

NGFS Short-Term Scenarios: Sharper Modelling, Some Old Narratives

The NGFS's set of short-term climate risk scenarios advances its earlier analysis by quantifying impacts, benefiting further from modeling that allows for more complex interactions, including those within the financial system. However, it continues to rely on scenarios defined two years ago, failing to reflect recent developments such as the diminishing plausibility of a net-zero pathway or the decoupling of U.S. climate policy.

NGFS Short Term Scenarios: What are they? How are they intended to be used? The NGFS Short Term Scenarios¹ are a set of alternative climate futures, with a focus in the next 5 years, quantified through state of the art analytical tools (models) to help central banks, supervisors, and other financial institutions better understand and manage immediate climate-related risks.². It's worth noting that these scenarios are not predictions of the exact future but plausible pathways that depict potential impacts of climate change and the corresponding policy responses within a near-term horizon of about five years. Specifically, the NGFS short-term scenarios include four distinct narratives (Box 1. Short-term scenario narratives). There is also a baseline scenario incorporating climate targets committed by January 2023 (e.g. GHG reduction targets or carbon price targets, share of renewable electricity in a country's energy mix) and calibrated using the October 2023 IMF World Economic Outlook macroeconomic variables.

¹ Reference: <u>NGFS Short-term Climate Scenarios for central banks and supervisors | Network for Greening the Financial System</u>.

² Among them: i. Financial stability analysis and stress testing; ii. Monetary policy calibration; iii. Risk management and planning.



Box 1. Short-term scenario narratives

From 2050 to the Next Five Years. On May 7, 2025, the Network for Greening the Financial System (NGFS) published its first short-term climate scenarios, shifting the climate challenge from a distant 2050 horizon to the five-year window. For years, regulators and financial institutions have called for tools that translate climate dynamics into immediately usable financial variables; sectoral default probabilities, inflation under energy constraints, sovereign risk premium volatility. While NGFS long-term pathways offered useful strategic visions, they lacked the granularity needed for near-term decisions on asset allocation and insurance coverage. The four new scenarios address this gap, incorporating transition policies, acute physical shocks, and macro-financial interactions projected through 2030.

- 1. **Highway to Paris:** Represents an orderly, technology-driven transition where ambitious climate policies are implemented gradually and coordinated globally. Carbon taxes are increased progressively, and 80% of revenues are fully recycled into green technologies R&D, resulting in moderate economic impacts. This scenario limits global GDP losses to around 0.4% compared to a baseline scenario by 2030, has contained inflation, and a decreasing weighted average cost of capital in low-carbon sectors.
- 2. Sudden Wake-Up Call: Captures the risks of a delayed and abrupt transition. In this scenario, policymakers act suddenly in 2027, triggering steep and uncoordinated carbon prices. This leads to significant immediate shocks to the economy, causing global GDP to drop by approximately 1.3% compared to the baseline by 2030, with unemployment increasing significantly due to the rapid transition. The scenario describes inertia followed by panic: three years of inaction, then a brutal regulatory shift in 2027 causes the global price of CO₂ per ton to soar.
- 3. **Diverging Realities:** Combines transition risks and physical risks, reflecting a world where climate policies differ greatly between advanced economies (which pursue aggressive green transitions) and emerging markets and developing economies (EMDEs), which suffer repeated severe climate-related events and supply-chain disruptions. This scenario highlights significant macroeconomic impacts, including elevated costs of transition in advanced economies due to shortages of critical raw materials and severe economic disruptions in EMDEs.³
- 4. **Disasters and Policy Stagnation:** This scenario models severe physical risks through extreme but plausible (return period of 1 in every 50 years) regional weather events, such as droughts, heatwaves, wildfires (in 2026), and floods and storms (in 2027). These events lead to substantial regional GDP losses and wider global impacts through trade and financial networks. Regional GDP losses are as high as -6% in Asia and -12.5% in Africa, but commercial and financial contagion spreads the shock globally.

³ The combination of heatwaves, droughts, and wildfires are assumed to occur in Asia in 2025, in South America in 2026, and in Africa in 2027. Floods and storms occur in Asia in 2028, in South America in 2029, and in Africa in 2030. These events are less severe than in Disasters and Policy Stagnation (return period of 1 in every 20 years).



FIG 1. WORLD GDP. % DEVIATION FROM BASELINE



The results are shown as differences from Baseline, to highlight the properties of individual scenarios. Source: BBVA Research from NGFS Short-Term Scenarios for central banks and supervisors May 2025

What are the key innovations of the NGFS's modelling approach?

- Modelling of Compound Extreme Climate Events: Some scenarios incorporate simultaneous occurrences of multiple climate hazards such as floods, storms, heatwaves, droughts, and wildfires, making them particularly effective for assessing systemic financial and economic risks.
- Cross-regional Transmission of Shocks: The scenarios explicitly model short-term spillover effects of both transition and physical shocks across regions through global trade and financial linkages. This innovation helps capture how climate impacts in one region can propagate globally, affecting financial stability and economic resilience worldwide. The scenarios provide detailed projections across a broad range of sectors (50 sectors) and countries (46 countries).
- Framework for Integrating Climate Risks with Business Cycles: By combining climate policies, extreme weather events, economic trends, and sectoral dynamics, the NGFS scenarios create a comprehensive framework to explore the interplay between climate risks and business cycles. In this vein, the NGFS's modeling approach captured the interactions and feedback mechanisms between the real economy and the financial sector (Figure 2).



FIG 2. TRANSMISSION CHANNELS AND FEEDBACK MECHANISMS IN THE NGFS SHORT-TERM SCENARIO MODELLING FRAMEWORK (*)



Source: NGFS Short-Term Scenarios for central banks and supervisors May 2025. (*) Due to the short time horizon of the NGFS short-term scenarios, impacts of emission trajectories onto short-term physical risk are not modelled

But, some caveats remain...The relevance of a scenario is defined by the combination of its probability of occurrence and the divergence (severity) from the baseline scenario. In this regard, some of the scenario narratives may have lost relevance since they were proposed more than two years ago, while others rely on a combination of highly improbable acute climate events, making them better suited to stress-testing exercises than to calibrating the impacts of reasonably likely events. While the scenarios employ a raft of modelling improvements, the whole exercise remains mired in "model land",⁴ stuck in simulations that bear little resemblance to the real world.

Net Zero relevance? The first category includes retaining a scenario such as **High Way to Paris**, which assumes a globally coordinated and orderly transition across geographies and sectors to reach net-zero by 2050 -an outcome that now appears increasingly unlikely. Being net zero at the end of the 2040s (having a zero emissions intensity ratio at that time) is in the very unlikely range (below 15%) with the current mix of activity and emissions **(Figure 3)**. To make a leap in emission intensity trend that sets its path on a trajectory consistent with net-zero, innovation for improving efficiency is necessary; and innovation is fostered by ambitious climate policies.⁵

Will climate policies among advanced economies move in the same direction? The three NGFS short term scenarios that include transition risks (Highway to Paris, Sudden Wake Up Call and Diverging Realities) share a common assumption: within the group of advanced economies there are no relevant differences in how climate policies behave; whether more or less ambitious or coordinated, they all aim at decarbonization. By contrast, the current U.S. government's policies

⁴ Simplistic NGFS climate scenarios are stuck in 'model land'. Mark Cliffe. Green Central Banking. May 14, 2025.

⁵ Still, net-zero may remain more plausible than the most extreme short-term physical risk scenarios in the short term. More importantly, given the NGFS's mandate of contributing to a sustainable economy, the inclusion of at least one net-zero scenario seems a necessary benchmark, even if it no longer represents a plausible case.



promote an energy mix centered on fossil fuels rather than renewables, hinder the transition to electric vehicles, and relax regulations on greenhouse-gas emissions.⁶

Why do transition and physical risks seem orthogonal? The NGFS treats transition and physical risks as surprisingly separable. Of the four scenarios, only one combines both types of risk (and even then, it does so asymmetrically by assigning physical risks to countries that do not transition); the others isolate either transition or physical impacts. This separation is conceptually awkward: acute physical risks are expected to intensify over the next five years, regardless of policy paths. While this division may be motivated by the desire to distinguish scenario narratives, it leads to inconsistencies. For example, transition scenarios exclude physical risk quantification entirely -even though near-term physical impacts are largely path-independent, driven by the atmospheric stock of greenhouse gases rather than marginal emission reductions. In Diverging Realities, for instance, physical events occur only in non-transitioning countries, ignoring the global nature of climate dynamics. Since emissions accumulate globally, no single country or bloc can insulate itself from physical risks merely by adopting ambitious policies.

Are feedback loops fully captured across the interactions of the three models? The NGFS modelling framework orchestrates three distinct models -GEM-E3, EIRIN, and CLIMACRED-like sections of a symphony: GEM-E3, a computable general equilibrium model, traces the reallocation of capital, labour, energy, and materials (KLEM⁷) under carbon pricing, mapping sectoral redistribution and innovation dynamics. EIRIN, a stock-flow consistent model with heterogeneous agents, introduces financial sector reactions: credit rationing under tighter capital requirements, household consumption elasticities by wealth quintile, and central bank responses via an extended Taylor rule incorporating climate variables. Finally, CLIMACRED translates these macro-financial trajectories into firm-level credit risk, sovereign spreads, and sector-specific capital costs by simulating cash flow degradation and asset loss from physical events. However, the modular nature of the NGFS modelling framework creates frictions in capturing dynamic, second-round feedback. Consider inflation: while the NGFS states that financial expectations, market stress, and monetary policy reactions, simulated in EIRIN and CLIMACRED, are subsequently fed back into GEM-E3 for a final aggregate pass, this integration appears only partial. In practice, inflation results are reported solely for EIRIN, not for GEM-E3, suggesting that these second-round effects are not fully reflected across all variables. The same applies to interest rates, which also seem disconnected from the financial stress outcomes derived from CLIMACRED. This compartmentalization means that macroeconomic variables, particularly inflation, may respond differently if the full loop, including financial frictions and asset revaluation, were consistently incorporated. As it stands, the separation between modules limits the system's ability to simulate the nonlinear, endogenous feedbacks that are central to understanding climate-financial macro dynamics.

⁶ <u>"Clean Energy Transition: Investors' Expectations Diverge, Driven by Decoupling Policies"</u>. BBVA Research. April 11, 2025.

⁷ KLEMS is a framework in economics used to analyze industry-level production and growth. It stands for capital (K), labor (L), energy (E), materials (M), and services (S) inputs, which are the main factors used in the production process. By tracking these inputs, KLEMS helps economists understand how changes in these factors contribute to overall economic growth and productivity.



FIG.3. WORLD. GHG INTENSITY. EMISSION PER UNIT OF GDP (1979=100)



Source: BBVA Research <u>Global. What are the most likely long</u> term climate scenarios? Not the most ambitious.

FIG. 4. U.S. CLIMATE POLICY UNCERTAINTY



Shaded areas correspond to the presidency of Donald J. Trump. Source: Gavriilidis, K. (2021). <u>Measuring Climate Policy</u> <u>Uncertainty by Konstantinos Gavriilidis</u>.

Highlights of the week





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