

**Minutes of the Climate-related Financial Risk Advisory Committee
of the Financial Stability Oversight Council**

July 30, 2024

PRESENT:

Department of the Treasury (Treasury)

Sandra Lee, Deputy Assistant Secretary for the Financial Stability Oversight Council (Council)
and Chairperson of the Climate-related Financial Risk Advisory Committee (CFRAC)

CFRAC Members

Bob Litterman, Founder of Kepos Capital and Presiding Member of the CFRAC

Catherine Ansell, Executive Director of Climate Risk, JPMorgan Chase

Ed Kearns, Chief Data Officer, First Street Foundation

Laura Bakkensen, Associate Professor, University of Arizona's School of Government and
Public Policy

Noah Kaufman, Research Scholar, Columbia University School of International and Public
Affairs, Center on Global Energy Policy (via videoconference)

Viral Acharya, C.V. Starr Professor of Economics, New York University Stern School of
Business, Department of Finance

William Pizer, Vice President for Research and Policy Engagement, Resources for the Future

Emily Grover-Kopec, Director, Energy and Climate Practice, Rhodium Group

Ivan Frishberg, Senior Vice President and Chief Sustainability Officer, Amalgamated Bank

Janine Guillot, Board Member, B Lab Global

Karen Diver, Senior Advisor to the President for Native American Affairs, University of
Minnesota

Wendy Cromwell, Vice Chair and Head of Sustainable Investment, Wellington Management

Tracey Lewis, Policy Counsel for the Climate Program, Public Citizen

GUESTS:

Treasury

Silab Mohanty, Deputy Director of Policy, Office of the Financial Stability Oversight Council

Kaitlin Hildner, Senior Policy Advisor, Office of the Financial Stability Oversight Council

Ethan Schwartz, Senior Policy Advisor, Office of the Financial Stability Oversight Council

Catherine Aquilina, Policy Advisor, Office of the Financial Stability Oversight Council

Chandni Saxena, Policy Advisor, Office of the Financial Stability Oversight Council

Harini Parthasarathy, Detailee, Office of the Financial Stability Oversight Council

Adya Mahajan, Detailee, Office of the Financial Stability Oversight Council

Catherine Berg, International Economist, Office of International Financial Markets

Patrick Coe, Policy Advisor, Office of Capital Markets

Phoebe Hering, Special Assistant, Climate Hub

Benjamin Floyd, Intern, Climate Hub

Board of Governors of the Federal Reserve System (Federal Reserve)

Morgan Lewis, Manager, Division of Supervision and Regulation

Adele Morris, Senior Advisor, Financial Stability

Kevin Stiroh, Senior Advisor, Supervision and Regulation
Caroline Norris, Financial Analyst, Financial Stability Climate Committee

Federal Deposit Insurance Corporation (FDIC)

Amy Beck, Corporate Expert, Sustainable Finance, Division of Risk Management Supervision
Juan Cardenas, Senior Complex Financial Institution Specialist, Complex Institution Supervision
& Resolution
Andrew Carayiannis, Chief, Capital Market Strategies

Securities and Exchange Commission (SEC)

Mika Morse, Climate Policy Counsel

Commodity Futures Trading Commission

Diana Dietrich, Assistant General Counsel

Consumer Financial Protection Bureau (CFPB)

Eric Rubinyi, Financial Analyst, Office of Mortgage Market

Federal Housing Finance Agency (FHFA)

Jessica Shui, Supervisory Economist, Division of Research and Statistics
Charles Hu, Supervisory Financial Analyst, Office of Capital Policy

Comptroller of the Currency (OCC)

Yue (Nina) Chen, Chief Climate Risk Officer
Timothy Stumhofer, Director of Climate Risk
Naresh Raheja, Senior Climate Risk Specialist, Office of Climate Risk

National Credit Union Association (NCUA)

Rachel Cononi, Deputy Director, Office of the Chief Economist

Office of the Independent Member with Insurance Expertise

Charles Klingman, Senior Policy Advisor

Federal Reserve Bank of New York (FRBNY)

João Santos, Director of Financial Intermediation Policy Research

Office of Financial Research (OFR)

Cornelius Crowley, Deputy Director for Data
Dasol Kim, Research Principal
Mariah Arraya, Management & Program Analyst

Federal Insurance Office (FIO)

Elizabeth Brown, Senior Insurance Regulatory Policy Analyst

New York State Division of Financial Services (NYDFS)

Catherine Doll, Assistant Counsel

PRESENTERS:

Presentation on First Charge Question: What data on human response factors should be considered when assessing climate risk and financial stability?

- Emily Grover-Kopec, Director, Energy and Climate Practice, Rhodium Group
- Ed Kearns, Chief Data Officer, First Street
- Tracey Lewis, Policy Counsel for the Climate Program, Public Citizen

Presentation on the Federal Reserve Pilot Climate Scenario Analysis Exercise

- Morgan Lewis, Manager, Division of Supervision and Regulation, Federal Reserve
- Kevin Stiroh, Senior Advisor, Supervision and Regulation, Federal Reserve

1. Welcome and Opening Remarks

Sandra Lee, Chairperson of the CFRAC, called the meeting to order at approximately 11:00 A.M. The committee convened by videoconference.

The Chairperson began by describing the agenda for the meeting, including one charge presentation and a presentation by staff of the Federal Reserve on the results from the Federal Reserve Pilot Climate Scenario Analysis Exercise. She said that there would be a small group exercise to reflect on learnings from past CFRAC charge presentations and discuss how such learnings could shape future CFRAC work.

2. Presentation on First Charge Question

The Chairperson turned to Bob Litterman, Founder of Kepos Capital and Presiding Member of the CFRAC, to introduce the presenters for the first charge question: *What data on human response factors should be considered when assessing climate risk and financial stability?* Mr. Litterman called on Emily Grover-Kopec, Director of Energy and Climate Practice at Rhodium Group; Ed Kearns, Chief Data Officer at First Street Foundation; and Tracey Lewis, Policy Counsel for the Climate Program at Public Citizen, to begin their presentation.

Mr. Kearns noted that there had been significant news coverage about climate-related challenges in the insurance market. He said that data on human response factors to climate change are important to understanding how micro effects could filter through financial institutions to create macro effects on the larger economy. He said that while some data on human response factors are available, such as U.S. Census data on where Americans choose to live and work, there is no comprehensive database on human response factors to climate risk. He said that understanding human response factors requires asset-specific information about climate risks and mitigants.

Mr. Kearns said that recently there had been increased interest in understanding the effects of climate migration in the US. He said that a recent First Street analysis of moves at a Census block resolution found that people responded to flood risk by moving to higher ground, but that this signal was obscured at a Census tract or county-level resolution. Mr. Kearns noted recent

studies on consumers adapting to asset-level climate risk information. He said that Redfin conducted an A/B study to understand the impact of providing climate risk information on homebuying decisions. He said that the study found evidence that climate risk information, particularly information on significant levels of climate risk, influenced potential homebuyers' decision-making. He said that a Freddie Mac analysis of responses to changes in Texas's flood disclosure laws showed market adjustments through real estate values. He also said that Redfin research had connected higher flood risk to areas that were racially redlined. He said that a recent Congressional Budget Office report found that flood insurance uptake was low, even within the Federal Emergency Management Agency special flood hazard zones.

Ms. Grover-Kopec said that two of the primary pathways of how climate risk would most likely influence bank balance sheets are through property valuations and default risk. She said that research suggested that climate risk affects housing values, but other factors, such as insurance costs, beliefs about climate risks, housing supply availability, and amenities, could also influence the relationship between climate risk and housing values. She said that a recent study found that U.S. properties are overvalued by \$187 billion due to flood risk, and that most of the overvaluation is concentrated in relatively few areas.

Ms. Grover-Kopec said that climate-related disaster risks were affecting the affordability of home insurance, which is a driver of insurance take-up and, ultimately, default risk for banks. She referenced recent research showing a 33 percent increase in insurance premiums. She said that the research found that premium increases are attributable to a range of factors, including climate risk. She noted that while the largest premium increases are occurring in areas with the highest climate risk, the study found increases in premiums across all levels of climate risks, which suggested that there was a level of disconnect between risk and premiums. She said that state-level regulation, incidents of fraud, inflation, and reinsurance costs could all contribute to premium increases.

Citing a recent study by the OFR, Ms. Grover-Kopec said that competition plays a role in whether banks account for climate risk. She said that the OFR study found that banks impacted by Hurricane Harvey were more likely to update internal risk models for climate and flood risk, but impacted banks experiencing increased competition were less likely to account for climate risks in internal risk models.

Ms. Grover-Kopec said that data should be monitored to understand the risks that climate change will pose to communities, particularly since those risks will disparately impact more vulnerable communities.

Ms. Lewis said that climate change is affecting wealthier communities less because they are able to absorb some of the risks that low-income communities cannot. She said that by not adequately pricing in climate risk, lenders could incentivize building real estate in areas that are known to face high risks of climate disasters and lead to underinvestment in hazard mitigation. She said that climate risk education is important to help consumers understand potential climate risks and make informed decisions.

Ms. Lewis said that Hurricane Katrina was an example of the potential for climate risk to disparately impact vulnerable communities. She said that the hurricane resulted in mass displacement of residents in New Orleans, much of which was permanent. She said that Black communities in New Orleans were most affected, and she noted that the majority of families displaced or who lost their homes after the hurricane were Black. She said that many of the resources designed to help residents affected by the hurricane were available only to homeowners, not renters.

Ms. Lewis said that nationwide flood costs were very high, referencing a study that estimated such costs at \$180 billion in 2023. She said that managing those costs would take a whole-of-government approach, because the National Flood Insurance Program would not be sufficient.

Ms. Lewis said that it is important to consider how the impact on the financial system when costs from climate disasters exceed consumers' ability to pay. She said that to respond to such risks, the federal government needs to work with state governments. She said that there should be additional focus on community banks, the role of financed emissions, and insurance availability and affordability. She said that there should also be more research to understand the impacts of climate change on formerly redlined communities and how they affect access to credit. She said that financial institutions should leverage the Community Reinvestment Act and the Inflation Reduction Act's Greenhouse Gas Reduction Fund to invest in climate resilience in low-income communities and communities of color.

Ms. Lewis said that the historically Black neighborhood of Liberty City in Miami provides an example of climate gentrification, because investors are investing in – and wealthier residents are moving to – Liberty City's higher elevation areas in response to increased flood risks. She said that the Shore Acres neighborhood of St. Petersburg provided an example of where the Federal Emergency Management Agency provided a program to assist homeowners to raise their homes. She said that the program allowed residents to stay in place for some time, but the subsidy may only provide a temporary solution given continual flooding.

Ms. Lewis referenced a paper that provided scenarios of how pricing climate risks could lead to an array of shifts in the housing market, including a market crash and a soft-landing scenario.

Following the charge presentation, participants discussed the role of heterogeneity in resources, the impact of discrimination in this area, and other factors affecting consumer responses; the difficulty in procuring asset-level data for risk assessment and risk monitoring; the importance of conducting sensitivity analysis on information shared with consumers; the role of the federal government in addressing issues in the insurance market; evidence of blue-lining (the practice of incorporating climate risks into credit risk calculations for lending purposes); concerns about future uncertainty in home price values due to climate risk and its implications for homeowners' wealth; and the role of risk pooling to mitigate rapid repricing of insurance.

3. Presentation on the Federal Reserve Pilot Climate Scenario Analysis Exercise

The Chairperson introduced Morgan Lewis, Manager in the Division of Supervision and Regulation at the Federal Reserve, and Kevin Stiroh, Senior Advisor for Supervision and Regulation at the Federal Reserve, to present on the results from Federal Reserve's Pilot Climate Scenario Analysis Exercise. Mr. Stiroh said that the exploratory exercise was intended to generate information about banks' practices and challenges for managing climate risk and to enhance the ability of supervisors and large banking organizations to identify, estimate, monitor, and manage climate-related financial risks. He said that for the exercise, the Federal Reserve provided hypothetical shocks, and the participating banks provided data and loan-level variables to estimate loan-level impacts using the banks' credit models. He said that the Federal Reserve asked banks to model physical and transition risk impacts separately. He said that for physical risk, the Federal Reserve provided banks with a common shock of a hurricane in the northeastern United States and asked banks to provide a second shock for physical risk based on materiality to their business models and exposures. He said that to model transition risk, the Federal Reserve asked banks to look at the Network of Central Banks and Supervisors for Greening the Financial System scenarios using a 10-year horizon.

Mr. Stiroh said that the Federal Reserve wanted to learn about the range of practices by banks and found that participating banks took different approaches to translating the scenarios into impacts from credit risk models. He said that banks reported significant data and modeling challenges, including challenges obtaining sufficiently detailed property-level data, insurance data, and transition risk data. He said that banks also discussed the uncertainty of the forward-looking models and whether the results would be sufficiently reliable to inform business decisions.

Ms. Lewis said that to assess the impacts of the Federal Reserve-provided common shock, some banks used hurricanes based on historical examples, while other banks used hypothetical hurricane events developed using catastrophe models. She said that there was significant variation in how banks approached the analysis based on differences in business models, experience with vendors, and prior experience conducting similar exercises for other regulators. She said that modeling with and without insurance provided a measure of the effectiveness of insurance to mitigate costs. She said that the process of conducting the exercise highlighted the importance of certain design choices to the outcomes of the scenario analysis, such as using only a one-year time horizon, limiting cumulative effects of disasters over multiple years, and choosing a strong year as a starting point.

Ms. Lewis said that on average, participating banks' estimates of loan-level probability of default increased with the severity of the shock and in a scenario where insurance was not available. She said that the idiosyncratic shock selected by the participating banks had larger effects on the probability of default than the common shock posed by the Federal Reserve. She said that most loans had a relatively small increase in the probability of default, but a small number of loans had a much more significant increase (greater than 500 basis points) in the probability of default.

Ms. Lewis said that there were significant differences in how the participating banks approached the design of the transition risk models, including how the banks incorporated the 10-year time

horizon and how firms downscaled macroeconomic variables to more localized geographies. She said that banks approached exposures across different sectors differently and some banks were able to incorporate information from clients. She said that transition risk models had a larger impact on the probability of default for the commercial real estate portfolio than for the corporate loan portfolio. She said that similar to physical risk, transition risk had little impact on the probability of default for most corporate loans, but a small number of corporate loans had a transition risk impact of more than 500 basis points. She said that the Federal Reserve looked at the impact from transition risk on common obligors who receive credit from multiple participating banks and found significant variation in the estimated impacts.

Ms. Lewis noted that press coverage of the exercise focused on data gaps and modeling challenges. She said that the Federal Reserve had indicated that it would continue to engage with participating banks on these issues but had not made a decision about whether it would organize another exercise in the future.

Following the presentation, the Chairperson introduced Catherine Ansell, Executive Director of Climate Risk at JPMorgan Chase, to provide further perspective on the Federal Reserve Pilot Climate Scenario Analysis Exercise. Ms. Ansell said that the exercise provided participating banks with significant flexibility in how they approached the exercise. She said that those design choices impacted the results, noting for example that a one in one-hundred-year natural disaster event could lead to different outcomes than a one in one-hundred-year loss event. She said that her firm had devoted substantial resources devoted to the exercise, including audits and controls. She also said that the exercise provided an opportunity to explore and build capacity to conduct scenario analyses.

Following the presentation, participants discussed the goals of the exercise and the impact of various design choices; how a similar exercise could be useful for the insurance sector; modeling indirect effects; and learnings derived from the exercise.

4. Small Group Discussions Reviewing Past CFRAC Charge Presentations and Considering Future Work

Kaitlin Hildner, Senior Policy Advisor in the Office of the Financial Stability Oversight Council at Treasury, then divided attendees into five groups for a discussion regarding past CFRAC charge presentations and considerations for future CFRAC work.

Following the separate group discussions, the Chairperson invited a member from each group to summarize their discussion.

Mr. Pizer said that Group 1 discussed a range of issues on climate-related financial risk, including macroeconomic risks, the federal government balance sheet, equity impacts of climate risk, insurance, and the impact of compounding events. He said that the group discussed how potential indirect effects from climate-related financial risks may not be as well understood. He said that the group discussed the types of quantitative analyses that could be used to understand potential scenarios that could lead to financial stability concerns.

Ms. Guillot said that Group 2 discussed indirect effects from climate-related financial risks, such as climate migration, declining availability of property insurance, and their impact on the larger economy. Ms. Bakkensen said that Group 2 also discussed how “unknown unknowns” – including potentially low-probability factors or linkages that the group had not previously considered – could affect the financial system. Ms. Ansell said that the group discussed a potential charge describing scenarios to better understand various indirect effects.

Mr. Acharya said that Group 3 discussed human behavior in response to extreme events, including adaptation; competition as a hindrance to factoring risk into pricing; and the insurance sector. He said that the group discussed the feasibility of a reverse stress test of the insurance sector and how issues in the insurance sector could lead to uncertainty in the housing market. Morgan Lewis said that the group also discussed transition risk metrics and whether emissions would be an accurate proxy for credit risk. Tracey Lewis said that the group discussed the need for more research on financial practices where financial institutions raise prices or withdraw services from high climate risk areas, or blue-lining.

Ms. Cromwell said that Group 4 discussed potential future CFRAC charges, including the impediments to a soft-landing scenario; indirect effects; compound risks; the differences in outcomes from chronic versus acute risks; a proposed pathway for the United States for transition risk; and identifying uncertainties in climate models.

Mr. Frishberg said that Group 5 discussed the significance of physical versus transition risk; reverse stress analyses; inequality; insurance; and whether regulators have the tools they need to address climate-related financial risk.

Following the discussion, the Chairperson offered closing remarks.

The meeting adjourned at approximately 3:00 P.M.