



Climate scenario analysis

July 2024 | by Nicholas Daly, Michelle Lin, Autumn Liu, Orest Pazumak, and Safa Waqar



Why is climate scenario analysis important?

Within the global community, there is scientific consensus that climate change is occurring. Nevertheless, the extent and severity of the impacts are uncertain. Climate scenario analysis is a type of sensitivity analysis that allows forward-looking business leaders and organizations to examine climate risk-mitigating strategies that may improve the resiliency of their operations. As regulators and associations develop guidance and policies for businesses, and industries set standards, organizations will increasingly adopt these frameworks to navigate the changing landscape—both nature and policy environments—to strategically manage their risks to explicitly account for a changing climate.

What are climate scenarios?

Climate scenarios describe different potential climate futures that can be analyzed via Representative Concentration Pathways (RCP) frameworks as well as other pathways. First defined in 2014 by the Intergovernmental Panel for Climate Change (IPCC), RCPs describe different greenhouse gas concentration trajectories. These pathways typically have two key characteristics: i) the average global temperature rise—which more directly affects physical risks¹ because rising temperatures result in more severe and frequent weather events, and ii) global climate policies that drive this potential temperature rise—which more directly affect transition risks² because as policies are implemented to lower emissions, this will result in a decrease in temperature rise at the cost of transitional risks to firms.

The IPCC has defined seven different RCPs in total, ranging from RCP 1.9 associated with the lowest temperature rise, to RCP 8.5 associated with the highest temperature rise. Each scenario provides different transitional and physical risk data that analysts can use to project future economic impacts based on different climate change pathways.

The Shared Socioeconomic Pathways are a second set of scenarios based on socioeconomic global changes in greenhouse gas emissions. Within the framework, there are five pathways, each that highlights a different intersection of ethics and economic development. Combining the frameworks of expectations and response, economists, policy makers, and businesses can set informed expectations. With an expanded set of expectations, strategies and responses can be formulated. Thus, RCPs outline potential outcomes depending on greenhouse gas levels in the atmosphere, while Shared Socioeconomic Pathways identify potential types of coordinated public responses that could be adopted across jurisdictions.



Climate scenario analysis is a type of sensitivity analysis that allows forward-looking business leaders and organizations to examine climate risk-mitigating strategies that may improve the resiliency of their operations.

¹ Physical risks are risks related to the physical impact of climate change (source: US EPA Climate Risks and Opportunities Defined | US EPA).

² Transition risks are risks related to the transition to a lower-carbon economy (source: US EPA Climate Risks and Opportunities Defined | US EPA).

What do climate scenarios mean for businesses and organizations?

Each business and organization faces a different combination of climate-related risks and opportunities due to differences in markets, geographic locations, customers, supply chains, assets, and key stakeholders. Depending on these factors, the operational impact may vary significantly, but the key fact is that climate scenarios allow businesses and organizations to address climate risks in their strategic and financial plans. For strategic plans, businesses can use climate scenario analyses to project the performance of their current investments and portfolios to identify new strategies that take into consideration the effect of climate across sectors, regions, and assets. For financial plans, businesses can estimate a baseline of carbon emissions, understand the impact of commitments to net zero, and figure out what is expected to happen financially in the world in different climate scenarios.

Businesses and organizations can use climate scenarios to strategically manage their risks relating to both financial or budgetary strategies and investment strategies. Specifically, climate scenarios can be used strategically to understand and identify how to mitigate and adapt to climate-related risks, as well as opportunities to drive climate-resilient productivity and growth. Some common transition and physical climate-related risks and opportunities include:

01

Market and technology shifts: policies and investments to deliver a low carbon emission economy;

02

Reputation: growing expectation and demands for climate-sensitive conduct from key stakeholders, such as investors, lenders, and customers;

03

Policy and legal: an evolving patchwork of regulatory requirements at international, national, and state level; and

04

Climate extremes: chronic changes and more frequent severe climate extremes, such as storms and droughts.

Indeed, companies and organizations are increasingly understanding the value of climate scenario analyses and have begun to conduct them to understand specific risks and opportunities related to climate change. For example, in January 2023, the

Board of Governors of the Federal Reserve System announced that they are conducting a pilot climate scenario analysis program to better understand large banking organizations' climate risk-management practices and challenges. The program's goal is to enhance the ability of both large banking organizations and supervisors to identify, measure and monitor, and mitigate climate-related financial risks.



Climate scenarios allow businesses and organizations to address climate risks in their strategic and financial plans.

Banks have always diversified their portfolios to minimize risks of losses on their balance sheet; thus, banks may increasingly view climate risks through a different lens since a portfolio's climate-related financial risks affect all traditional risks such as credit, operational, market, and liquidity risks. For example, if a bank's portfolio is heavily invested in coastal real estate development sites, the potential risk of repeated and more severe flooding or other extreme weather events, may result in large financial losses from these investments over time. Similarly, if a portfolio is heavily invested in businesses with high GHG emissions, the additional fines or inability to adopt more renewable energy may affect that portfolio's returns. As climate risks become a greater ongoing challenge, banks may increasingly revise their strategic risk review through a financial risk lens.



Why now?

There are two primary drivers for climate scenario action: regulatory and voluntary. Within the U.S. regulatory sphere, several entities such as the Financial Stability Oversight Council (FSOC), Federal Reserve Board (FRB), the Securities and Exchange Commission (SEC), California's Climate-Related Financial Risk Act (SB 261), and the Office of the Comptroller of the Currency (OCC) have set expectations for regulatory requirements. For each of these entities, risk avoidance is a critical factor when looking at the future outcomes of both physical and transition risks. Internationally, the EU's Corporate Sustainability Reporting Directive (CSRD) and related European Sustainability Reporting Standards (ESRS) require climate scenario analysis for corporate entities. Internationally, the EU's Corporate Sustainability Reporting Directive (CSRD) and related European Sustainability Reporting Standards (ESRS) require climate scenario analysis for corporate entities.

Aside from regulatory incentives, customer demand and internal risk management are also important drivers in developing climate-resilient strategies. But voluntary adoption of climate scenario action is a more nuanced situation. Although many jurisdictions have not implemented mandatory climate scenario analyses, organizations are realizing it is in their best interest to be prepared, manage their climate risks, and leverage their opportunities; this is true for governments, publicly traded companies, privately owned businesses, and even private equity funds as they seek a better understanding of the climate risks for the industries in which they invest or operate, and the wider economic trends. Thus, demand from key stakeholders such as investors and customers are encouraging companies and organizations to act now.



Summary

As climate risks unfold, more businesses and organizations are learning to strategically adapt to minimize their risks and leverage new opportunities. Businesses and organizations can be better prepared for any potential future climate outcome by using climate scenario analysis to understand how to adapt their operations by implementing innovative solutions to maximize success in an ever-evolving global environment.

Contact us

Erkan Erdem
Principal, Tax
E: erkanerdem@kpmg.com

Learn about us:  [kpmg.com](https://www.kpmg.com)

Some or all of the services described herein may not be permissible for KPMG audit clients and their affiliates or related entities.

The information contained herein is of a general nature and is not intended to address the circumstances of any particular individual or entity. Although we endeavor to provide accurate and timely information, there can be no guarantee that such information is accurate as of the date it is received or that it will continue to be accurate in the future. No one should act upon such information without appropriate professional advice after a thorough examination of the particular situation.

© 2024 KPMG LLP, a Delaware limited liability partnership and a member firm of the KPMG global organization of independent member firms affiliated with KPMG International Limited, a private English company limited by guarantee. All rights reserved. The KPMG name and logo are trademarks used under license by the independent member firms of the KPMG global organization. USCS016447-2A