

**WHITEPAPER**

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## Climate scenario analysis for the life insurance sector

To make informed decisions, build resilience and address regulations, life insurers need modeling and scenario analysis to understand the impacts of climate change on their business. In recent years, there has been growing pressure to become climate aware in the Own Risk and Solvency Assessment (ORSA) and Strategic Asset Allocation (SAA) processes. We have seen the increased focus from national and international bodies and groups on climate change. The Net Zero Insurance Alliance (NZIA), Task Force on Climate-Related Financial Disclosures (TCFD), and International Sustainability Standards Board (ISSB) are among some of those, calling for detailed scenario analysis in relation to climate disclosures. In April 2021, the European Insurance and Occupational Pensions Authority (EIOPA) stated that “the materialization of transition risk has the potential of disrupting the sectoral composition of the economy, for example from carbon-intensive to green sectors. This may put carbon orientated investment strategies under pressure with assets becoming stranded”. The following year, in May 2022 the Bank of England stated that “banks and insurers will need to prioritize investment in their climate risk assessment capabilities, both by focusing on their internal modeling and data capabilities and doing more to scrutinize data and projections supplied by third parties”. They went on to say that in certain scenarios “banks would reduce lending to properties facing greater physical risks and insurers would substantially increase the premiums they charge to insure against such risks, making insurance coverage unaffordable for many of these households”.

We are now seeing institutions looking to move on from being climate aware to becoming truly climate resilient. At Moody's Analytics, we hear this from our clients, and we can also see this trend in a recent study we conducted which found that the key drivers for climate scenario analysis were disclosure (TCFD requirements) and regulation. We also see the importance of quantitative modeling coming to the forefront along with the need to address transitional risk and physical risk.

## Scenario analysis at the heart of risk modeling

Scenario analysis has long been at the heart of modeling for life insurers with both deterministic and stochastic scenarios used. This remains the case whether an institution has a shorter term awareness goal or longer term resilience goal: the first step is to understand the impact on the business. However, climate change scenarios also need to be linked to a policy narrative, for example BAU—which assumes temperatures rise at the current predicted rate—or Net Zero. Life insurers need to understand the implications of the effects of climate change itself. The physical risks, and the implications of policy changes designed to address or prevent climate change - the transition risks.

It can seem that institutions are expected to become experts in climate science, environmental economics, macroeconomics, technology change, and socio-economic uncertainty. This can be daunting but there are approaches that help break down the problem. An insurer can start with socio-economic assumptions to define a pathway, then use the appropriate model depending on whether physical or transition risks are being considered. Finally, they can layer in impact analysis to show how the economy, ecosystems, or financial markets might be affected. Using quantitative scenarios here helps bring clarity and ensures that the modeling is open to scrutiny. It also helps life insurers address climate risks within their existing business practices.

The very nature of the topic means that there is a high level of uncertainty covering climate change effects to technology advancements. There is also model risk to contend with. However, after they are articulated, the economic, and financial aspects are ideal for scenario analysis.

## The importance of sources

As important as the models themselves, are the sources used and there are several options available. At Moody's Analytics, we create scenarios using our Scenario Generator to model paths for market risks and asset returns. These paths embed the effects attributed to stated climate narratives. Our customers can then understand the impact of climate change on their business without having to do the mapping from variables with a less intuitive connection to the financial sector. The narrative assumptions can be taken from various global bodies. The Network for Greening the Financial System (NGFS) narratives include Net Zero 2050, Current Policies, Below 2C and Divergent Net Zero. These are popular with financial institutions and were the basis of the Bank of England's recent Climate Biennial Exploratory Scenario (CBES) exercise. The Intergovernmental Panel on Climate Change (IPCC) provides governments with information that they can use to develop climate policies and includes narratives such as AR5 and AR6. The UN Inevitable Policy Response group (IPR) is designed to help financial institutions navigate transition and model the effects of policies on the real economy out to 2050 such as the Forecast Policy Scenario (FPR).

Life insurers need to ensure that they understand the scenarios available and decide which are most appropriate for their objectives, that is, stress testing or asset allocation. They also need to choose scenarios that reflect physical risks or transition risks in line with their objectives. Physical risks are direct effects from rising temperatures. They can be acute and potentially transient and diversifiable or chronic and systemic. In either case, they do not consider any behavior or policy response. In contrast, transition risks are permanent shifts driven by policy.

In reality, the interaction between the two is complex and intertwined. For life insurers, understanding the impact of the introduction of carbon prices is key. A transition scenario will include tax on CO<sub>2</sub> emissions. This is a significant cost early in the scenario but it will drive technological change. So, in the short term, energy prices increase, which leads to inflation, but in the medium term, the technology advancements should reduce energy costs and thus inflation. Further to this, life insurers need to be able to quantify the impact of transition risk on different sectors. It seems intuitive that sectors dependent on fossil fuels will be hard hit in scenarios modeling a steep increase in carbon tax but it is likely that different sectors will be affected at different speeds. Scenario analysis can help model choices around the evolution of the energy mix.

## Keeping up to date as technology and the environment evolve

It is also vital that life insurers keep up to date as the guidance evolves to ensure that they can embed current climate risk into their scenarios. In May 2020, NGFS released its first set of climate scenarios. These were open source and available on the International Institute for Applied Systems Analysis (IIASA) website. Since then, Phase 2 and Phase 3 updates have been published, which have been used for regulatory exercises like central bank stress tests. The NGFS scenarios differed from previous initiatives as they incorporated physical and transition risks into one data set. They are not without their limitations. But at Moody's Analytics, we believe they are a good starting point, and help life insurers take the first steps to becoming climate aware. The most recent Phase 3 release uses the same narratives and models but some of the assumptions have changed to reflect the changing environment.

The Phase 3 scenarios cover a good range of possible policy risks, for example, whether transition aims at 1.5C or 2C, whether it happens now or is delayed. They also look across Integrated Assessment Models' different technology assumptions and different sensitivities for chronic physical risk. A key advantage is to be able to use a single scenario across different models. But we must remember that different Integrated Assessment Models have different assumptions about factors such as capital cost or land usage. Different technology assumptions can be significant when looking at optimal energy mixes or carbon taxes. Ideally, we could consider different paths, for example, high level of carbon capture versus none.

## Continuing challenges for life insurers

Sector modeling remains a challenge. There is still scope for significant differences, and nuance and interpretation is important. It can be a complex process to assess the impact on the balance sheet fully, as it involves aligning all of the assumptions between macro and sector modeling. Underlying common input is needed to isolate impacts but can have significant effects, for example when linking a lower emissions path to lower growth or vice versa.

There are criticisms to this approach, including around the level of economic damage in the scenarios or even the basis of using neo-classical economic assumptions in the first place. There are sections of the sustainability community that believe system change or even degrowth should be considered. Overall, the emerging consensus across the models is that it is cheaper to act now than do nothing in the long run; but that might be some way off. Ultimately there is a political and controversial question around who pays and how.

## Building a sustainable, resilient business for the future

Many questions remain. What is clear, is that climate scenarios are central to climate change modeling for life insurers, which in turn is vital for stress testing such as the ORSA or external reporting such as TCFD. This is only going to grow in importance as life insurers adapt their strategies and seek to build a sustainable, resilient business for the future. They do however, have tools and resources at their disposal to incorporate quantitative scenario analysis—with up-to-date information—into their businesses, to support them on this journey.

For more insights on this topic, scan below to listen to our podcast series: **Forward-looking climate scenario analysis for the life insurance sector.**



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