

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

July 18, 2023

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

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

Catherine Ansell, Executive Director of Climate Risk, JP Morgan Chase

Ed Kearns, Chief Data 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

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

Peter Wilcoxon, Ajello Professor of Energy and Environmental Policy, 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

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

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

Ilmi Granoff, Senior Fellow and Adjunct Research Scholar, Columbia Law School Sabin Center  
for Climate Change Law

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

Janine Guillot, Board Member, B Lab Global

Julie Renderos, Executive Vice President and Chief Financial Officer, Suncoast Credit Union

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

Michael Panfil, Senior Director and Lead Counsel, Environmental Defense Fund

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

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

CFRAC Observer

Allen Fawcett, Chief of Climate Economics, Environmental Protection Agency

GUESTS:

Treasury

Nellie Liang, Under Secretary for Domestic Finance

Didem Nisanci, Chief of Staff

Catherine Berg, Deputy Director and Senior Policy Advisor on Climate, Office of International  
Financial Markets

Wilson Ervin, Senior Counselor, Office of Domestic Finance

Sean Hoskins, Director of Policy, Office of the Financial Stability Oversight Council

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

Sini Matikainen, Senior Policy Advisor, Office of the Financial Stability Oversight Council

Dennis Lee, Deputy Director of Operations, Office of the Financial Stability Oversight Council

Colin Fooks, Management and Program Analyst, Office of the Financial Stability Oversight  
Council

Henry Perillo, Policy Analyst, Office of the Financial Stability Oversight Council

Joshua Zajdel, Special Assistant for Policy, Office of the Financial Stability Oversight  
Council

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

Michael Kiley, Deputy Director for Financial Stability

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)

Susan Baker, Chief of Policy Analysis, Division of Complex Institution Supervision and  
Resolution

Drew Carayiannis, Policy & Risk Analytics Chief, Division of Risk Management Supervision

Jonathan Pogach, Senior Economic Researcher, Division of Insurance Research

John Lammle, Resolution Policy Analyst

Securities and Exchange Commission (SEC)

Mika Morse, Climate Policy Counsel

Commodity Futures Trading Commission (CFTC)

Diana Dietrich, Assistant General Counsel

Consumer Financial Protection Bureau (CFPB)

Eva Nagypal, Senior Economist

Federal Housing Finance Agency (FHFA)

Dan Coates, Deputy Director, Division of Research and Statistics

Varun Joshi, Assistant Project Coordinator, Climate Change and ESG Working Group  
Jessica Shui, Supervisory Economist, Division of Research and Statistics

Comptroller of the Currency (OCC)

Timothy Stumhofer, Director of Climate Risk  
Yue (Nina) Chen, Chief Climate Risk Officer  
Joanne Phillips, Counsel

Office of the Independent Member with Insurance Expertise

Diane Fraser, Senior Policy Advisor

Federal Reserve Bank of New York (FRBNY)

Nico Becka, Principal, Global Markets and Investments  
Dina Maher, Vice President  
Lee Seltzer, Financial Research Economist, Financial Intermediation Policy Research Division

Office of Financial Research (OFR)

Steven Bright, Senior Financial Analyst  
Ashley Kent, Senior Product Manager for Data Products  
Qiana Brown, Management and Program Analyst  
Adrienne Read, Management and Program Analyst

Federal Insurance Office (FIO)

Elizabeth Brown, Senior Insurance Regulatory Policy Analyst

New York State Department of Financial Services (NYDFS)

Catherine Doll, Assistant Counsel

National Association of Insurance Commissioners (NAIC)

Jennifer Gardner, Data Coordination and Statistical Analysis Manager

North American Securities Administrators Association (NASAA)

Vincente Martinez, General Counsel

PRESENTERS:

*Presentation on First Charge Questions: What climate-related financial risk drivers are most likely to result in a systemic stability concern? What should be prioritized for monitoring for potential financial stability risks considering CFRC responsibilities?*

- James Stock, Vice Provost for Climate and Sustainability, Harvard University
- Wendy Cromwell, Vice Chair and Head of Sustainable Investment, Wellington Management
- Emily Grover-Kopec, Director, Energy and Climate Practice, Rhodium Group

*Presentation on Second Charge Questions: How does climate-related financial risk compound traditional sources of financial risk? How would you measure and monitor both acute and chronic physical risks as a financial risk amplifier?*

- Viral Acharya, C.V. Starr Professor of Economics, New York University Stern School of Business, Department of Finance
- Catherine Ansell, Executive Director of Climate Risk, JP Morgan Chase

*Presentation on Third Charge Question: What scenario narratives, data characteristics, statistical methods, and/or modeling strategies would be well-suited for transition and physical risk scenario development and analysis?*

- William Pizer, Vice President for Research and Policy Engagement, Resources for the Future
- Allen Fawcett, Chief of Climate Economics, Environmental Protection Agency
- Noah Kaufman, Research Scholar, Columbia University School of International and Public Affairs, Center on Global Energy Policy

## 1. Welcome and Opening Remarks

Sandra Lee, Chairperson of the CFRAC, called the meeting to order at approximately 12:00 P.M. The committee convened by videoconference.

The Chairperson began by describing the ongoing work of the Council's staff-level Climate-related Financial Risk Committee (CFRC) to address data gaps and identify priority data needs for member agencies. She discussed progress in collaboration with the OFR on its Joint Analysis Data Environment (JADE), which is intended to advance agencies' collective understanding of scenario analysis and develop metrics for climate-related financial risk assessment. She said that in the meeting, CFRAC members would present on the first round of charges introduced in the initial meeting of the CFRAC on March 7, 2023.

The Chairperson then introduced Nellie Liang, Under Secretary for Domestic Finance at Treasury. Under Secretary Liang began by highlighting that the number of climate disasters and their costs have increased dramatically in recent years. She noted that according to the National Oceanic and Atmospheric Administration (NOAA), since 1980 the United States has experienced 357 weather or climate disasters where overall damages or costs had reached or exceeded \$1 billion, averaging approximately eight such disasters per year. She said that in the previous three years alone, there had been a total of 60 such events, an average of 20 per year, which she noted is two and a half times greater than the long-term average. She further noted that so far in 2023, 12 confirmed billion-dollar disaster events had already occurred.

Under Secretary Liang said that increasing climate risks had contributed to recent decisions by several insurance providers to cease coverage for entire categories of new policies, including home insurance, across large areas of the country. She highlighted developments in states like

California, Florida, and Louisiana, where the risks of climate-related disasters as well as gaps in insurance coverage are increasing.

Under Secretary Liang stated that Council members and the CFRAC are particularly interested in understanding how the effects of climate change could increase financial stability risks. She noted that in the Council's 2021 climate report, the Council concluded that climate change is an emerging threat to the financial stability of the United States. She said that while the Council's broad approach to identifying risks to financial stability is well-suited for integrating climate risks, there are significant analytical challenges to doing so, including the complexity of transmission channels that link physical and transition risks to economic activity and to the financial sector.

Under Secretary Liang noted that as part of its work on financial stability, the Council seeks to ensure that the financial system is resilient to shocks or conditions that could impair its ability to support economic activity. She stated that adverse shocks could arise from within the financial system or from external sources, and that such shocks can be amplified by vulnerabilities in the financial system. She said that these shocks can also impact the system as a whole because of interconnections and spillovers among firms and activities, leading to system-wide disruptions in the provision of financial services.

Under Secretary Liang stated that when analyzing financial stability risks, it is important that experts in climate science, economics, and financial analysis be involved at each step. She said that the Council seeks to understand the links among climate risks, economic sectors, the macroeconomy, and specific financial risks. She noted that both acute and chronic physical risks have the potential to lead to sharp changes in the values of certain assets and liabilities, which can impact economic activity and the financial sector. She stated that changes in the behavior of businesses and households and in government policies, along with other transition effects, could increase financial risks when such transitions are delayed or occur in an unexpected or abrupt manner.

Under Secretary Liang said that while incorporating risks from climate-related shocks is a relatively new exercise for financial regulators, these shocks are likely to affect financial institutions and market infrastructure through familiar risk channels, such as credit risk, market risk, and operational risk. She said that these risks have long been the focus of prudential supervision and regulation by Council members. She stated that gathering adequate data is vital to measuring the effects of climate-related physical and transition risks on traditional risk channels, and she noted the importance of implementing more robust disclosures so that lenders and investors can more effectively assess the risks.

Under Secretary Liang stated the usefulness of evaluating the effects of climate risk on financial institutions and markets through the lens of traditional financial. She said that while safety and soundness of financial firms are necessary conditions for financial stability, any assessment of financial stability should also consider the broader financial system. She stated that a system-

wide approach involves combining individual firm and market risk assessments by considering interconnections and spillovers, which may magnify the effects on individual firms.

Under Secretary Liang said that a system-wide approach may also highlight possible trade-offs. She noted, for example, that the actions individual firms take to protect themselves may lead to unexpected losses at other firms or hinder objectives related to low- and moderate-income community development. She noted that these possible tradeoffs illustrate the importance of working to understand the transmission channels through which climate risk affects the financial system.

Under Secretary Liang stated that scenario analysis represents a useful approach for understanding the impact of climate-related financial risk on the financial system as a whole. She discussed the development of scenario analysis, and noted that it has been used more extensively by other countries. She also noted that it is an approach recommended in the Council's 2021 climate report. She asked the CFRAC to continue to examine how interconnections and spillovers could play out; how scenarios could be used to model the complex inter-relationships between climate risk and financial stability; and whether other methods could be used to complement scenario analysis in developing the Council's understanding of transmission channels.

Under Secretary Liang concluded by stating that a stable and robust financial system has the potential to help mitigate climate-related physical and transition risks. She noted the critical role that insurance and capital markets play in helping businesses and communities prepare for and recover from climate-related disasters. She said that better information and corporate disclosures are key to effective financial markets and institutions.

## 2. First Charge Presentation and Discussion

The Chairperson turned to Robert Litterman, Founder of Kepos Capital and Presiding Member of the CFRAC, to introduce the presenters for the first charge questions: What climate-related financial risk drivers are most likely to result in a systemic stability concern? What should be prioritized for monitoring for potential financial stability risks considering CFRC responsibilities? Mr. Litterman called on James Stock, Vice Provost for Climate and Sustainability at Harvard University; Wendy Cromwell, Vice Chair and Head of Sustainable Investment at Wellington Management; and Emily Grover-Kopec, Director of the Energy and Climate Practice at Rhodium Group, to begin their presentation.

Mr. Stock said that the presentation would provide a conceptual framework for how climate risks could affect financial system risk. He said that the presenters would first describe how climate change and the energy transition could contribute to instability in the financial system and the implications for monitoring climate-related financial risk. He said that by mapping the various physical and transition risks from climate change, the presenters were seeking to develop a framework for how these risks can individually and collectively undermine the financial system.

Mr. Stock noted some key terms used in the presentation, such as physical and transition risks, vulnerabilities, and shocks. He said that the presenters took a broad view of transition risks, which he said encompass geopolitical risks associated with the clean energy transition. He then discussed various potential scenarios. He said that the first scenario contemplated that an extreme weather event could strike an area with inadequate grid-level battery storage, which in turn could impair regional businesses' abilities to pay bank loans. He said that if business disruptions are prolonged, this could have cascading impacts on banking system stability. He discussed a scenario in which a repeal of tax credits incentivizing large investments in clean energy could lead to write-downs and could increase financial system vulnerability to other future climate and non-climate shocks.

Mr. Stock said that a framework to evaluate climate threats should consider shocks that are large enough to threaten systemic stability; shocks that are small but correlated and may contribute to a large aggregate impact or intensify because of existing amplifiers in the financial system; and climate-related conditions or events that exacerbate the vulnerability of the financial system to shocks. He said that there are large gaps in our understanding of systemic climate risks, and both qualitative and quantitative research would be useful to fill these gaps. Noting that most climate shocks by themselves are unlikely to generate systemic risks, he said that research should focus on climate impacts with the highest potential for creating systemic risk or that present heightened vulnerabilities when climate shocks cluster or combine.

Ms. Grover-Kopec then discussed the climate risk landscape. She said that researchers should focus on areas of "clustered risk," which she defined as sources of risk that may be highly correlated or flow through the financial system and economy through similar pathways to create financial stability concerns. She stated that the main goal of the presentation was to generate discussion on a framework for evaluating clustered risk rather than present a comprehensive, definitive answer on the risk drivers most likely to cause systemic stability concerns.

Ms. Grover-Kopec described the physical risk portion of the framework. She discussed physical risks themselves, such as rising sea levels; the degree of certainty associated with physical risks; and the extent to which human activities, such as forestry management practices, could impact the occurrence of physical risks.

Ms. Cromwell said that the framework took a broad view of transition risks, which she said include geopolitical, business transition, and policy-driven sources of risks. She said that potential risks posed by policy decisions can arise from a misalignment of policy-driven demand and limited transitional business supply. She stated that geopolitical threats like climate migration and de-globalization could compound climate-related financial risks, since the consequences would likely affect global markets as well as the ability of businesses to fulfil certain climate commitments.

Ms. Cromwell said that increased physical and transition risks, including risks to the power grid, stresses to supply chains, inflation, an increasing export share of oil and gas, and credit risks, could negatively impact macroeconomic activity. She said that a physical risk like extreme heat could affect power grids and impair the macroeconomic activity that depends on that energy source. She highlighted the connection between corporate carbon disclosures and the potential impacts upon equity valuation.

Ms. Grover-Kopec described three key qualitative clusters of climate risks. First, she noted that a significant portion of the overall risk flow derives from physical risks and geopolitical transition risks that impact macroeconomic activity. Second, she noted that policy-driven transition risks have a consistent impact on equity valuation. Third, she said that property valuations are exposed to a wide variety of both physical and transition risks.

Ms. Grover-Kopec stated that a cluster of common factors may combine to exacerbate the impact of a source of climate risk on the financial system. She described factors that contributed to several large insurers exiting the California property insurance market, such as higher reinsurance costs; inflation, which increases the cost of rebuilding after a loss; and state-level regulation that limits the pace at which insurers can increase their rates.

Ms. Cromwell then provided several international examples from the transition risk portion of the framework. She said that property markets in the United Kingdom and Germany represent a key risk pathway, given the potential for changing property standards to destabilize the mortgage and property markets. She said that in Germany, rent control had led to a return on investment on forced residential conversions below the cost of capital, and in the United Kingdom, only 15 percent of commercial buildings comply with new leasing standards, which in turn impacts property values. She stated that the conversion rates for both markets are complicated by rising costs associated with higher interest rates. She said that the proportion of oil and gas as a percentage of total U.S. exports and the proportion of energy transition equipment (such as solar cells and wind sets) as a percentage of total U.S. imports are both increasing. She said that acceleration in the energy transition could translate into a rapid decline in such exports, leading to a potentially unfavorable market reaction, inducing pressure on the U.S. dollar. She said in conclusion that such a scenario could increase the potential for systemic risk.

During the discussion following the first charge presentation, participants asked clarifying questions about the framework and discussed ways in which it could be expanded in the future. Participants discussed how the proposed framework would evaluate several conditions, including: private sector revenue decreases due to public sector investment in low-carbon technology; wealth effects from changes in asset values due to climate change or government responses to climate change; and the increasing reliance on insurers of last resort, such as the California Fair Access to Insurance Requirements Plan. Participants noted the importance of including links to credit risk in the framework. Participants also discussed the value of reverse stress testing to determine which risk clusters in the framework present high levels of risk to the financial sector.



#### 4. Second Charge Presentation and Discussion

The Chairperson turned to Mr. Litterman to introduce the presenters for the second charge questions: How does climate-related financial risk compound traditional sources of financial risk? How would you measure and monitor both acute and chronic physical risks as a financial risk amplifier? Mr. Litterman called on Viral Acharya, C.V. Starr Professor of Economics at New York University Stern School of Business's Department of Finance, and Catherine Ansell, Executive Director of Climate Risk at JP Morgan Chase, to begin their presentation.

Mr. Acharya said his portion of the presentation would reference several case studies to demonstrate how climate risk interacts with weak economic conditions, as well as the different effects of acute and chronic physical risks.

Mr. Acharya discussed the first case study, which he noted incorporated several datasets, including the Spatial Hazard Events and Losses Database for the United States (SHELDUS); NOAA disaster data; economic performance data developed by the National Bureau of Economic Research addressing employment, house prices, and recessions; and aid data from the period 1995-2020. He discussed the difference in risks associated with acute and chronic physical climate stressors. He said that acute stressors are harder to predict, and he noted that risks are directly correlated to the increased severity of the acute stress, such as extreme weather events. He said that chronic stressors refer to the sustained long-term shifts in climate patterns and can cause much more damage over time. He said that his study defined an event as "acute" if associated damage was in the upper 90<sup>th</sup> percentile and event duration was in the lowest 10<sup>th</sup> percentile.

Mr. Acharya described the findings of the first case study, which examined the differences in economic outcomes for areas that experienced acute physical climate stressors compared to chronic physical climate stressors. He noted that his study found that areas that experience acute climate stressors experienced employment growth for certain sectors (e.g., reconstruction services) immediately after the acute stress event. He said that his study found that areas that suffered from chronic physical climate stressors experienced more negative impacts on employment and house prices, particularly if there was an ongoing recession, as compared to areas that experienced only acute climate stressors. He noted that it is difficult to analyze the impact of government aid, which could mitigate the economic effects of acute climate stressors. He said it is unclear how much of the difference in the effects from acute and chronic physical stressors is due to government aid, because such aid is less available for areas experiencing chronic climate stressors. He noted that because government aid varies from state to state, it is necessary to examine aid decisions of the Federal Emergency Management Agency at a more granular level. He said that more research needs to be done to understand how aid affects acute and chronic risks scenarios.

Mr. Acharya described the next study, which examines mitigation efforts for acute and chronic heat risk over 12 years (2009-2020) using heat data from the SHELDUS database. He said his study examined two sets of counties, one of which experienced chronic heat stress and one of which did not. He said his study then examined companies operating in both sets of counties to determine if there was evidence of companies making efforts to shift resources and business away from counties that have been affected by chronic heat risk and toward counties that have not been affected by such risk. He noted that his study found that counties that experienced heat stress saw decreases in the number of establishments, employment, and household income growth. Conversely, he said the study found that counties that did not experience heat stress saw instances of growth. He then noted that his study also compared outcomes between small and large firms. He said his study found that small firms in counties that experienced heat stress lost employment to large firms, potentially because larger firms are better able to manage shocks.

Ms. Ansell discussed approaches and considerations for how banks perceive the complexity of climate risk. She discussed how climate risks can be a driver of traditional risk types, such as strategic, credit, market, and operational risk. She said that considerations include how much risk of loss a firm is willing or able to accept, whether physical or transition risks are predominant, what transmission channels are relevant, and whether these transmission channels compound previously identified risks.

Ms. Ansell noted that transition risks can stem from shifts in consumer preferences and technological changes. She said that physical risks can lead to supply chain disruptions that decrease profitability and can affect commodity prices. She described a case study on homeowners' property insurance. She noted that property insurance supports stability in the mortgage market by reducing the idiosyncratic financial impact to consumers associated with damage from severe weather events, including those driven by or exacerbated by increasing physical climate risk. She identified two channels through which changes in insurance coverage and pricing could impact banks by driving credit losses. First, she stated that insurance coverage gaps, whereby consumers are not purchasing adequate coverage for disaster events, could result in consumers being unable to repair their home following a disaster event, which can lead to a lower loan-to-value (LTV) ratio and subsequent increased credit risk. Second, she stated that sharp increases in the cost of insurance decrease affordability, particularly for borrowers with higher debt-to-income ratios. She noted that both coverage gaps and rate increases can result in credit risk increases.

Ms. Ansell said that if insurance companies cannot increase insurance premiums to reflect the cost of increased risk then it may no longer be cost-effective for insurers to offer those products to consumers. She said that this problem is particularly acute when another part of the financial system requires consumers to have insurance, for example in connection with the purchase of a home. She noted that when private insurance companies withdraw, state governments may step in to provide insurance. She said that even if state governments subsidize the cost of premiums, consumers may still effectively pay for the higher risk through increased taxes. She stated that any time market pricing is disconnected from the true cost of a risk, policymakers may want to

monitor this disconnect, as well as the insurance coverage gap and debt-to-income ratios. Finally, she noted the relationship between insurance and reinsurance as a consideration in understanding insurance market developments.

During the discussion, participants asked clarifying questions about the impact of foreclosures. Participants discussed the usefulness of modeling individual and clustered disaster scenarios for understanding risk, and also discussed limitations in the ability of models developed by the Network for Greening the Financial System (NGFS) to model multiple shocks. Participants also discussed the importance of accurate land valuation and the lack of studies seeking to understand if there are differences in land valuations, or the frequency of new mortgages, among low- and moderate-income homeowners as compared to higher-income homeowners following disaster events.

## 6. Third Charge Presentation and Discussion

The Chairperson turned to Mr. Litterman to introduce the presenters for the third charge question: What scenario narratives, data characteristics, statistical methods, and/or modeling strategies would be well-suited for transition and physical risk scenario development and analysis? Mr. Litterman called on William Pizer, Vice President for Research and Policy Engagement at Resources for the Future; Allen Fawcett, Chief of Climate Economics at the Environmental Protection Agency; and Noah Kaufman, Research Scholar at the Columbia University School of International and Public Affairs' Center on Global Energy Policy, for the presentation.

Mr. Fawcett said that transition risk analysis captures several outputs, including preference changes, technological changes, policy changes, and expectation changes. He said that outputs associated with these risks include price changes associated with the cost of energy prices, shifts in economic activity, regional changes in areas suffering chronic and frequent acute disasters, skill gaps in the workforce, risks for government spending (including the crowding out of collective investment and elevated debt levels), capacity additions to fully implement the Inflation Reduction Act, trade tensions, competitiveness, carbon border adjustments, policy and regulatory uncertainty, and political polarization.

Mr. Fawcett said that transition risks vary for different stakeholders. He noted that workers are typically concerned about job and unemployment shifts; households about energy costs and other expenses; firms about changing consumer preferences; financial institutions about their balance sheets; governments about fiscal exposure; and central banks about financial stability. He stated that throughout the financial sector, individual and firm-wide transition risk vulnerabilities generally depend on policy choices, technological capabilities, and private behavior. He said that should a systemic financial risk arise, it can undermine confidence in financial institutions and markets, which may compound or trigger inflation or a recession.

Mr. Kaufman described the recent scenario analysis exercise undertaken by the Federal Reserve. He said that the goal of this exercise was to learn about large banking organizations' climate risk-management practices and challenges. He said that the exercise is focused on transition risks, which he noted are based on NGFS scenarios. He then described opportunities to improve the exercise, by capturing more of the potential desired outputs of a transition risk analysis described in the beginning of the presentation by Mr. Fawcett. He also said that in his view, the Federal Reserve exercise relied on an outdated policy pathway that incorporates carbon prices. He said that the White House report *Selecting Climate Information to use in Climate Risk and Impact Assessments* presented a viable alternative to carbon prices. He explained that this report details, with domestic and international geographical granularity, quantitative approaches for incorporating climate transition risks into real-world policy approaches.

Mr. Pizer said that the consequences associated with delayed action on transition risks may have widespread effects. He noted several examples, including the rapid pace of economic changes; the occurrence of unexpected events (including technology breakthroughs and shifts in consumer sentiment); and high transition costs, which collectively or individually could result in significant dislocation of jobs and business activity, failure of financial institutions, financial market volatility, or a recession.

During the discussion, participants discussed use cases for NGFS models compared to other models with higher sector-level or risk-category granularity. Participants also discussed the importance and role of consumer education in the mitigation of physical and transition risks as well as how to account for energy system replacements and the associated geopolitical risks when developing scenarios.

## 8. Group Discussions on Climate-related Risks and Insurance

Kaitlin Hildner, Senior Policy Advisor in the Office of the Financial Stability Oversight Council at Treasury, then divided attendees into four separate groups for a discussion regarding climate-related risks and insurance. The first group consisted of (1) CFRAC members Ms. Grover-Kopec, Ivan Frishberg, Ms. Ansell and CFRAC observer Mr. Fawcett; (2) CFRC members Adele Morris, Diane Fraser, Adrienne Read, and Elizabeth Brown; and (3) Henry Perillo, Policy Analyst in the Office of the Financial Stability Oversight Council at Treasury. The second group consisted of (1) CFRAC members Tracey Lewis, Julie Renderos, and Ms. Cromwell; (2) CFRC members Nina Chen, Morgan Lewis, Timothy Stumhofer, John Lammle, Joanne Phillips, and Wilson Ervin; and (3) Sini Matikainen, Senior Policy Advisor in the Office of the Financial Stability Oversight Council at Treasury. The third group consisted of (1) CFRAC members Mr. Stock, Janine Guillot, Laura Bakkensen, Mr. Litterman, and Mr. Pizer; (2) CFRC members Susan Baker and Steven Bright; and (3) Sean Hoskins, Director of Policy in the Office of the Financial Stability Oversight Council at Treasury. The fourth group consisted of (1) CFRAC members Ilmi Granoff, Peter Wilcoxon, Michael Panfil, and Ed Kearns; (2) CFRC members Jessica Shui and Caroline Norris; and (3) Gordon McDonald, Senior Policy Advisor in the Office of the Financial Stability Oversight Council at Treasury, and Ms. Hildner.

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

Ms. Ansell said that Group 1 noted that decisions on insurance policy are primarily political decisions. She discussed the likelihood that future physical risks will disproportionately affect low- and moderate-income Americans, who may not be able to afford higher insurance premiums. She noted that the group discussed the disconnect between how insurance and reinsurance are currently priced. She said that consumers will ultimately bear the costs of policy decisions that limit firms' ability to price in climate change risks when those firms no longer write coverage in certain geographical regions.

Ms. Lewis said that Group 2 discussed the need to develop a broad framework that regulators can use to mitigate cost increases associated with reinsurance and physical risks impacting consumers and investors. She said that environmental justice considerations should be factored into any policy decisions.

Ms. Guillot said that Group 3 discussed the economic implications of changes to insurance coverage, given that mortgage and property markets are contingent upon reasonably priced insurance. She said that insurance coverage is not an issue only for the handful of states that have recently seen insurance coverage gaps, but is a nationwide concern. She stated that the group discussed whether coverage gaps are emerging because insurance price changes are prohibited by state policy or because risks have changed to an extent that they cannot be reasonably priced; the mortgage-backed securities market, which she said raises both credit risk and liquidity risk; and equity concerns across socioeconomic status, race, and geography.

Mr. Granoff said that Group 4 discussed whether increased climate stress and solvency issues will lead insurers to retreat from high-risk areas. He noted that such a retreat can increase vulnerability to economic shocks by eroding housing prices and increasing systemic risks. He stated that the group discussed whether advocating for more affordable insurance pricing adequately addresses the problem or simply delays any meaningful action to address the underlying issues, driving up reinsurance costs and heightening physical risks.

## 9. Discussion Regarding Upcoming Set of Proposed Charges

Following the group readouts, the Chairperson turned to Mr. Litterman to introduce the upcoming set of proposed charges, which the CFRAC subsequently discussed. The proposed charges were presented as follows:

- Discuss data sources and collection methods for human factors that serve as potential physical risk mitigants, e.g., people's awareness of risks and people's desire to live in high-risk areas. How should such financial institutions consider these risk mitigants? Is there research on what resources make a difference in educating consumers about the risks?

- The timing of when the physical risk occurs might be quite disconnected from when the financial sector responds to the physical risk (“Minsky moment” concern). For example, the timing of when the financial sector might take into account wildfire risk in asset valuation might not immediately fall after a wildfire event. Discuss how you would approach understanding this disconnect.
- Distributional outcomes of risk pricing: While providing appropriate incentives, policy approaches that price climate risk into insurance, mortgage rates, or other homeowner costs may result in higher costs of living in certain neighborhoods, which could raise an issue for Community Reinvestment Act or other fair lending requirements for financial institutions. Discuss the interplay of fair lending in pricing climate risk into climate-vulnerable areas and how regulators and financial institutions could navigate these two, at times competing, priorities.
- How might a severe weather event or series of weather events lead to a housing market crash/bubble burst? Proposed scenario to explore:
  - Florida/Texas/Louisiana experiences an unusually heavy hurricane season with multiple hurricanes that cause severe damage prompting individual and institutional rapid shifts in perceptions of climate risk.
  - Florida state-backed Citizens Insurance withdraws insurance coverage from (or substantially increases pricing for/ they are unable to obtain reinsurance coverage) certain heavily populated areas of Florida that now do not have access to affordable insurance. National Flood Insurance Program increase insurance premiums and re-zones properties on the back of large-scale losses.
  - Buyers are not able to obtain insurance, and thus buyers are no longer able to obtain financing, and existing homeowners experience a significant decrease in housing value that disproportionately impacts low- and moderate-income households and vulnerable communities.
  - Communities in other areas with similar potential climate risk exposure experience a sudden drop in value as insurers increase pricing and/or buyers become more wary of purchasing homes that may experience significant changes with respect to insurance coverage.

Following the discussion, the Chairperson offered closing remarks, and discussed next steps regarding charges and scheduling details for the next meeting.

The meeting adjourned at approximately 4:50 P.M.