

# Climate Strategy and Modelling

How insurers are blazing a trail to net-zero

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# Foreword

**T**here is a gratifying sense of urgency around insurers' efforts to understand climate risks and develop net-zero strategies. After decades of inaction, work is progressing at a startling rate.

Much of the impetus has come from regulatory enforcement of climate stress testing and disclosure of climate-related financial risk. These activities are furthest ahead in Europe, but the Americas and Asia are on the same pathway and are catching up rapidly.

From these foundations, decarbonisation plans can be built. But at this stage, climate risks are still difficult to model and the thinking around

possible futures relies on expert judgement an awful lot.

Insurers are perhaps in a better position than many other organisations, as they are experts in dealing with uncertainty, building risk models and balancing judgements.

One thing they share, though, is the absence of data to understand the climate risks in their underwriting value chains and assets. This clamour for data is a double-edged sword: demands for clients and investees to disclose their climate data must be matched by insurers' own disclosures, as they too have investors and counterparties that are being asked to perform the same exercise.

The work is undoubtedly a burden for insurers,

but enlightened firms are viewing this as an opportunity, too. The transition to a net-zero economy will require trillions to be invested over the coming years, and new risks will need to be insured. Insurers' know-how on risk management and modelling can also be shared with clients, and society, to improve climate resilience and adaptation.

Most important of all is to maintain the sense of urgency. There is a limited window to take action and, as numerous commentators have said, we will only get one go at reaching the target to keep average global temperatures at 1.5°C above pre-industrial levels.



**Christopher Cundy,**  
Editor,  
*InsuranceERM*

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# Getting on board with climate risk

Climate change might be considered a driver of risk, rather than a new risk type, but it nonetheless requires insurers to undertake major developments in modelling, quantification, disclosures and capital management, as experts discuss in this roundtable

## Participants

**Ben Carr**, Analytics and Capital Modelling Director, Aviva

**Michael Chambers**, Head of ESG Oversight, Phoenix Group

**Deepak Jobanputra**, Chief Sustainability Officer, Vitality

**Brian Kelly**, Senior Actuarial Solutions Manager, Insurance, FIS

**Marina Kodric**, Head of Group ORSA and Regulatory Reporting, Generali

**John Scott**, Head of Sustainability Risk, Zurich

**Martin Sarjeant**, Head of Risk Solutions Management and Strategy, Insurance, FIS

**Chaired by: Christopher Cundy**, Editor, InsuranceERM

Climate strategy and modelling

### **Christopher Cundy: Can insurers help society avoid climate change?**

**John Scott:** We have an influence over the companies we invest in. We underwrite risks, but sometimes those insurable risks are only tangentially related to climate, so the underwriting portfolio is more complex to use as a tool for change. Although there are opportunities to support our customers through the transition with innovative products and services. We can provide risk management insights and advice to help customers manage climate risks. And we can influence policymakers to encourage the transition and adaptation to ongoing physical effects of climate change.

But the extent of this influence depends on what kind of insurer you are, and there are boundaries: a lot of people don't understand

how insurance works and might overestimate how much insurers can influence what their customers or investee companies do.

**Deepak Jobanputra:** Insurers do have a role to play in mitigating climate change. In addition to the choices around how our assets are invested and underwriting options, we can have influence over the supply chain and the value chain. Scope 3 emissions typically represent more than 90% of overall emissions and influencing these will be critical in the medium to long term.

There are also potential opportunities to make positive impacts through product design. Vitality deploys its shared value model to influence members to make healthier and more sustainable choices. Health and climate change have significant overlaps and we recognise the need for a healthier nation.



▲ Clockwise from top left: Martin Sarjeant, FIS; Christopher Cundy, InsuranceERM; Marina Kodric, Generali; Deepak Jobanputra, Vitality; Ben Carr, Aviva; Michael Chambers, Phoenix Group; John Scott, Zurich; Brian Kelly, FIS

**Marina Kodric:** As institutional investors we can embed sustainability and especially influence companies' decarbonisation and broader sustainable strategic goals, and we can make specific infrastructure or green investments.

As insurers, we can similarly to investors, support decarbonisation through screening our underwriting and initiatives like the Net Zero Insurance Alliance (NZIA), but even more important, given our role, we can encourage climate resilience and raise awareness of the need for prevention. Pricing is also a key process with more accurate climate tools being available.

Insurers can also be supportive of public-private schemes that mitigate climate change impacts.

**Ben Carr:** The industry can be quite conservative when faced with new risk and there is no historic loss data. So when it comes to financing new technologies that will be required for the transition, there's definitely a need for insurers to ensure we are not inadvertently penalising them just because they are new.

Climate adaptation is also really important. Even with a 1.5°C scenario there will be significant changes, so we should also be looking for ways to support customers to become more climate resilient.

**Christopher Cundy: What are regulators asking for in terms of climate risk disclosures?**

**Deepak Jobanputra:** It's been reasonably well defined in the UK. The Prudential Regulation Authority's Supervisory Statement 3/19 shows the UK is taking this seriously and in a proportionate manner, recognising the evolving nature of

climate risk disclosure. There is a paucity of data in this space; it's not like other risk areas where we have expert models and rich data sets. But we need to keep progressing. For example, on climate scenario modelling, it has started with qualitative disclosures but there's growing expectation for it to become quantitative.

**“There is a paucity of data in this space; it's not like other risk areas where we have expert models and rich data sets”**

**Deepak Jobanputra**

**Marina Kodric:** The first request from regulators, and the one that is leading our disclosures, is the Own Risk and Solvency Assessment (ORSA). It's a comprehensive risk assessment and supports the business strategy. We introduced climate risk scenarios into our group ORSA already two years ago.

However, we are observing more ESG data collection exercises from regulators where the Generali group operates. Those are to some extent still fragmented at this stage and it is not easy to comply with the different requests while maintaining a consistent approach at the group level for what concerns risk assessment.

**Christopher Cundy: Do you feel comfortable with reporting**

**quantitative information? Is the information useful?**

**Marina Kodric:** At this stage, numbers are useful to get some differentiation in the perspective of risk across various scenarios, and to start to see the impact across timeframes and the orders of magnitude. But with the current state of ESG data, the maturity of the analysis, the unavoidable uncertainties over a long time period, you need to take a prudent approach.

**Ben Carr:** We run a climate value-at-risk analysis on four scenarios, and an aggregate scenario where we probability weight the different scenarios. We currently publish the relative ranges for those scenarios: people can see how they stack up against each other in terms of the impacts, and how those ranges compare, but we don't publish absolute monetary impacts.

We find that relative view useful internally, in terms of setting and validating our strategy, and it's helpful in giving people a sense of which scenarios will have the biggest impacts.

However, there are a number of challenges in publishing absolute monetary amounts. For example, you need to have a view about what's currently priced in, and that's very difficult to assess at the moment.

**John Scott:** There are some really big challenges in modelling something that may or may not happen in 10, 50 or 100 years' time. How do you define the scenarios? Do you model a static or dynamic balance sheet? Over what time horizon? How do you translate the scenarios into financial impacts?

We already report some of the more short-term metrics that relate to physical climate risks

for example AEL and PML – our average annual expected loss and probable maximum loss – which would reflect impacts from changes to today’s climate. For example, storm surge flooding exacerbated by sea level rise as a result of land ice melting.

**Christopher Cundy: Do you hold capital against climate risk?**

**John Scott:** There is clearly a move among regulators to assign capital to long-term climate risks and this has lots of unintended consequences. One consequence could be to potentially make insurance unaffordable for some clients today, based on events that may or may not happen in the future.

It’s fine to assign capital for risks that are a year or two away, which have a degree of certainty associated with them. If you can genuinely foresee some change in the value of your assets or the nature of the risk you underwrite, then of course you want to do the modelling and consider actions like repricing which have implications for capital; that’s what we do all the time to manage the risks in our underwriting portfolios, and reflect in the capital and solvency impacts described in our ORSA reports to our supervisors.

It’s clear climate change is a systemic risk in the long term, but it’s hard to predict the impact of climate on an entire financial system because it’s so dependent on model assumptions. There is some benefit to regulators with prudential responsibilities in exploring long time-horizon stress tests, like the Bank of England CBES, that helps policy makers create strategies to deal with potential systemic risks across the financial system of any one country, or jurisdiction.

**Ben Carr:** We have an internal model and when we are reviewing individual risk calibrations, we have a trigger to think about any climate-related issues. Given the one-year time horizon, it’s unlikely that climate-related issues are going to have an impact on your 1-in-200 view of risk though. Nevertheless, we think it’s important to review that. Given the time horizon, it’s more likely to be transition risks rather than physical risks that are going to have an impact.

However, even for transition risk, given we run hundreds of thousands of scenarios underpinning our internal model, which include a wide range of potential disruptive shocks to the financial system. We don’t think there’s likely to be a gap in terms of overall level of capital.

Where we potentially see a gap is on capital



“There is clearly a move among regulators to assign capital to long-term climate risks and this has lots of unintended consequences”

**John Scott**

allocation. If you want to use capital – and your model – to support your strategy, ultimately it needs to be able to distinguish between a portfolio aligned with the Paris Agreement, and one that isn’t. If your model can’t distinguish between green and brown, it’s not going to help you to allocate capital on that basis.

**Michael Chambers:** In the stress testing exercises like the Bank of England ran last year, at the moment they are excluding capital from the scope. But we definitely see regulators focusing more on that area in the future.

I certainly agree that climate change is a driver that impacts all other risks, rather than a risk you want to look at on its own. To the extent that it has an effect over a one-year time horizon, it would be to affect the levels of your 1-in-200 parameter shocks rather than being an explicit capital charge.

**Christopher Cundy: What are your issues around the availability and quality of data you need to understand climate risk?**

**Marina Kodric:** To make a good climate risk assessment, you need to have a number of pieces of information that might not have been as crucial previously, such as sectoral emissions information. We see issues around fragmentation and availability of data, and not all kinds of investees and clients can be easily mapped in terms of information on geolocation, etc.

We are all working on solving these problems and need to be prepared to see some improvement over time, and potentially fine tunings needed.

**Ben Carr:** One thing that would help is much more widespread publication of transition plans by the real actors in the economy. That will help us to understand the actions they’re taking to decarbonise their books and their business, and to understand the credibility of their plans to become net zero.

We also have a huge challenge on the physical risk side. You can’t assess the risk for real assets without very granular data. You need that globally and for a range of perils, as well as thinking about the indirect impacts from chronic and acute physical effects.

**Deepak Jobanputra:** There is some data on climate’s relationship with health and longevity, but a lot of the studies are US based and these typically have very different climatic conditions.

There’s an opportunity around collaboration, as there’s not a single actor that can solve all these issues, whilst respecting commercial sensitivities. There are some good industry and UN-led working groups working to solve some of these problems.

**Michael Chambers:** Forward-looking data is the biggest gap we face. There’s a big role for us to play as an industry from engaging with the companies we invest in, but also with governments and regulators to encourage disclosure.

**Christopher Cundy: Which reporting standards and frameworks will be important for you in the future?**

**Ben Carr:** The Taskforce on Climate-related Financial Disclosure (TCFD) has been really important. The great thing is it’s a global standard.

We are seeing more mandatory disclosures coming through, and they will become more important in terms of driving future progress. The International Sustainability Standards Board

(ISSB) initiative is going to be key, internationally. It's also interesting to see the development of US Securities and Exchange Commission (SEC) standards around disclosure.

Hopefully we will see alignment with the ISSB, the EU and others. Otherwise there is a risk of fragmentation and lack of consistency and comparability of reporting

**John Scott:** The ISSB is trying to homologate many of the sustainability standards and frameworks out there, such as Global Reporting Initiative (WEF GRI), SASB and TCFD. It's good to see International Financial Reporting Standards standing up in this area, but it's not US GAAP, so the SEC is likely to come up with a different system.

**“Climate change is a driver that impacts all other risks, rather than a risk you want to look at on its own”**

**Michael Chambers**

As a global insurance group, we would love to have a global standard for sustainability disclosures, but in reality I expect we will have to live with some duplication of reporting efforts.

It's complicated to work out what these different frameworks are asking for and map that to the data you generate. There are thousands of data points, and some of them overlap, but have slightly different definitions. My request to regulators is to think carefully, both in the volume and timing of reporting requirements, otherwise the financial services sector will end up submerged under a deluge of reporting requirements, with lots of duplication that will cost a lot to deliver without generating much value.

**Deepak Jobanputra:** If you create a whole industry around climate reporting it could become check-box and compliance led. That misses the point, which is the 'so what': what does the report tell you about the organisation and how can it create influence to make the world a better place? TCFD is a highly regarded global standard with wide acceptance.

**John Scott:** It will get more complex next year when the Taskforce for Nature-related Financial

Disclosures framework is developed. That's a whole range of metrics, which are both similar and linked to, but also different from, the climate change metrics reported in the TCFD framework.

The other challenge is if you disclose it in an annual report, the data will have to be audited: that's a huge task. Some figures are derived and built on assumptions, so auditors will need to understand how they are created.

**Martin Sarjeant:** We've seen a lot of growth in providers of ESG ratings, but currently the ratings can be quite subjective and can vary between providers. That is partly because corporates aren't always disclosing data to the right level, if at all.

Bringing out standards for disclosures, such as those being introduced by ISSB and SEC, will help make data points more consistent and objective. And it will make it easier for insurers to get better quality data, particularly on the companies they invest in or underwrite.

**Christopher Cundy: Which groups are you participating in?**

**Ben Carr:** One we're actively engaged with right now is the Partnership for Carbon Accounting Financials, who are developing insurance-associated emissions standards.

Other than the CRO Forum's carbon footprinting paper, we haven't really had a standard before on underwriting, so hopefully that will motivate people to start reporting the carbon footprint of their underwriting portfolios as well as their investments.

Linked to that is the NZIA: firms will be baselining their carbon footprint and setting targets for their insurance underwriting portfolios.

That will have a big impact over the next 12-24 months. I would encourage people to engage with this initiative because it goes right to the heart of what insurers do and how they can play their part in helping the world to meet the Paris Agreement goal.

**Marina Kodric:** There is also the UN's Principles for Responsible Investment (PRI), Principles for Sustainable Insurance and Global Compact, and the Net-Zero Asset Owners Alliance. They have had a strong influence on the investment side and this is at the core of our sustainability strategy. The NZIA is a game-changer as it provides the same assessment on the liability side.

What's important is these are not just



**“We've seen a lot of growth in providers of ESG ratings, but currently the ratings can be quite subjective and can vary between providers”**

**Martin Sarjeant**

'initiatives' but become embedded in the business.

**Deepak Jobanputra:** Our group takes part in a number of leading standards and frameworks including reporting against the TCFD and signatory to the PRI, CDP, GRI amongst others.

**Christopher Cundy: Will these initiative influence the shape of future regulations?**

**John Scott:** I think it is likely that these recommended frameworks for climate and nature disclosures will end up being part of sustainability legislation or regulation. That's not a bad thing, as financial services companies need that data from the companies who are their clients or who they invest in.

On the topic of influencing behaviour in the real economy to drive decarbonisation and achieve net zero goals, it's obviously helpful for insurers to work together in associations because there's more weight to the voice and this is encouraged by politicians who want the



financial sector to play their part in mitigating greenhouse gas emissions.

But from an antitrust perspective, it's important there is clarity between acting on climate change and managing the risks of climate change. For example, if a small number of insurers created a carbon accounting methodology for underwriting portfolios, that might result in firms declining to do business with certain carbon-intensive clients to achieve portfolio decarbonisation, which might be construed as anti-competitive behaviour. So insurers have to be careful to manage these anti-trust risks by working with reputable and independent third-party organisations, such as PCAF, to develop methodologies and frameworks.

**Christopher Cundy: Do you have a climate risk appetite statement? How did you create it, and how do you use it?**

**Ben Carr:** We have a climate risk appetite statement and a separate climate risk appetite. Climate risk cuts across a whole range of risk types and can hit both sides of the balance sheet. Climate risk is also an amplifier for other risks.

It's important to look at your overall, accumulated climate risk exposure. And if you're going to look at climate through other financial risk types, you need to be able to break it out if you want to be able to manage it, which is a complex task.

We can use the climate risk appetite to manage climate-related risks and track against our strategy and net-zero commitments as well.

**Marina Kodric:** The climate risk appetite also needs to be seen from the 'inside-out' perspective – what impact the Group is having

**“There are a lot of potential futures, and it's a big effort to understand the key variables and identify the most plausible scenario”**

**Marina Kodric**

on the world – and the 'outside-in' perspective, what the impacts on the Group are. Both perspectives shall be taken into consideration when developing a risk appetite.

**Deepak Jobanputra:** We have developed a climate risk appetite statement that forms part of our risk governance framework and is considered as part of the ORSA. This ensures a holistic review and consideration of the impacts as a result of climate related financial risks.

**Christopher Cundy: Does the climate risk appetite tend to cover all aspects of the operation?**

**John Scott:** It depends on the size, scale and scope of an insurer's portfolio, but typically when you create a risk appetite, it's easier for risks that you currently model and have solvency or capital metrics for, such as credit risk or market risk.

For the reasons we discussed earlier, such as the difficulty of modelling over long time horizons, the expressions of climate risk appetites tend to be 'inside-out'. For example, insurers may have thresholds on certain carbon-intensive sectors, ruling out investment

and underwriting for clients that have a certain percentage of their revenue associated with, for example, thermal coal. However, as climate change like many sustainability risks, is often a risk driver for other risks in the ERM framework, then the "outside-in" risks of climate change can also be calculated for the main risks in a company's ERM risk taxonomy, including market and credit risk and built in to the risk appetite expressed for those risks across the enterprise.

**Christopher Cundy: In your climate scenarios and business strategy, how do you reconcile the long time horizon for climate change with the three or five-year business planning cycle?**

**John Scott:** There's a balance in using scenarios in your long-term scenario-based climate risk assessment process to address what you need to take action on now and those risks that may play-out over a really long time, where you can take more strategic decisions.

In scenario-based climate risk analysis most companies take a 'bookend' approach: taking two extremes to stretch management thinking in applying this scenario to your portfolios (underwriting, investments and your own operations). And then maybe a scenario between those two that reflects a particular set of drivers, such as economic impact or political impact.

There are standardised scenarios, for example from the Network for Greening the Financial System (NGFS), that are helpful and well-understood by stakeholders. But they might not deal with your particular portfolio and if you choose to create your own scenarios, you have the additional challenge to explain them to stakeholders. For example people like

your investors, who might use your climate risk disclosures for investment decisions and who might want to compare disclosures between companies and would therefore value comparability, or standardisation of scenarios.

This kind of long-term scenario analysis is entirely different from the short-term scenarios for financial analysis to communicate to a supervisor about changes in capital requirement and solvency. That involves having a base case that you stress, almost like a sensitivity test.

For long-term thinking, where your basic assumptions on scenario outcomes might be wildly out, what you're trying to express is the range of potential outcomes to stretch management thinking and strategic responses.

**Deepak Jobanputra:** We have considered a range of scenarios informed by the Bank of England's Climate Biennial Exploratory Scenario and adapted these to consider the impact of accelerating these to more near-term effects which is prudent and helps inform potential scenarios.

**Marina Kodric:** We stick to the NGFS and Intergovernmental Panel on Climate Change (IPCC) scenarios, but of course it means identifying and understanding correctly the key variables out from the scenario narratives – the ones that have the potential to impact your risk profile – and explaining them clearly.

I say this because there is a lot of information and there is not one perfect forecast; there are a lot of potential futures, and it's a big effort to understand the key variables and identify the most plausible scenario.

We can make reasonable comparative analysis across scenarios and also reply to the typical 'so what?' questions. But we must also understand the interconnectedness with other risks and other social and economic trends as well as the underlying uncertainties.

### **Christopher Cundy: What can insurers gain through long-term scenario analysis?**

**John Scott:** You're trying to stretch management thinking, but unless you're in an industry where you're putting infrastructure in the ground for the next 50 years, like the oil and gas industry where this long-term scenario thinking approach was initially developed, you risk coming up with a big 'so what?' answer.

This is especially so in the insurance sector, where by design, the business model



**“When you define the climate scenario, it's nearly always in terms of high-level climate output. But a company-level model needs more specific economic data”**

### **Brian Kelly**

has significant flexibility to reprice liabilities (insurance contracts) and very liquid assets (investments such as sovereign bonds) to pay claims as they arise. Yes, there are some long-tailed insurance lines of business, which need to be matched by long tenor assets, but looking out 5 to 10, let alone 30 years, there is a lot of flexibility in the balance sheet.

And as the Bank of England stress tests have shown, even with a big impact on the global economy from climate change and a static balance sheet approach, insurance balance sheets are at worst affected by 10-15%.

You have to ask what you're trying to achieve. If it's net-zero emissions, what actions can we take to achieve that? If it's about responding to the 'outside-in' risks, then we have this flexible balance sheet, but we have to think carefully about where risks can't be managed economically through insurance risk transfer. Here I'm talking about public-private arrangements where insurers and governments work together to address risks that have systemic characteristics, such as increasingly

flood-prone areas. It's a societal and political question to decide how to finance the citizens who live in these areas, whether that's by risk pools, like Flood Re in the UK, backed by Government funds, or by general taxation or a levy on insurance premiums.

**Ben Carr:** The key usefulness of these exercises is the conversation that follows: both thinking about how to mitigate potential risk scenarios and what world you ultimately want to end up in – and therefore thinking how you can support the transition to a scenario which is going to be more beneficial for your business as well as your customers and wider society.

**Brian Kelly:** On assumptions, one particular challenge is that when you define the climate scenario, it's nearly always in terms of high-level climate outputs, such as degree of warming or projected carbon prices. But a company-level model actually needs much more specific economic data like equity returns and credit spreads, ideally split by industry sector.

The Bank of England scenarios are already quite good in terms of the data elements and granularity they provide. There is a gross value added for each sector, but it is still challenging to convert such macroeconomic data into financial data for the model. There isn't a standard way of turning it into projected equity returns.

The effect of climate change on mortality is another area of uncertainty. We know that there will be increased heat-related deaths and decreased cold-related deaths, but they will not necessarily cancel each other out, as is frequently assumed. Especially in warmer regions, the impact may be quite large.

### **Christopher Cundy: Do you have the right tools available to help you manage climate risk?**

**Martin Sarjeant:** The regulators and the insurance industry are still in the early stages of tackling climate risk. Insurers can translate the Bank of England (or similar) scenarios and use them within their existing risk solutions, but it is clear that models will become more sophisticated.

The vendor community is also working hard to support the industry with solutions. In the future, I believe that insurers will embed climate risk models into their existing models for ORSA, IFRS 17, LDTI and solvency, rather than keeping them separate. ■





# Climate Change: A New Era in Risk Management and Modelling

Martin Sarjeant, Head of Risk Solutions Management and Strategy, Insurance, FIS  
 Brian Kelly, Senior Actuarial Solutions Manager, Insurance, FIS

**Insurance companies play a vital role in both the business landscape and society. With the world facing the unprecedented challenges of climate change, how can insurers lead the way in managing and mitigating the risks – and encourage others to follow suit?**

## Insurers as investment influencers

There are many areas where insurers can wield their influence to make a positive impact on climate change. One of the most significant is through their investment strategy.

Insurance companies held \$28 trillion in assets at the end of 2019.<sup>1</sup> This represents a significant proportion of all investible assets globally, making insurers a hugely important group of institutional investors. As such, the sector has the power and the responsibility to divert more of its investments into ethical and sustainable assets – and to raise awareness and effect change in the companies it invests in.

In turn, insurers can help reduce their own “transition risk”, which will arise from continuing to invest in businesses that rely on fossil fuels or

are carbon intensive. As we transition to a low-carbon economy, the underlying assets of these businesses (such as oil reserves or fossil fuel power stations) will become “stranded” and lose much or all of their value, with corresponding effects on the value of the stock or bonds of the business.

The speed at which those investment values fall depends on government policy, consumer behaviour and investor sentiment, and whether the companies involved pivot to cleaner or renewable energy. But overall, investing in carbon-intensive companies exposes insurers to very real transition risks.

Consumer preferences have been shifting towards sustainable investments. In the future, this may become the default investment strategy.<sup>2</sup> As

a result, failing to invest sustainably may decrease business for insurers, as consumers move to companies that better align with their values.

Conversely, doing the right thing in this regard may open up new opportunities for insurers to win market share, grow their business and attract and retain talent.

## Encouraging net zero

Insurers can use their position as large institutional investors to influence investee companies in high-carbon industries. The end goal would be for these firms to put in place a robust climate strategy with clearly defined, realistic and measurable targets and a concrete goal for reaching net zero.

This approach will support an insurer’s own net-zero strategy, which should take into consideration the emissions of its value chain and help it meet its obligations under emerging

<sup>1</sup> [https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DCD\(2021\)11&docLanguage=En%22%20%22%20%22\\_blank](https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DCD(2021)11&docLanguage=En%22%20%22%20%22_blank)

<sup>2</sup> <https://www.abi.org.uk/news/blog-articles/2022/03/as-green-finance-takes-centre-stage-is-green-by-default-the-way-forward-for-the-insurance-and-its-industry/>

## “ISSB’s objective is to provide investors with high-quality, transparent, reliable and comparable metrics on climate other ESG components”

disclosure standards.

Another positive action that insurers can take on climate change is to stop or reduce underwriting and associated exposure to carbon-intensive sectors such as oil and gas exploration and extraction.

As with investments, insurers may also try to influence companies they underwrite to reduce their emissions. This strategy may be considered more sustainable in a wider sense, as withdrawing insurance from a carbon-intensive business may have serious effects on the communities that it supports, i.e. the “social” aspect of ESG.

AIA<sup>3</sup> and Legal & General<sup>4</sup> are just two examples of insurers that are actively decarbonising their portfolios. While this will help shift their portfolios to more sustainable investments, it’s also responsible management of the transition risks.

Insurers also can help by reducing the greenhouse gas emissions associated with running their business, committing to their own net-zero targets and reducing their use of water. Additionally, they can start holding their suppliers to the same high standards, as Allianz announced it was doing earlier this year.<sup>5</sup>

### Measuring and reporting climate risk

In 2021, natural catastrophes caused an estimated \$105 billion of insured losses globally.<sup>6</sup> This figure has climbed rapidly and will continue to do so, given the “baked-in” temperature rises from greenhouse gas emissions to date.

For property and casualty/general insurers, this direct consequence of climate change will push up claims, payouts and premiums. But do

insurers really understand how to measure these long-term impacts? We believe not.

Traditional modelling techniques draw heavily on historic data, which climate change will make increasingly less effective as future outcomes diverge more and more from the past. Currently, some insurers may have a much better understanding than others of how this will happen, but it is a relatively new challenge for risk managers – and models are evolving all the time.

In the meantime, climate risk is prompting a raft of regulatory and disclosure requirements.

The International Accounting Standards Boards set up the International Sustainability Standards Board (ISSB)<sup>7</sup> in November 2021 and released two exposure drafts, one covering wider ESG disclosures and the other focused specifically on climate change.

Overall, the ISSB’s objective is to provide investors with high-quality, transparent, reliable and comparable metrics on climate and other ESG components. In the US, the Securities and Exchange Commission is developing similar disclosure requirements.

In the UK<sup>8</sup>, the Prudential Regulatory Authority, Bank of England, Financial Conduct Authority and Climate Financial Risk Forum<sup>9</sup> are all looking at introducing new regulatory frameworks for climate risk management.

And globally, the Task Force for Climate-Related Financial Disclosures and insurance regulatory bodies like the European Insurance and Occupational Pensions Authority and the National Association of Insurance Commissioners are essentially doing the same and finding ways to integrate climate and sustainability risks and reporting into their supervisory frameworks.

All of these regulatory mandates are still very much under development, but four major trends are already emerging:

1. Standards do not prescribe how companies should incorporate climate strategy into their operations, but instead require them to disclose information about governance, strategy and risk management, as well as metrics and targets. The increased disclosures will drive companies to consider, manage and enhance their performance in key areas.

2. The disclosures are designed to clearly link climate-related information to financial performance and help market participants make better investment, credit and underwriting decisions.
3. There is less emphasis on the effect of the company on the environment. Consideration of both the effect of climate on the business and of business on the climate (“double materiality”) would create the clearest incentives for businesses to take a strongly climate-friendly position.
4. The most appropriate quantitative tool for understanding climate risk is scenario testing, which is required under most frameworks if the organisation has the capability to carry it out.

## “The most common approach is to cover both physical and transition risks, based on scenarios proposed by the Network for Greening the Financial System”

### Scenario testing frameworks around the world

Scenario testing frameworks for insurers are already in use in some countries, such as France, Singapore and the UK.

The most common approach is to cover both physical and transition risks, based on scenarios proposed by the Network for Greening the Financial System (NGFS). The Bank of England’s climate stress tests provide a good example.

Under the Bank of England’s framework, insurers must simulate and project the effects on the balance sheet of three scenarios:

- Early Action: transition to a net-zero economy, starting in 2021
- Late Action: delaying the start of the transition until 2031 when it is more sudden and disorderly
- No Additional Action: introducing no new climate policies beyond those already implemented

The balance sheet impact must be assessed at five-year intervals from 2025 to 2050, based on the current balance sheet. Key outputs for

3 <https://fortune.com/2021/12/07/aia-coal-divestment-first-asian-insurer-insurance-fossil-fuels-net-zero/>

4 <https://www.proactiveinvestors.co.uk/companies/news/952315/legal-general-sanctions-130-companies-over-climate-change-foot-dragging-952315.html>

5 <https://www.esgtoday.com/allianz-to-require-net-zero-commitments-from-suppliers-energy-clients/>

6 <https://www.swissre.com/media/press-release/pr-20211214-sigma-full-year-2021-preliminary-natcat-loss-estimates.html>

7 <https://www.ifrs.org/news-and-events/news/2021/12/emmanuel-faber-appointed-to-lead-the-issb/>

8 <https://www.globalcapital.com/article/299h91m7aih1m7-h150g/fig-people-and-markets/uk-edges-towards-new-capital-regime-for-climate-risk>

9 <https://www.bankofengland.co.uk/-/media/boe/files/climate-change/cfrf-call-for-interest-terms-of-reference.pdf?la=en&hash=A67E707498BA63F604D298378A2F0E70D-F44E4EA>

insurers include changes in invested assets and reinsurance recoverables, as well as best estimate liabilities.

Capital requirements are currently out of scope due to their complexity. But given their importance, they are likely to feature in future iterations of the exercise.

### Modelling opportunities and challenges

Industry-level parameters associated with each of the Bank of England scenarios will simulate the economic impacts of carbon pricing on different dates and at different levels. By modelling these effects in your ALM models, you can assess the impact of climate change compared to a counterfactual scenario in which climate change has no effect.

Interestingly, the calibrations imply that economic growth in the first 10 years of the Early Action scenario is only slightly below the counterfactual, and then outstrips the Late Action and No Additional Action scenarios over the remainder of the projection. This challenges the common assumption that good climate policy and economic growth cannot coexist.

### Scenario modelling for climate risk poses implementation and operational challenges in terms of:

**Data** – available scenario information does not often align well with the inputs needed for a standard ALM model:

- High-level details of the scenario, such as projected carbon prices, need to be converted into equity returns for different economic sectors.
- The Bank of England provided projections of Gross Value Added for each economic sector, but there is no standard methodology for converting this into economic data such as equity returns or credit spreads required to value assets in the model.
- For life insurers, the effect of climate risk on mortality and morbidity is not well understood. In many regions, reduced cold-weather deaths will be offset by increased heat-related deaths. However, the overall impact is not necessarily zero, especially in regions which already have hot climates. Analysis is difficult as non-climate trends will also be present in historic data, and recent data is severely distorted by the Covid-19 pandemic.

**Processing power** – insurers will need to run a full ALM model on a number of different scenarios and apply multiple sets of future

economic assumptions to the current balance sheet. So, a large number of ALM runs will be required, each with the potential to be relatively onerous if there are options and guarantees which require stochastic modelling.

A cloud environment can be an efficient and cost-effective solution, as it enables insurers to switch on a large amount processing power for the duration of the production process and then release it when it's no longer needed. Alternatively, proxy modelling may be used to reduce processing requirements, especially if this approach is already in use for other purposes such as capital modelling.

“Capital requirements are currently out of scope due their complexity. But given their importance, they are likely to feature in future iterations of the exercise”

**Model and results management** – the large number of runs will require careful maintenance of input data and assumption sets. Also, results volumes will be large as the scenario exercise will require reporting of asset values at a highly granular level. It is therefore important that the modelling environment allows insurers to lock down all inputs and models, and store results sets in a structured way for future retrieval.

### Interactions and wider contexts

It's also important to consider the interaction of climate modelling with other production models. We envisage that climate scenario exercises will soon require the recalculation of solvency metrics under each scenario. As management of climate risks becomes more embedded in the organisation, it is likely that management will want to understand the effect on other metrics such as those used in IFRS 17 or LDTI.

Any production model will therefore need to be integrated into the climate framework for running under multiple climate scenarios. This requires insurers to base all their models on flexible and reusable components so they can efficiently roll out climate developments across them.

A climate scenario model also provides a ready-made solution to climate risk management for the purposes of an own risk and solvency assessment (ORSA), assuming the company assesses its climate risk as material. The main change required would be to identify suitable scenarios for the ORSA, which should be selected based on the company's own risk profile and hence could be different to any of the standard scenarios.

Regardless of the purpose, it is important to consider the relevance and appropriateness of a set of climate scenarios before applying them. For instance, global economic and political conditions have changed dramatically since the Bank of England scenarios were released.

Today's scenarios would need to consider the effects of the war in Ukraine, policy responses to energy security issues and indeed the possibility of governments putting together a coordinated climate response. The associated economic data would also need to be recalibrated to take into account much higher interest rates and inflation.

For insurers using FIS® Asset Liability Strategy solution, we are adding a comprehensive example climate risk model using the NGFS approach detailed above and Bank of England parameters from the 2021 exercise. Although the example is based on UK climate stress test parameters, incorporation of the NGFS approach provides a strong framework for use in all countries and will help our clients take their first steps toward modelling climate risk.

### Are you ready to manage and model climate risk?

The time is now for insurance companies to start acting on climate risk. By doing nothing at this stage, firms will put their reputations at significant risk and lose valuable opportunities to use their influence as a force for good. Also, understanding and managing the risks and making a positive impact on climate change is clearly the right thing to do for our planet's future.

In the shorter term, there are the new regulations to consider too. Specifically, a range of operational challenges for scenario modelling needs to be considered as well. Again, time is of the essence, and it will pay to start preparing right away. ■

**FIS has the expertise and the tools to help. Get in touch with us at [getinfo@fisglobal.com](mailto:getinfo@fisglobal.com) to find out more.**

# Insurers find a positive challenge in TCFD reporting

Developing climate disclosures and metrics requires a major effort from insurers. It's easy to think it's just more red tape, but firms have found benefits and opportunities, as Joshua Geer reports

Since the formation of the Task Force on Climate-related Financial Disclosures (TCFD) in 2015, it has become a world-recognised framework for reporting climate-related financial information.

Insurers are among the leading adopters, with approximately 40% of larger listed insurers using the TCFD's recommendations on how to disclose climate targets, risks, impacts and opportunities under four main pillars: governance, strategy, risk management and metrics/targets.

Insurers are uniquely well positioned to understand climate risk and the low-carbon transition due to the strong risk management processes already in place. TCFD's 2022 Status Report released in October showed the insurance industry had the highest level of disclosure of any industry on the "risk management" recommendation. But the sector was weaker than almost all its peers on metrics and targets.

For insurers' external stakeholders, these disclosures are becoming more important. TCFD is seen as a solid indicator of climate consciousness for investors, explains Swenja Surminski, climate and sustainability managing director for professional services firm Marsh McLennan.

"More investors expect insurers to show that there is an understanding of climate risk, that there are governance structures in place and that a strategy is being set out," she says.

Insurers have faced a long road and spent significant sums to develop an appropriate response to the TCFD recommendations, but they acknowledge benefits and positive opportunities arising from their work.

## Benefits

Insurers recognise many benefits from TCFD



Swenja Surminski, Marsh McLennan

reporting, notably its encouragement of internal and external collaboration around common climate goals.

Speaking to *InsuranceERM*, Roslyn Stein, head of climate and biodiversity at the French insurer Axa, says compiling information for the disclosures "needed collaboration from both sides of our balance sheet, (insurance and investment), to ensure we shared our ambition and vision when it comes to fighting climate change".

"In this regard, the final climate report enabled us to bring together all aspects of our business, which we and others can assess," says Stein.

Surminski, who consults with insurers when preparing their TCFD disclosures and climate reports, also notes this new sense of collaboration.

"In many instances, it was the first-time

colleagues from different functions came together and spoke about climate matters," she says.

The reporting has also forged collaboration across the insurance industry.

Leah Ramoutar, head of climate and nature risk at UK life insurer Phoenix, explains that reporting allows firms to look across the horizon of climate-conscious insurers and learn from each other.

"In our last climate report, we were transparent and honest with the models and frameworks we used and some of the challenges and limitations we faced. It is hoped that by being open in our approach, it will allow insurers to tackle climate issues together", she says.

## Better insights

Ramoutar notes the process of TCFD compliance for Phoenix was in many ways more valuable than the final climate report publication itself, in terms of understanding the organisation's current position on climate, where it wanted to set its ambition and developing an appropriate strategy.

"With changes and ongoing updates to TCFD guidance and new standards and regulations such as the IFRS's Draft S2 Climate-related Disclosures, the journey to TCFD compliance and embedding is far from over," she adds.

Axa's Stein echoes this sentiment. "The process of using these recommendations is one of continuous review and improvement. Since we started reporting, our methodologies have evolved and matured over the years," she says.

"The good news story of going through the TCFD process is that we are able to identify positive green opportunities and solutions for Axa as both an investor and an insurer."

The TCFD organisation hopes the



Roslyn Stein, Axa

opportunities insurers find through the disclosure exercise will become a natural part of the industry's risk management and strategic planning processes.

Zurich's climate and nature manager, Rob Wyse, highlights that insurers only have one chance to get this right: "The transition to a low carbon economy is a 'once in a lifetime' event – we need to ensure we are well positioned to avail of the opportunities it presents."

### Challenges

Despite insurers' proficiency in understanding risk, Phoenix's Ramoutar says adapting to TCFD reporting requires a lot of education across the entire group.

"Support from all areas of Phoenix is necessary to achieve our climate goals. Therefore, we had to do a lot of educating and engaging, from those at board level to executive management and right down to functional level. We focused a lot of effort to make sure we got this right."

Zurich's Wyse adds this large-scale collaboration can be intensive.

"As many large corporates would attest, implementing the recommendations of TCFD can be challenging given how their cross-cutting nature demands co-ordinated action across all areas of the business which is resource and time intense," he says.

Insurers have also had to create methodologies, build up capabilities and understand the most pertinent risks in order to fulfil TCFD requirements, says Axa's Stein.

In this regard, one of the most challenging areas was establishing the metrics and modelling capabilities.

According to Marsh's Surminski: "Insurance departments that assess physical risk, underwrite and run climate models are often brought in to

provide models and data for TCFD. However, the questions they need to answer are frequently beyond what their normal scope is."

Both Axa and Phoenix say it was necessary to make use of third-party providers to support scenario and stress testing model development and to procure climate data.

Ramoutar notes when Phoenix first embarked on TCFD climate reporting, from a metrics perspective, development was limited by both the lack of and quality of climate-related data.

There were also a lot of fundamental questions to be answered, says Ramoutar: "How do we build-in climate risk and opportunity within our governance? How do we integrate climate within the risk management framework? What is our strategy and what changes are required to our business model to deliver net-zero plans? What methodologies do we use and what metrics and targets will we measure and monitor?"

Surminski says this can be particularly daunting for insurers just starting on their TCFD journey. "Especially the first time around, it is really intensive work, and insurers are having to ask themselves questions they have never asked before."

Despite the struggles, both insurers recognised the positives of these challenges.

From Axa's perspective, Stein says: "TCFD has helped us develop clear climate methodologies, and the modelling involved has been particularly useful as a productive means to engage with regulators and other market players on climate-related matters."

Zurich's Wyse highlights that TCFD encourages "insurers to understand how climate change risk may impact our risk positions over time" and therefore identify what actions can be taken in the near term to address possible impacts.

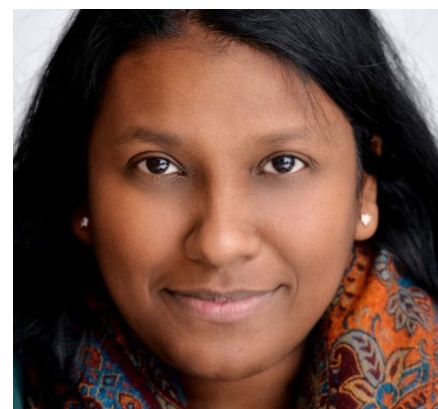
### Lessons learned

One important lesson from the TCFD experience is to just start moving forwards.

Aviva, one of the initial 29 TCFD members, stresses in its climate report that organisations cannot wait until the data and methodologies are perfect to begin their disclosure journey.

"At this stage in climate reporting, data and methodologies for producing climate-related metrics over extended time horizons are still relatively immature compared to traditional financial metrics," says Aviva.

But it is the process itself that allows insurers to identify the risk metrics and opportunities, says Phoenix's Ramoutar. "You can't wait to have all the answers before getting started; but doing



Leah Ramoutar, Phoenix

foundational work is very important."

Considering the immaturity of climate metrics, Zurich's Wyse adds that metrics and models are no magic bullet.

"Do not take the number that comes out of the model as the answer – use that as a basis to engage with your subject matter experts and capture the nuances around what that number may suggest in order to arrive at a truer understanding of impacts," he says.

One aspect of TCFD reporting is an honest assessment of where progress still needs to be made.

Axa says it is keen to leverage its TCFD reporting to better understand the extent of its climate impact in relation to the coverage insurers provide.

Axa's Stein says one issue is there is no clear approach for how insurers should account for the carbon emissions of the companies and individuals they insure. However, an initial methodology is being worked on by members of the Net-Zero Insurance Alliance and the Partnership for Carbon Accounting Financials and will be published this year.

Another initiative on the horizon is the Taskforce on Nature-related Financial Disclosures, which seeks to do for nature and biodiversity risks what the TCFD does for climate change.

More work on more disclosures can easily feel like more red tape, but Marsh's Surminski says it is important that insurers do not feel as if climate awareness is simply a constant chain of reporting requirements. "Insurers should want to get something out of it. If approached in this way, it becomes a worthwhile investment as risk can be internalised, understood and used to make strategic decisions to address the impending climate challenges." ■

# Climate change raises more questions for catastrophe modelling

**Insurers' long experience with modelling weather-related catastrophes should put them in pole position to understand how climate change will affect physical risks. But adapting current cat modelling approaches to gauge climate risk is not straightforward, so new techniques are being developed. Christopher Cundy reports**

**T**hirty years ago, hurricane Andrew swept across the Caribbean, Florida and Louisiana, leaving devastation and death in its wake. The vast damage claims pushed almost a dozen insurers into bankruptcy, but the event is widely acknowledged for one positive development: the widespread adoption of catastrophe risk modelling in the insurance sector.

Since then, insurers have become increasingly adept at understanding their potential exposures to tropical storms, floods and earthquakes, and adapting their underwriting and capital strategies in response.

But climate change is posing a fresh challenge to cat modellers. Not only do they need to think about how the atmospheric perils might be affected today, but also into the future. The tools they have at their disposal might not be up to the job.

## Climate models are different from cat models

Scientists have developed global circulation models (GCMs) to study how variations in parameters such as sea surface temperature affect the behaviour of the atmosphere and oceans. They are used to generate predictions about the effects of global warming, such as rising sea levels.

But incorporating GCMs into cat models to understand, for example, how an insurer's hurricane exposure is changing, is not straightforward.

Robin Lang, senior vice president and head of risk oversight at Renaissance Re, says the approach depends on whether the insurer is



**Maryam Haji, TransRe**

looking for a short-term or long-term view.

"With the short-term view, you are genuinely trying to quantify risk. You're trying to quantify and interpret the output with the best available data and science: where you have conviction that climate change is evident in data now, or you've got research and climate models indicating that this is likely to happen in the near term.

"You can start taking that information, working it into your model, making adjustments, and you can begin to draw inferences from that with some level of comfort that you're getting close to an answer."

But for a longer-term perspective, Lang queries what the objective really is. "Do you expect to get the number back from your modelling team that your 100-year PML

[probable maximum loss] is up 'x' percent? That's probably an inappropriate use of the model when you consider the layer upon layer of assumptions that you made to get there."

Lang suggests cat models can still be useful for long-term qualitative exercises: picking a view and seeing how that impacts the regions and perils, then thinking how that impacts the current portfolio and strategy.

## Parameter uncertainty

Maryam Haji, vice president and head of catastrophe research at TransRe, says GCMs are normally designed to look at mid-century to end-of-the-century impacts of rising carbon emissions and temperature rises.

In contrast, cat models "are designed to provide a view of risk for a peril and a region using more localised weather patterns. So their use is completely different."

She gives the example of a hurricane model, where a cat model will need to incorporate changes in frequency, instability and attributes such as central pressure, maximum radius and wind, as well as track.

"All those are a translation of the science, from the climate models to the cat models, and every single parameter adds a layer of uncertainty to the analysis."

An additional source of uncertainty is the transition risk. For example, how are building codes going to change over the next 30 years and how will that impact physical risk?

"Looking at the longer-term perspective for the physical risk, it might not give us the correct signal for the direction of the risk change," she says.

And while most are aware of climate change will raise average losses, it could also impact

the volatility. For instance, in the UK, climate projections suggest the frequency of summer flooding will be reduced, but at the same time there will be an increase in the most extreme floods.

### How much already?

Erdem Karaca, senior vice president and head of cat perils for the Americas at Swiss Re, says the question he faces more often is how much climate change is already here. For instance, given persistently high wildfire losses in recent years, has this become the new normal? Or is this natural variability? And how much of it is due to climate change?

“We can rely on climate models to put the last couple of years and decades, or the next couple of years and decades, into perspective. But there’s more work to be done, and I want to highlight that capturing that baseline is very important.”

RenRe’s Lang says he believes with the right definition of a cat model, it’s possible to reflect current-day climate risk in cat models.

But he adds: “I’m not suggesting that everyone is doing it. There are bandwidth issues within the development of cat models that are going to hold us back and that we, as an industry, will need to overcome.”

### Building conviction

With so many signals coming from climate science, cat modellers must find a way to prioritise the research and devise parameters to input into their models, Lang advises.

“Once you do implement them into a cat model, the outcomes are not necessarily a distribution with a mean and zero: they will tend to show a signal one way or the other. This is how you start building conviction. Our ability to ensure the models remain robust and can reflect these signals relies on prioritising regions and perils where you can build that conviction.”

But as Haji reminds us: “It is difficult to isolate the impact of climate change from the natural variability of weather systems. These confidence barriers increase the uncertainty in quantify the



**Robin Lang, RenRe**

climate change effects on high-severity perils like hurricanes.”

### Technology gap

Melinda Strudwick, risk and capital lead partner at PwC, says her clients are finding that vendor models are not really capturing the shorter-term changes in the climate.

“Some general insurers convinced themselves climate was a longer-term issue and they could manage exposures in the short term and re-price every year, but they are getting caught out by the speed of change,” she adds.

Dom del Re, PwC’s director for sustainability and climate change, adds the technology is missing to downscale GCMs, to see how smaller, more local events are affected in terms of frequency and severity.

“GCMs weren’t built for that. They are mostly built to look at climate, rather than the weather,” he says.

“Today, there’s a lot of research to see if the frequency and severity of, for example, severe wind or rainstorms – which will lead to urban flash flooding and flooding in river basins – is that different to the last 50 years. It’s massively

computationally intensive to do that, and even with all the supercomputers we have today it’s still a challenge.”

TransRe’s Haji suggests there are opportunities to use machine learning (ML) and artificial intelligence to incorporate more data, to better understand hazard frequency and severity patterns and trends.

A new breed of cat modellers, such as Australia’s Reask, are using ML techniques to make the climate modelling approach useable by insurers.

For any model, present or future, Haji urges they have the capability to be adjusted to company’s own view of risk, and are transparent in terms of assumptions.

### Societal role

Developing cat models to better incorporate climate change is necessary for insurers to manage risk, Haji notes.

But there is an additional risk management responsibility – and a very important one – that the sector has in wider society.

PwC’s del Re explains: “Insurers will have a role in helping governments and other financial institutions make decisions on what we are extrapolating from the GCMs, and converting that into the potential for loss and damage. Insurers can therefore help create the business case for investment in adaptation to climate change.”

He says organisations such as the Insurance Development Forum are helping bridge the gap between private sector insurers and public institutions, to build greater resilience to disasters that will likely become more severe as the climate warms. However, he stresses more could be done.

Strudwick adds the sector has the necessary skillsets desired by society.

“Insurers have the discipline to think about extreme events and how you blend expert judgement with history and trends. It’s what we do for a living. We should be well set up to handle and assess complex emerging risks,” she says. ■

