

Climate scenario analysis: emerging supervisory practices – executive summary

Climate scenario analysis is a risk assessment tool that provides a “what if” methodological framework to explore how climate-related financial risks might materialise in possible future states. Unlike traditional risk models that rely on historical data, scenario analysis is useful in assessing climate-related financial risks due to significant uncertainties related to climate change.

In the financial sector, climate scenario analysis is an important tool that both supervisors and financial institutions use to assess climate-related financial risks. This Executive Summary provides an overview of the Network for Greening the Financial System (NGFS) climate scenarios¹ and draws upon the 2022 report *Climate scenario analysis by jurisdictions: initial findings and lessons* published jointly by the NGFS and the Financial Stability Board (FSB).

Objectives of climate scenario analysis

In practice, supervisors use climate scenario analysis for a range of purposes, including to assess:

- how climate-related risks can impact financial stability (a macroprudential view)
- how climate-related risks can impact individual financial institutions (a microprudential view)
- what environmental factors and risks can impact insurers, as set out under the International Association of Insurance Supervisors Insurance Core Principles

Climate scenario analysis serves more than one objective for most of the surveyed jurisdictions. The most common use of such analysis is to assess how climate-related risks could impact individual financial institutions on a microprudential level and financial stability on a macroprudential level. The least common is to use the exercise to formulate climate-related government policies.

Financial institutions use climate scenario analysis to assess their climate-related risk exposures and to fulfil disclosure requirements, for example those related to International Financial Reporting Standards (IFRS).

Conducting a climate scenario analysis

Supervisors typically use one of three different approaches when conducting a climate scenario analysis: a top-down approach², a bottom-up approach³ and a hybrid approach. The most common approach is top down.

Both supervisors and financial institutions could use the following stylised example, involving four key steps, when conducting a climate scenario analysis:

¹ Relevant NGFS publications on climate scenarios can be found on the [NGFS website](#).

² A top-down approach is where the financial authority runs the analysis in-house, allowing the authority to cover a large sample of financial institutions.

³ A bottom-up approach is based on financial institutions submitting their own impact assessment of each scenario. The benefit of this approach is that it generates important data on firm-level exposure.



Step 1: Identify the objectives of the exercise and select the time horizon.



Step 2: Select the relevant climate scenarios. The NGFS scenarios provide a common starting point for supervisors or financial institutions to analyse climate-related risks to the economy and financial system. They can modify these scenarios to make them more relevant to a jurisdiction or a firm. They can also use non-NGFS scenarios. Using a selection of different scenarios can provide a more comprehensive view of potential outcomes.



Step 3: Assess the impact of climate risks on economic and financial variables. Supervisors use a range of methods to model these impacts, working to combine the models and improve the macroeconomic modelling to calibrate them more accurately.



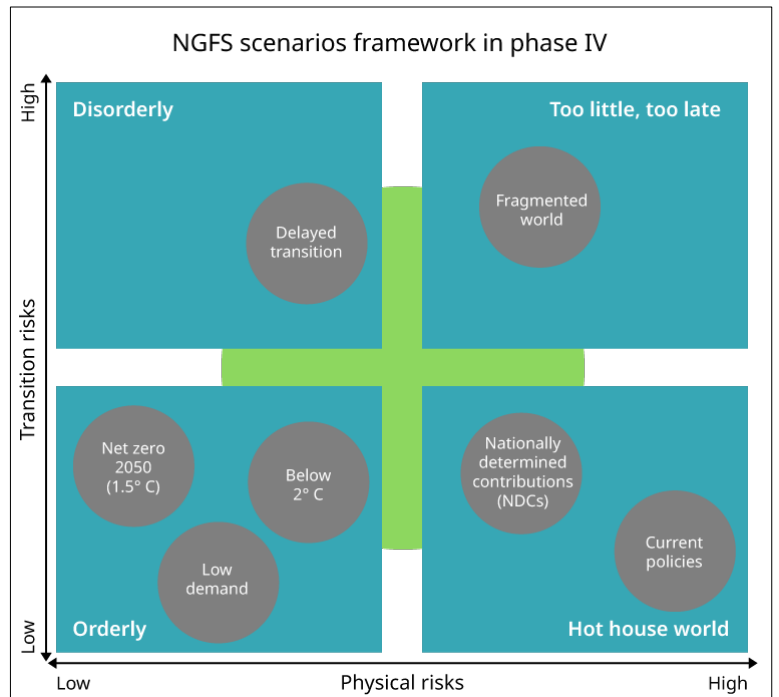
Step 4: Communicate the results along with the key assumptions underpinning them. This should provide a basis for follow-up actions to improve risk management practices within financial institutions.

The NGFS scenarios

The NGFS scenarios were developed primarily for risk assessment purposes, focusing on impacts on the economy and the financial sector over long time horizons.

Currently seven⁴ NGFS scenarios provide a range of plausible outcomes for how climate change, climate policy and technological trends could impact the economy and financial system. The most commonly used scenarios are current policies, net zero 2050 and delayed transition. These scenarios explore the risks that would arise from hot house world⁵, orderly⁶ and disorderly transitions.⁷

The NGFS will publish new shorter-term scenarios with three- to five-year horizons. Short-term scenarios can overcome limitations in macroeconomic and financial risk analysis, specifically long-term climate-economy relationships as captured in current NGFS climate scenarios.



⁴ The NGFS updates the scenario framework periodically. Seven scenarios are in the current (phase IV) framework, compared with the six scenarios featured in the joint NGFS-FSB report published in November 2022. The NGFS scenario framework in 2022 included the divergent net zero scenario (which was removed in phase IV) and did not feature two of the current scenarios – low demand and fragmented world.

⁵ Hot house world scenarios assume that some climate policies are implemented in some jurisdictions, but global efforts are insufficient to halt significant global warming.

⁶ Orderly scenarios assume climate policies are introduced early and become gradually more stringent.

⁷ Disorderly scenarios explore higher transition risk due to policies being delayed or divergent across countries and sectors.

Results of climate scenario analyses

In most of the surveyed jurisdictions, the disorderly transition scenario had the most severe impacts in terms of lowering gross domestic product and increasing financial losses. In both disorderly and orderly transition scenarios, the largest impacts were on carbon-intensive sectors, including oil, gas and coal extraction.

In high physical risk scenarios, where more severe and frequent natural disasters occur, there could be a significant impact on most local sectors, including agriculture, mining and construction. For example, severe flooding concentrated in a specific geographical area or densely populated areas can heighten the impact on local sectors.

Challenges

The main challenge in conducting climate scenario analysis concerns data availability, consistency and comparability. For example, data on greenhouse gas emissions of a bank's counterparty may not be available or may lack granularity. This can limit financial institutions' understanding of their counterparties' exposure to transition risks. Authorities use in-house modelling, expert judgment and third-party data sources to address the data gaps. The recently published IFRS General Requirements for Disclosure of Sustainability-related Financial Information (IFRS S1) and Climate-related Disclosures (IFRS S2) should also help to address data gaps. These standards require financial institutions to disclose sustainability and climate-related information.

To improve climate scenario analysis exercises, it is crucial that financial institutions and supervisors cooperate across borders to share good practices between jurisdictions. Global collaboration will aid progress towards a common framework that balances standardisation and comparability with local specificities.

This Executive Summary and related tutorials are also available in [FSI Connect](#), the online learning tool of the Bank for International Settlements.