li>- Federal Insurance Office is working with NAIC and International Association of Insurance (IAIS) to develop US climate change regulatory framework.</li> <li>- NYDFS has published a report on how transition risks impact on insurer's investment strategies.</li> </ul>
<b>APAC</b>				
<b>Australia</b>	APRA	Prudential Practice Guide – Climate Change Financial Risks		<p>Published in April 2021, with the objectives:</p> <ul style="list-style-type: none"> <li>- To understand potential risks and opportunities from climate change;</li> <li>- To ensure investment, lending, and underwriting decisions are well-informed;</li> <li>- And to implement proportionate governance, risk management, scenario analysis and disclosure practice.</li> </ul>
<b>China</b>	PBOC	–		<p>Central bank's governor highlighted the fact that China is looking into the possibility to include climate change factors in the stress tests of financial institutions.</p>
<b>Hong Kong</b>	HKMA	Climate Risk Management		<ul style="list-style-type: none"> <li>- HKMA drafted the guidelines for authorized institutions in July 2021 i.e. banks;</li> <li>- Guidelines might extend it to other financial institutions.</li> </ul>
<b>Japan</b>	FSA	Basic Guidelines on Climate Transitions Finance		<ul style="list-style-type: none"> <li>- The guidelines were published in May 2021;</li> <li>- The FSA will move forward on potential mandatory climate risk disclosure by March 2022.</li> </ul>
<b>New Zealand</b>	FMC & New Zealand Parliament	Financial Sector (Climate-related Disclosures and Other Matters) Amendment Bill		<p>First country to implement mandatory climate-related disclosures for large insurers starting in 2022.</p>
<b>Singapore</b>	MAS	Guidelines on Environmental Risk Management for Insurer		<p>Published in December 2020 with the objectives:</p> <ul style="list-style-type: none"> <li>- To manage and disclose environmental risks across investments and underwriting;</li> <li>- To build resilience against financial impact and reputational impact.</li> </ul>
<b>South Korea</b>	FSC & FSS	Green Finance		<ul style="list-style-type: none"> <li>- The FSC and FSS applied for NGFS membership in May 2021;</li> <li>- They will introduce guidelines on climate risk management later this year.</li> </ul>
<b>Taiwan</b>	FSC	Green Finance Action Plan 2.0		<p>FSC will observe the development of incorporating climate-related risks into financial institutions' stress test and capital requirement by the supervisory authorities of other countries and the Basel Committee.</p>

 Guidelines are mandatory

 Guidelines for financial institutions in place, not mandatory

 No guidelines in place

Source: Robeco

<sup>4</sup> EIOPA Consultation Paper on draft Opinion on the supervision of the use of climate change risk scenarios in ORSA: [https://www.eiopa.europa.eu/content/consultation-draft-opinion-supervision-of-use-of-climate-change-risk-scenarios-orsa\\_en](https://www.eiopa.europa.eu/content/consultation-draft-opinion-supervision-of-use-of-climate-change-risk-scenarios-orsa_en)

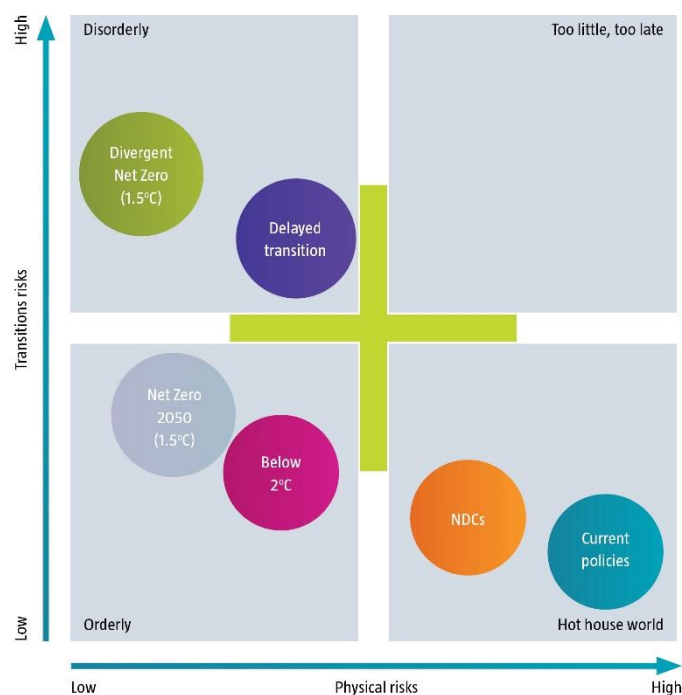
## Climate risk stress tests

Part of the regional response is the use of climate risk stress tests to assess the extent of an insurer's vulnerability to climate change. They have then issued guidelines for each stress test scenario. The main ones are listed below.

### NGFS

The Network for Greening the Financial System (NGFS) is a group of 100 central banks and supervisors and 16 observers committed to sharing best practices for climate and environment-related risk management in the financial sector.<sup>5</sup> The NGFS's climate scenarios have been developed to provide a common starting point primarily for use by central banks and supervisors. It focuses on six main scenarios that outline expectations for an orderly decarbonization pathway, a disorderly one, and the worst possible outcome, a 'hot house world':

Figure 3 – The NGFS scenarios Framework



Source: NGFS

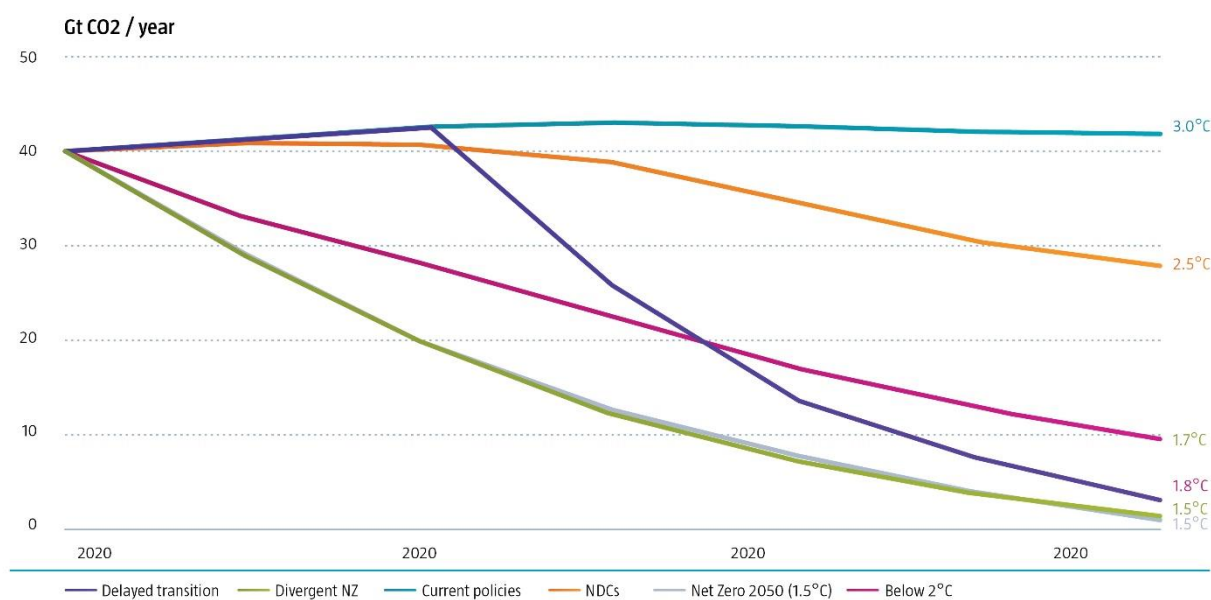
"It is unequivocal that human influence has warmed the atmosphere, ocean and land. Widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere have occurred. [...] From a physical science perspective, limiting human-induced global warming to a specific level requires limiting cumulative CO<sub>2</sub> emissions, reaching at least net zero CO<sub>2</sub> emissions, along with strong reductions in other greenhouse gas emissions." – IPCC<sup>6</sup>

<sup>5</sup> Global Insurance Market Report: The impact of Climate Change on the Financial Stability of the Insurance Sector. Figures for participants correct at 19 November 2021.

<sup>6</sup> Source: SPM-7, IPCC, 2021: Summary for Policymakers. In: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change



Figure 4 – Differences in energy and industrial CO<sub>2</sub> emissions



Source: IIASA NGFS Climate Scenarios Database. \* Emissions estimates for 2020 were based on pre-pandemic trends as this data had not been finalised at the time of the models runs. The pandemic was estimated to reduce emissions by approximately 7%. There is in any case usually a +/- 5% level of uncertainty in estimation.

<b>Orderly</b>	
<b>Net zero 2050 (1.5° C)</b>	Limits global warming to 1.5°C through stringent climate policies and innovation, reaching global net zero CO <sub>2</sub> emissions around 2050. Some jurisdictions such as the US, EU and Japan reach net zero for all greenhouse gases. Gradually increases the stringency of climate policies, giving a 67% chance of limiting global warming to below 2°C.
<b>Below 2°C</b>	
<b>Disorderly</b>	
<b>Divergent Net Zero</b>	Reaches net zero around 2050 but with higher costs due to divergent policies introduced across sectors leading to a quicker phase out of oil use.
<b>Delayed transition</b>	Assumes annual emissions do not decrease until 2030. Strong policies are needed to limit warming to below 2°C. CO <sub>2</sub> removal is limited.
<b>Hot house world</b>	
<b>Nationally Determined Contributions (NDCs)</b>	Includes all pledged policies even if not yet implemented.
<b>Current policies</b>	Assumes that only currently implemented policies are preserved, leading to high physical risks.

## EIOPA

The European Insurance and Occupational Pensions Authority's (EIOPA) has focused on two recommended scenarios to be used in its Own Risk and Solvency Assessment (ORSA). It is also looking at the scenarios developed by the NGFS while encouraging insurers to develop their own.<sup>3</sup>

In the first scenario, the global temperature increase remains below 2°C and preferably no more than 1.5°C, in line with the Paris Agreement. In the second (and currently more likely) scenario, the global temperature increase exceeds 2°C.

## Bank of England: Climate Biennial Exploratory Scenario (CBES)

The Bank of England has recently conducted an exercise where large insurers (and other financial institutions) are required to look at how climate change can affect financial risks. This is being treated as a learning exercise and would help insurers to think through how they may set up their climate risk framework. The key scenarios to be considered are:

**Early action** - The transition to a net zero economy starts in 2021, so carbon taxes and other policies gradually intensify over the scenario horizon. Global CO<sub>2</sub> emissions are reduced to net zero by around 2050. Global warming is limited to 1.8°C by the end of this scenario.

**Late action** - The implementation of policy to drive the transition is delayed until 2031 and is then more sudden and substantial. Global warming is limited to 1.8°C by the end of the scenario. The more compressed nature of the transition results in material short-term macroeconomic disruption, which is particularly concentrated in carbon-intensive sectors.

**No additional action** - This scenario explores physical risks from climate change. Here, no new climate policies are introduced beyond those already implemented. The absence of transition policies leads to a growing concentration of greenhouse gas emissions in the atmosphere and, as a result, global temperature levels continue to increase, reaching 3.3°C.

## COP26 climate conference

In the context of curbing carbon emission and limiting global warming temperature, new scenarios are emerging as more progress is made. In this year's COP26 climate conference a consensus was reached in which we continue to pursue 1.5°C target. This is important as countries set their emission-reduction plans via their Nationally Determined Contributions (NDCs) which under the Paris Agreement were to be submitted every five years. Following talks at COP26, countries have agreed to voluntarily shorten the reporting frequency to every year, which is expected to accelerate the pace of carbon emission reductions.

## Assessing climate risk in portfolios

As a pioneer of sustainable investing, Robeco has long believed that the use of environmental, social and governance (ESG) factors in the investment process leads to better long-term results. Subsequently, Robeco is deeply committed to playing its part in combatting climate change in its top-down and bottom-up level risk assessment.

One challenge, however, is procuring reliable climate data, since different data vendors can provide different information, which in turn can result in significantly different investment decisions. For example, one data vendor may produce information which shows a company is climate friendly based on its interpretation of its data, while another may show that the company is contributing to global warming. In fact, virtually all investments currently contribute to climate change in some way, depending largely on how reliant they are on fossil fuels and how they are transitioning towards becoming 'green' businesses and finding disruptive solutions.

Carbon emissions also present challenges in how they are measured. Scope 1 covers the company's own emissions, while scope 2 emanates from the energy used and scope 3 covers emissions along the entire value chain. Scope 3 includes emissions by the end-user, which are much more difficult to quantify and are prone to double counting. Absolute levels of emissions would also need to be normalized in order to provide a valid comparison between companies of different sizes, and a choice needs to be made on whether this should be done using revenue or enterprise value. And of course, data for current carbon emissions is backwards looking, and does not take into account a company's plans to reduce its future footprint. Additional information would need to be sourced to assess the likely future emissions and its impact on risk.

### Expectations for the next two years

Robeco's Global Climate Survey highlighted that over a quarter of insurers globally have already adopted a net zero emission target, and another 38% plan to do so within the next five years. Clearly a significant amount of work is required by the insurers to build up their internal expertise and re-define their investment strategies and risk management processes to deliver on this target. <sup>7</sup>

This, combined with evolving regulatory requirements, means that insurers are faced with a significant challenge over the next few years. To alleviate some of the burden that insurers are facing, it makes sense to work with an experienced sustainability asset manager with a strong understanding of the insurance industry's needs to help them navigate this journey.

<sup>7</sup> Robeco Global Climate Survey 2021: <https://www.robeco.com/en/insights/2021/03/robeco-publishes-2021-global-climate-survey.html>

At Robeco, while we recognize that climate data is imperfect and needs to improve, we believe that valuable insights can still be gained by applying a pragmatic approach to navigating the data dilemma. For example, we know that carbon data at the sector level is reliable and correctly identifies the most carbon-intensive industries. Against these industry averages, we then look at the individual companies and compare this data against that of its peers. By combining carbon data with other data points such as energy consumption, technology deployment and green revenue, we can build a clearer picture of how each company is affected by climate change.

## Robeco's own scenario analysis and risk models

Given the lack of historical data on climate change, it is often challenging to construct scenario analysis and risk models to assess climate change. To prevent tunnel vision and dependency on data and models, Robeco has taken the approach of applying three types of climate risk scenarios:

### Internally developed scenarios

These are based on both top-down and bottom-up analysis. Initially, all asset classes are assessed based on their industry's sensitivity towards climate risk. A climate risk indicator is then applied to each company to find the winners and losers within each sector for the purpose of investment. One focus is the future treatment of stranded assets, leading to two scenarios:

**Stranded Assets – Orderly Scenario:** The economy is gradually moving to green technology and fossil fuels become redundant. This is a longer-term scenario and in line with the Paris agreement.

**Stranded Assets – Disorderly Scenario:** this reflects abrupt movement of the economy to green technology. This is therefore a short-term and more severe scenario than the orderly scenario.

### Regulatory prescribed scenarios

These are based on guidance from the Dutch Central Bank, which has provided four scenarios that determine shocks on a macro and micro economic level. These are translated into asset and sector-specific shocks with a one-year horizon. The four scenarios are:

1. Confidence shock: Corporations and households postpone investment and consumption due to uncertainty about policy measures and technology. This entails only a shock on equities and has no effect on fixed income portfolios.
2. Policy shock: The carbon price rises globally by USD 100 per ton due to additional policy measures.
3. Technology shock: The share of renewable energy in the energy mix doubles due to a technological breakthrough.
4. Double shock: Combining both of the last two shocks, the carbon price rises globally by USD 100 per ton due to additional policy measures, AND the share of renewable energy in the energy mix doubles due to a technological breakthrough.

### Value at Risk (VaR) scenarios

Robeco also makes use of the MSCI Climate Value-at-Risk (VaR) methodology for a 1.5°C pathway over a 15-year horizon. This allows us to assign probabilities to climate risk scenarios and estimate the impact of extreme climate scenarios not considered in our internal or regulatory prescribed scenarios.

The aggregated Climate VaR consists of three components:

1. Policy impact: The expected impact due to future climate change policies and carbon taxes. This is based on the carbon profile of a company in combination with the tax regimes it is exposed to.
2. Technology impact: The expected upside from future innovation based on a company's patents related to green technology. These are used to estimate the level of 'future green revenue' that each company could attain from the development and sale of low-carbon technologies.
3. Physical impact: The expected loss based on chronic and acute physical risks. Chronic impact manifests itself slowly over time through a reduction in productivity. Acute impact occurs abruptly due to natural catastrophes such as flooding, cyclones and heatwaves. This is based on the geographical location of assets in combination with a weather forecast model.

We supplement the VaR analysis with an implied temperature rise analysis. This metric shows to what extent the portfolio and benchmark contribute to global warming by temperature rise.

### Capital adequacy impact

So far, we have focused on the impact of climate risk on asset revaluation and the potential impact on profit and loss accounts. Climate change risk can also impact an insurer's ability to meet future solvency requirements. We assess this risk by extending our climate risk analysis to check if an insurer has sufficient assets to meet future capital requirements under a stress scenario.

It is important that the horizon of the climate risk scenarios corresponds with the horizon for the required capital calculations. If the climate risk impact exceeds the estimated impact on the standard and/or internal models, then this may be a reason to reassess the financial risks and increase the capital requirement in such a way that a climate risk event does not pose a threat to the profitability or solvency of an institution.

### Conclusion: there's work to be done

With regulators across the globe developing climate-related risk assessment guidelines, insurers are focused on adopting these guidelines in their own risk assessment of their investments and underwriting business. However, this is just one step in a prudent risk assessment in the inclusion of climate-related risk in the investment process.

**This article was created with the contribution of Nico Becx and Rafael Migani Monteiro, Financial Risk Managers at Robeco.**



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