

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

November 15, 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

Cecilia Martinez, Chief of Environmental and Climate Justice, Bezos Earth Fund (via  
videoconference)

Ed Kearns, Chief Science Officer, First Street Foundation

James Stock, Vice Provost for Climate and Sustainability, Harvard University

Laura Bakkensen, Associate Professor, University of Arizona's School of Government and  
Public Policy (via videoconference)

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

Peter Wilcoxon, Professor, Syracuse University, Department of Public Administration and  
International Affairs

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

William Pizer, President and Chief Executive Officer, Resources for the Future (via  
videoconference)

Emily Grover-Kopec, Director, Climate Impacts, Rhodium Group

Ilimi Granoff, Senior Fellow and Adjunct Research Scholar, Columbia Law School

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

Janine Guillot, Director, ReFED

Julie Leonard, President and Chief Executive Officer, Lake Michigan Credit Union

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 (via  
videoconference)

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

Allen Fawcett, Director of Joint Global Change Research Institute, U.S. Department of Energy's  
Pacific Northwest National Laboratory and the University of Maryland at College Park

Julie Serakos, Managing Director, Model Product Management, Moody's

Nancy Watkins, Principal and Consulting Actuary, Milliman

GUESTS:

Department of the Treasury

Janet L. Yellen, Secretary of the Treasury

Sean Hoskins, Director of Policy, Office of the Financial Stability Oversight Council  
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  
Jack Immanuel, Research Analyst, Office of the Financial Stability Oversight Council  
Carol Rodrigues, Attorney-Adviser, Office of the General Counsel  
Catherine Berg, Deputy Director, Office of International Financial Markets  
Luke Bassett, Senior Advisor, Climate Hub  
Phoebe Hering, Special Advisor, Climate Hub  
Jacob Mason, Special Advisor, Climate Hub  
Burcu Duygan Bump, Counselor to the Under Secretary for Domestic Finance  
Dean (Wilson) Ervin, Climate Counselor

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

Morgan Lewis, Manager, Division of Supervision and Regulation  
Adele Morris, Senior Advisor, Financial Stability  
Caroline Norris, Senior Financial Institution Policy 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

Securities and Exchange Commission (SEC)

Mika Morse, Climate Policy Counsel

Consumer Financial Protection Bureau (CFPB)

Eric Rubinyi, Financial Analyst, Office of Mortgage Market

Federal Housing Finance Agency (FHFA)

Jessica Shui, Associate Director, 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 Association of Insurance Commissioners (NAIC)

Timothy Nauheimer, Manager, Macroprudential Supervision

National Credit Union Association (NCUA)

Todd M. Harper, Chairman  
Rachel Cononi, Deputy Director, Office of the Chief Economist  
Lisa Roberson, Deputy Director, Office of Consumer Financial Protection

## PRESENTERS:

*Presentation on First Charge Question: Some smaller financial institutions may face disproportionately larger climate-related financial risks than their larger counterparts, but with fewer resources to identify, measure, and monitor these risks. What should smaller financial institutions do to manage these risks? What information, data, or resources are needed to help smaller financial institutions manage climate-related financial risk?*

- Julie Leonard, President and CEO, Lake Michigan Credit Union
- Ed Kearns, Chief Science Officer, First Street

*Presentation on the Financial Stability Climate Risk Drivers Project*

- Wendy Cromwell, Vice Chair and Head of Sustainable Investment, Wellington Management
- Ivan Frishberg, Senior Vice President and Chief of Sustainability Officer, Amalgamated Bank
- Ed Kearns, Chief Science Officer, First Street
- Emily Grover-Kopec, Director, Climate Impacts, Rhodium Group

### 1. Welcome

Sandra Lee, Chairperson of the CFRAC, called the meeting to order at approximately 9:00 A.M. The Chairperson began by expressing her appreciation for the CFRAC members and their diverse outside perspectives. She said that the outside expertise of the CFRAC members improved the Council's understanding of how climate change impacts the financial sector.

The Chairperson then introduced Janet Yellen, the Secretary of the Treasury.

### 2. Opening Remarks

Secretary Yellen began her remarks by describing the origins of the CFRAC, the Council's first annual report to identify climate change as a threat to U.S. financial stability, which was issued in 2021, and the inaugural meeting of the CFRAC that she attended in March of 2023. She said that she was grateful for the diverse backgrounds and expertise that the CFRAC members brought to their meetings. She said that the CFRAC members made important contributions to identifying and assessing climate-related financial risks, including the development of a framework for determining how climate risk drivers translate to financial risks, the assessment of pricing in climate risks, and the consideration of reverse stress analyses.

Secretary Yellen said that the work of the CFRAC aligns with other efforts across the Biden-Harris Administration and Treasury, including work on addressing data gaps for analysis of climate-related risk and integrating climate change into macroeconomic models. She said that Treasury engaged in these efforts globally by helping develop forward-looking metrics for physical and transition climate-related financial risks with the Financial Stability Board. She

said that Treasury also advanced international modeling approaches through the Coalition of Finance Ministers for Climate Action.

Secretary Yellen said that the efforts of the CFRAC complement the broader climate agenda of Treasury. She said that the Inflation Reduction Act is the most significant climate legislation in history, including tax credits for clean energy promotion and about half a trillion dollars in investments in clean energy manufacturing and technologies. She noted that Treasury developed Principles for Net-Zero Financing & Investment. She also noted that Treasury and other agency partners published a Voluntary Carbon Markets Joint Policy Statement and Principles.

On an international level, Secretary Yellen said that Treasury was working to expand derisking tools, such as guarantees, and close data gaps to drive investments in emerging markets. She said that Treasury worked with global partners, including Indonesia, South Africa, and Vietnam, to implement the Just Energy Transition Partnerships within these countries. She said that Treasury collaborated with the multilateral development banks to prioritize climate goals. She said that the multilateral development banks committed nearly \$75 billion in climate finance to low- and middle-income countries in 2023, which she said represented a 45 percent increase from 2021.

### 3. 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: *Some smaller financial institutions may face disproportionately larger climate-related financial risks than their larger counterparts, but with fewer resources to identify, measure, and monitor these risks. What should smaller financial institutions do to manage these risks? What information, data, or resources are needed to help smaller financial institutions manage climate-related financial risk?* Mr. Litterman called on Julie Leonard, President and CEO at Lake Michigan Credit Union, and Ed Kearns, Chief Science Officer at First Street, for the presentation.

Mr. Kearns said that their goal at First Street was to analyze how smaller financial institutions manage climate-related financial risk and identify the resources that are needed by these smaller institutions. He said that First Street created a generalized national risk assessment to conduct a cross-peril analysis of property damage and map the portfolio-specific risk of climate change. He noted that they created two sample portfolios that were identical except they modified the risk profile of 15 percent of properties within the same zip codes in one of the portfolios. He noted that by increasing the risk of 15 percent of properties, this portfolio faced a 280 percent increase in losses in the model. This demonstrated the sensitivity of portfolio analyses to property-specific risk information.

Mr. Kearns said that First Street estimated the climate impact on bank portfolios by estimating the physical climate risks at bank branch locations as a proxy for their lending portfolios. He said that, overall, smaller banks were shown to have a higher likelihood of damage from climate-

driven events than larger banks. He said that 57 banks in their assessment experienced material risk as defined by the SEC's 1 percent threshold for material risk in a portfolio, with smaller banks more vulnerable, due to the more limited geographic distribution of their assets.

Mr. Kearns said that to manage these risks, smaller financial institutions should measure the effect climate change could have on their portfolios, which would include precise assessments of the vulnerability of properties in the portfolio and probability of default. He said that macroeconomic implications from climate-related financial risks are likely to first come through property values and that insurance is the first mechanism to price climate into the real estate market. He said that the insurance industry has responded to increasing property damages from climate events by increasing premiums, and he noted the particularly large increases in Florida and North Carolina in recent years. He said that there are drastic changes in premiums on a state-by-state basis since there are extensive regulatory differences between each state within this industry.

Ms. Leonard said that smaller financial institutions must balance a number of competing priorities, including regulatory and compliance requirements, which can make it difficult to devote resources toward managing climate-related financial risk. She said that the best mitigation strategy for managing climate risks is advance planning.

Ms. Leonard noted that governance, data, and resources present key challenges for small financial institutions' management of climate risk. She said that governance challenges arise from the lack of prioritization of climate-related financial risks; the focus on managing climate risks rather than leveraging opportunities associated with climate change; and the lack of oversight and accountability over managing climate risk in the industry. She said that a lack of understanding of climate change impacts as well as difficulty accessing necessary data points and forward-looking models on climate risks present key data challenges for small financial institutions. She said that small financial institutions also may not be aware of effective and inexpensive tools to assess climate risks and may not have the resources to engage with consultants or compete to acquire talent with climate risk knowledge.

Ms. Leonard said that there are solutions to advance climate-related financial risk management at small financial institutions. On governance, she said that it is important to explain the reason behind climate-related financial risk management to stakeholders and that board involvement could help set the tone from the top and provide clear expectations. She said that there is a need to facilitate partnerships with vendors, trade associations, and grass roots organizations on climate-related financial risk management and governance. On data, she said that it would be helpful to work with partners to identify a list of accessible data sources and noted that it would be helpful to be able to look at a portfolio of customers and identify what climate risks could affect them. She said that scenarios would help small financial institutions identify risks and mitigate shifts in market demands, changing consumer preferences, and asset value changes. She said that to address challenges associated with resources, small financial institutions should not face the same regulatory expectations as large financial institutions, and that a longer runway is

needed for smaller financial institutions' transitions. She said that the shift to the Current Expected Credit Losses accounting standard could serve as a blueprint for a smooth transition across the industry.

Following the charge presentation, participants discussed clarifications to the analysis; the level of confidence in forward-looking physical climate risk models at a property level; the connections between small financial institutions and small businesses; the importance of modeling the full distribution of potential losses as opposed to just average expected losses; opportunities for regulators to help provide loan-level climate data to small financial institutions; the importance of understanding current climate risk exposures rather than just future climate risks; the role that moral hazard plays in managing climate risks; how climate risks to small financial institutions could be transmitted to the broader financial system; methods for making it easier to compare climate risk models; the role of regulators to help manage model uncertainty at small financial institutions; methods for incentivizing the purchase of flood insurance; examples of public-private partnerships to improve understanding of climate risk models in the insurance industry; the potential role for local government to build climate risk into property assessments; who bears the costs of climate risk's effects on the insurance sector; and the use of securitization as a tool for small financial institutions to manage climate risks in their mortgage portfolios.

#### 4. Fireside Chat with NCUA Chairman Todd Harper

The Chairperson introduced Todd Harper, Chairman of the NCUA, and asked him about the role NCUA plays in promoting financial stability and how climate-related financial risk factors into that role. Chairman Harper described the size of and diversity of the credit union system, which includes 4,500 credit unions, 40 percent of which are state-chartered and insured by NCUA and 60 percent of which are federally regulated and insured. He said that given the NCUA's role as an insurer of credit union deposits, NCUA wants credit unions to measure, monitor, and mitigate losses to the Share Insurance Fund. He said that mortgage lending accounts for roughly 50 percent of credit unions' total loans outstanding and that climate risks could affect risks to mortgage portfolios. As an example, he said that two credit unions in New Orleans failed following Hurricane Katrina in 2005.

Chairman Harper described recent efforts at NCUA to understand how climate change could affect the credit union system. He noted recent research produced by the NCUA's Office of the Chief Economist, which found that a quarter of credit unions and a third of the system's assets are in high climate risk areas. He said that one of every two minority-owned depository institutions is in a high-risk area. He said that following Hurricane Helene, credit union branches in North Carolina faced operational disruptions. He said that looking forward, it is difficult to know what the total losses from climate events could be and whether they would lead to capital drawdown risks that reach levels that would necessitate NCUA action. He also noted the potential for climate risks to affect the insurance industry, which he said could ultimately affect the mortgage industry, given mortgage requirements that consumers hold insurance.

The Chairperson then asked Chairman Harper about the differences between how climate-related financial risks could affect smaller institutions and credit unions compared to large banks. Chairman Harper said that smaller financial institutions are more limited geographically and consequently can face more concentrated risks. He also noted that adaptations to climate change have the potential to provide opportunities for credit unions to help provide capital to communities transitioning to a low-carbon economy.

The Chairperson asked Chairman Harper about creating awareness of climate-related financial risks in the credit union system. Chairman Harper noted that many credit unions are small and may not have significant resources to devote to climate-related financial risk. He noted that the NCUA is charged with protecting the credit union system against all material risk, and he said that the NCUA could seek opportunities in the exam process to consider climate-related financial risk, including updating examination guidelines and training examiners. As an example, he said that the NCUA's experience working with credit unions in the Asheville area helped the agency better understand the importance of communicating with credit unions about disaster response planning.

The Chairperson asked Chairman Harper about cybersecurity. Chairman Harper noted the high cybersecurity risks faced by credit unions, which he said can be compounded by cybersecurity risks to credit unions' vendors.

The Chairperson asked Chairman Harper about what questions the CFRAC should consider for future work. Chairman Harper said that the CFRAC should consider the role of the federal government in helping homeowners and the financial system manage the costs from climate risks.

##### 5. Presentation on the Financial Stability Climate Risk Drivers Project

The Chairperson turned to Wendy Cromwell, Vice Chair and Head of Sustainable Investment at Wellington Management; Ivan Frishberg, Senior Vice President and Chief Sustainability Officer at Amalgamated Bank; Ed Kearns, Chief Science Officer at First Street; and Emily Grover-Kopec, Director of Climate Impacts at Rhodium Group, to present a proposed charge for the CFRAC to crowdsource analysis of financial stability climate risk drivers.

Mr. Frishberg said that the presenters wanted to propose a project for the CFRAC to develop a registry of climate risk drivers that would help contribute to further development of a risk monitoring tool by the Council's staff-level Climate-related Financial Risk Committee.

Ms. Cromwell said that the project would benefit from the CFRAC members' diverse backgrounds and networks to create a more holistic view of how physical and transition risk could impact the financial system. She said that two prior CFRAC charge presentations provided initial inputs into this proposed project, including the first CFRAC charge presentation that laid out a framework for how physical and transition risks could cluster and affect the

financial system as well as a subsequent charge presentation that looked at the impacts of different climate events to conduct reverse stress analyses.

Mr. Frishberg said that the proposed project would use a survey process to crowdsource information and inputs on financial stability climate risk drivers. He said that the presenters had wanted to accumulate discrete responses that would be used for heatmapping and further analysis. He said that they had put together a draft timeline as well as draft survey fields, which would map a harm (e.g., heat, flooding, etc.) to a risk transmission channel to an indicator or metric that could be used to monitor the risk. He said that the survey would then ask to link the transmission channel to an economic outcome or vulnerability (e.g., inflation, asset devaluation, etc.) and describe whether the risk was chronic or acute and the potential probability and severity of the risk.

Mr. Kearns said that the presenters were trying to identify all possible financial stability climate risk drivers for the project and consequently were seeking a diversity of opinions of viewpoints. Ms. Grover-Kopec said that the responses from the survey would help to clarify the links between the climate risk and the effect on the financial system and macroeconomy, and vice versa.

Following the presentation, participants discussed the CFRAC voting process under its public charter; the potential value of identifying additional risk channels; the proposed use for the responses; whether the survey will consider potential positive consequences from climate risk drivers; potential updates to the survey over time; whether the survey could capture interconnections between risks and potential compounding effects; and whether the results from the survey would be published.

#### 6. Introduction of Small Group Discussions on Forward-Looking Metrics

Ms. Hildner introduced the small group discussions on forward-looking metrics. She said that the discussions should focus on the presentation of forward-looking metrics rather than on specific metrics. She divided attendees into five groups for a discussion on presenting forward-looking metrics.

#### 7. Resolution Approving the Financial Stability Climate Risk Drivers Project

The Chairperson then presented to the CFRAC the following resolution approving the proposed charge to crowdsource analysis of financial stability climate risk drivers:

*WHEREAS, in accordance with the charter (Charter) of the Climate-related Financial Risk Advisory Committee (CFRAC), the CFRAC may determine, by majority vote, to undertake any tasks within the scope of its duties; and*

*WHEREAS, on November 15, 2024, members of the CFRAC presented an initial proposal for a charge to crowdsource analysis of financial stability climate risk drivers to gather and analyze information on climate-related risks to the financial system and discussed options to further strengthen the proposal.*



*NOW, THEREFORE, BE IT RESOLVED, that the CFRAC hereby approves to further develop and then undertake the charge to crowdsource analysis of financial stability climate risk drivers.*

The Chairperson asked for a motion to approve the resolution, which was made and seconded. The CFRAC approved the resolution with 18 members voting in favor of the resolution, none opposed, and Catherine Ansell abstaining from the vote.

#### 8. Small Group Discussions on Forward-Looking Metrics

Ms. Hildner divided attendees into five groups for a discussion on presenting forward-looking metrics.

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

James Stock said that Group 1 noted that while forward-looking metrics are helpful, it would be useful to start with current risk exposures. He said the group discussed the development of a typology of risk metrics based on the purpose of the risk metric, the level of risk, and the nature of the risk (e.g., physical vs. transition risk; known vs. unknown risk, etc.). He said that such a typology would help determine the appropriate level of aggregation and forward-looking time horizon to consider. He said that the group discussed the difference between uncertainty and probability, and the importance of not confusing the two.

Janine Guillot said that Group 2 discussed the usefulness of emissions as a starting point for measuring transition risk, how climate risks will affect the metrics regulators currently monitor, and the appropriate level to aggregate metrics for transition risks. She said that Group 2 discussed the importance of sector-level analysis to understand the effects of climate-related transition and then evaluate the impact of the transition on equity prices and banks' balance sheets. She said that Group 2 noted the importance of using a range of metrics as well as being transparent about assumptions for forward-looking metrics and using plain language to give the audience for the metrics more confidence in the metrics.

Ilmi Granoff said that Group 3 discussed the importance of considering the set of problems the audience cares about addressing and using language and metrics that are familiar to them when presenting forward-looking metrics. He said that Group 3 discussed the importance of providing clear and specific descriptions of the metrics; distinctions between metrics that are sufficient for decision making as compared to metrics that suggest additional monitoring or analysis is warranted; the usefulness of communicating uncertainty about potentially material risks; considerations in communicating the average probability of forward-looking models versus the tail; and the usefulness of presenting metrics that a decision-maker can act on versus metrics that are relevant but not actionable.

Nina Chen said that Group 4 discussed the variations in time horizons that might be useful for different stakeholders (e.g., investors may be more interested in a shorter time horizon) and the

importance of considering who is holding the risk, rather than just the level of risk. She said that Group 4 discussed the importance of a longer time horizon for forward-looking metrics for endowments, pensions, and insurance companies for assessing customer retention. She said that Group 4 discussed the importance of using visuals to provide transparency on the assumptions and uncertainties associated with forward-looking metrics, as well as the importance of considering the gap between the audience's perception of risk versus the real risk.

Wendy Cromwell said that Group 5 discussed the importance of considering the intended audience of the forward-looking metrics, including the audience's time frame. She said that Group 5 discussed the potential value of focusing forward-looking metrics on physical risk initially; the usefulness of maps as a visual that resonates with different audiences; and resources that the group participants had found useful in conveying forward-looking metrics to a broad audience. She said that Group 5 discussed the lack of precision of the climate value-at-risk variable, which investors find useful because it is a singular metric that allows comparisons across portfolios.

During the discussion following the readout, participants discussed the potential usefulness of climate risk appetites to manage risk response given future uncertainties; the insurance industry's responses to changes in climate risk; insurance companies' climate disclosures; climate risk management versus a climate risk strategy; potential for climate change to amplify stresses in the financial system versus direct effects of climate risk on the financial system; and which hazards are likely to increase risk in the future.

#### 9. Discussion of Potential Charges for the Next Meeting

The Chairperson turned to Mr. Litterman to introduce a discussion on potential charges. CFRAC members discussed options to develop a synthesis of learning from the past two years of CFRAC meetings; additional work on forward-looking metrics; and lessons learned from the Hurricanes Helene and Milton.

Following the discussion, the Chairperson offered closing remarks.

The meeting adjourned at approximately 3:30 P.M.