MOODY'S

Economics

Climate Risk Scenarios

Assess the risks posed by changing climate conditions

Climate change will affect economies through physical risks such as rising sea levels and transition risks such as higher energy costs and changes in energy consumption. As the threats from climate change mount, businesses are focusing on quantifying what these physical and transition risks mean for them.

Using the Moody's Analytics Global Macroeconomic Model, we have produced climate risk scenarios that enable organizations to analyze business impacts and stress their portfolios for the risks posed by climate change. Covering more than 18,000 macroeconomic variables, this expansive scope of climate-related macroeconomic data allows for selection from an extensive array of climate scenarios to accurately quantify both physical and transition risks.

Our offerings include:

- → Short- and long-term climate scenarios based on the guidance of the Network for Greening the Financial System (NGFS)
- → Regulatory climate scenarios, including the Bank of England, European Central Bank, and selected climate scenarios issued by other country regulators

Short-term climate scenarios

Climate risks are not exclusively a concern of the distant future; they are immediately pertinent to macroeconomic performance and business continuity. Understanding the near-term impact of climate risk has become an urgent concern for businesses, governments and financial institutions. The publication of the NGFS's short-term scenarios furthers this goal meaningfully. Short-term climate risk scenarios allow for the assessment of climate risk during a time frame pertinent for business planning. While long-term climate risk scenarios are key in assessing the total impact of climate change on the economy, moving shocks forward in the time horizon allows businesses to assess the immediate impact of climate on balance sheets.

- → Four short-term scenarios plus reference scenario
- → Five-year forecast horizon
- → Cover 70+ countries
- → Updated annually, and as NGFS releases updates

NGFS-Based Short-Term Climate Scenarios	
Highway to Paris	Technology-driven, orderly transition unfolds gradually
Sudden Wake-Up Call	Rapid climate action and shifting consumer preferences create a disorderly transition
Disasters & Policy Stagnation	Region-specific extreme weather events dislocate the global economy
Diverging Realities	Advanced economies pursue net-zero policies, while developing countries experience extreme weather
Baseline Scenario	Identical to Moody's Analytics baseline forecast

Long-term climate scenarios

Transition and chronic risk are more evident in long-term climate scenarios. This is when industries transition to a lower carbon footprint and new energy-efficient industries emerge. Chronic factors such as temperature rise begin to take a toll on worker health and productivity, and crops are impacted. Catastrophic weather events also become more intense and more frequent. The NGFS-based long-term scenarios present a variety of paths over the next 50 years, ranging from no action to net zero by 2050.

- → Seven NGFS-based long-term scenarios plus reference scenario
- → Coverage for 70+ countries and U.S. states and metro areas
- → 100-year horizon to 2100 for countries; 30-year horizon for U.S. states and metro areas
- → Updated biannually

NGFS-Based Long-Term Climate Scenarios	
Net Zero 2050	Immediate action taken to combat effects of climate change
Delayed Transition	Action taken in early 2030s after climate conditions worsen
Current Policies	No further action taken to combat climate change
Nationally Determined Contributions (NDC)	Countries enact planned policies, but no further policies added
Below 2°C	Global temperatures kept less than 2°C higher than pre-industrial levels
Fragmented World	Harsh transition policies in the early 2030s combined with higher physical risk
Low Demand	Technology change, rather than governmental policy, drives transition away from fossil fuels
Reference Scenario	Counterfactual scenario, no climate change

Moody's Analytics climate scenarios go above and beyond NGFS

Broad coverage and detailed insight into the economic impacts of climate risk not matched by the scenarios obtained directly from NGFS or other sources.

	Short-Term Scenarios	Long-Term Scenarios
Available for 70+ countries, significantly more than NGFS's published country coverage	✓	✓
Long-term scenarios also available for all U.S. states and metro areas		✓
Additional climate-specific macroeconomic data for 20+ countries	✓	✓
High-frequency forecasts with a horizon to 2100 for national-level climate scenarios and 30-year horizon for U.S. states and metro areas		✓
Industry-level forecasts	✓	✓
Reflects real-world impacts from cross-border linkages in Moody's Analytics Global Macro Forecast Model	✓	✓
More variable coverage in our global model with 20,000+ variables, including key climate risk factors like sectoral GVAs, real estate, financial markets, and fossil fuel emissions and prices	✓	✓
Updated Moody's Analytics standard baseline, with constantly refreshed historical data and forecasts. NGFS short-term scenarios use a lagged macroeconomic baseline	✓	
Consistent and transparent forecasts, with equations available to all subscribers, providing complete transparency to the forecasting process. NGFS does not publish equations	✓	✓
Higher frequency forecasts published at a quarterly periodicity, compared to NGFS's annual forecasts	✓	✓
Unified risks combining transition risk, and acute and chronic physical risk	✓	✓

Moody's Analytics offers the data, tools and expertise to help firms understand how to assess threats from our changing climate and effectively respond to evolving regulatory structures.

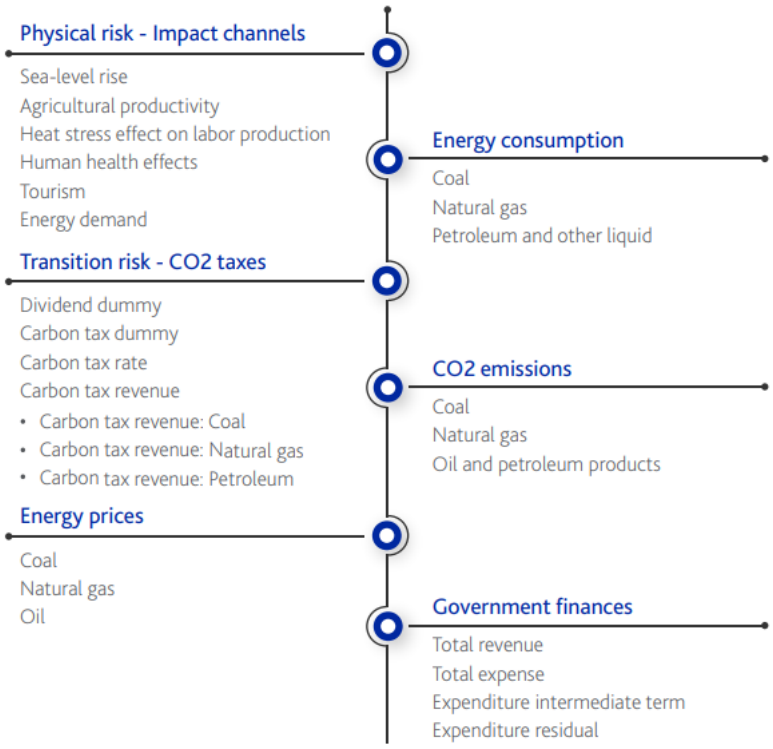
A flexible and transparent solution

- → Transparent and fully validated model and equations
- → Multiple delivery options, including our Data Buffet platform, API, and Excel Add-in
- → Direct access to economists
- → Exceptional customer support
- → Customizable scenario paths using our Scenario Studio platform

Our methodology

Moody's Analytics starts with the NGFS parameters for top-line variables, then expands the scenarios to extrapolate additional variables using our Global Macroeconomic Model.

A key to incorporating climate risk into traditional macroeconomic variables is including the trajectory for carbon prices. Carbon prices flow through the model via price channels, raising inflation rates, and central banks' reaction functions. As governments increasingly adopt carbon tax policies to limit the amount of carbon dioxide in the atmosphere, some industries are affected more adversely. These industrial transition risks are reflected in the forecasts produced by the Global Macroeconomic Model.



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