

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

October 20, 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, JPMorgan Chase

Cecilia Martinez, Principal Advisor for Resilience and Communities, Bezos Earth Fund (via
videoconference)

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)

Peter Wilcoxon, Ajello Professor of Energy and Environmental Policy, Syracuse University
Department of Public Administration and International Affairs (via videoconference)

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

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 (via videoconference)

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

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

Adam Wang-Levine, Deputy Assistant Secretary for Climate, Energy, and Infrastructure

Ethan Zindler, Climate Counselor to the Secretary

Matthew Aks, Senior Advisor, Climate Hub

Mary Lewis, Special Advisor, Office of the Secretary

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
Henry Perillo, Policy Analyst, Office of the Financial Stability Oversight Council
Meredith Palermo, Policy Analyst, Office of the Financial Stability Oversight Council
Jared Greufe, Policy Analyst, Office of the Financial Stability Oversight Council
Adya Mahajan, Junior Fellow, Office of the Financial Stability Oversight Council
Claire Howard, Junior Fellow, Office of the Financial Stability Oversight Council

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

Morgan Lewis, Manager, Division of Supervision and Regulation (via videoconference)
Adele Morris, Senior Advisor, Financial Stability
Caroline Norris, Financial Analyst, Financial Stability Climate Committee

Federal Deposit Insurance Corporation (FDIC)

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 Markets

Federal Housing Finance Agency (FHFA)

Sandra Thompson, Director, Federal Housing Finance Agency
Dan Coates, Deputy Director, Division of Research and Statistics
Jessica Shui, Supervisory Economist, Division of Research and Statistics

Comptroller of the Currency (OCC)

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

Office of Financial Research (OFR)

Ashley Kent, Senior Product Manager for Data Products

Federal Insurance Office (FIO)

Silab Mohanty, Senior Insurance Regulatory Policy Analyst (via videoconference)
Elizabeth Brown, Senior Insurance Regulatory Policy Analyst

PRESENTERS:

Presentation on First Charge Questions: Building off the framework presented at the July meeting, develop a set of narratives that flow from physical risk through the insurance market. Discuss the possible effects to other areas of the financial system, such as housing, and who ultimately bears the burden of these risks.

- Catherine Ansell, Executive Director of Climate Risk, JPMorgan Chase

- Laura Bakkensen, Associate Professor, University of Arizona School of Government and Public Policy
- Tracey Lewis, Policy Counsel for the Climate Program, Public Citizen

Panel Discussion on Risk Indicators for Climate-Related Financial Risk

- Moderator: Nina Chen, Chief Climate Risk Officer
- Panelists:
 - Ed Kearns, Chief Data Officer, First Street Foundation
 - Ilmi Granoff, Senior Fellow and Adjunct Research Scholar, Columbia Law School Sabin Center for Climate Change Law
 - Wendy Cromwell, Vice Chair and Head of Sustainable Investment, Wellington Management

Presentation on Second Charge Questions: 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 equity concerns as well as issues for fair lending requirements for financial institutions. Discuss the interplay of equity/fair lending in pricing climate risk into climate-vulnerable areas and how regulators and financial institutions could navigate these two, at times competing, priorities.

- Karen Diver, Senior Advisor to the President for Native American Affairs, University of Minnesota
- Ivan Frishberg, Senior Vice President and Chief Sustainability Officer, Amalgamated Bank
- Julie Renderos, Executive Vice President and Chief Financial Officer, Suncoast Credit Union

1. Welcome and Opening Remarks

Sandra Lee, Chairperson of the CFRAC, called the meeting to order at approximately 9:00 A.M.

The Chairperson began by welcoming everyone to the meeting and thanking the CFRAC members who presented on the three charge presentations at the July CFRAC meeting. She then described the agenda for the day, including opening remarks from Sandra Thompson, Director of the FHFA, the two charge presentations, and the panel on risk indicators moderated by Nina Chen, the Chief Climate Risk Officer at the OCC.

The Chairperson then described recent work of the Council’s staff-level Climate-related Financial Risk Committee (CFRC), including the recently released Climate-related Financial Risk: 2023 Staff Progress Report. She said that the CFRC continued to serve as a forum for interagency information sharing, coordination, and capacity-building on climate-related financial risks. She said that Council member agency staff on the CFRC’s Risk Assessment Working Group had started to identify a preliminary set of risk indicators for banking, insurance, and financial markets. She said that these indicators, along with the framework that the CFRC was also developing, would deepen agency staff’s understanding of climate-related financial risks. She also noted that the OFR had launched a new platform, the Joint Analysis Data Environment

(JADE), to integrate and analyze a broad spectrum of financial and other relevant data, including climate-related risks.

The Chairperson then introduced Director Thompson. Director Thompson began by stating that climate change poses a significant threat to the safety and soundness of the financial system, especially the housing finance sector. She noted that the number of climate disasters where overall damages or costs had reached or exceeded \$1 billion had increased in recent years and that a significant portion of those costs arose from destruction of property, including homes, which is the most significant asset for most households. She noted the destruction following recent hurricanes, which have damaged or destroyed many thousands of homes. She then described the consequences of such property destruction, including household displacement and the effects on property insurance.

Director Thompson said that home insurance is the primary safety net for homeowners and is critical for both borrowers and mortgage guarantors. She said that increasing risk and damage from climate change was causing some insurers to pull out of certain areas and that rising reinsurance rates were making it difficult for insurers to keep insurance affordable. She said that this was of particular concern to the FHFA and its regulated entities, which are concentrated in residential collateral. She said that the consequences of these trends could include increasing mortgage defaults and prepayments, a higher level of risk among borrowers, and increasing volatility of house prices. She said that the impacts could vary widely across the country and could affect low-income households more than affluent ones. She noted that Fannie Mae and Freddie Mac require property and casualty insurance for each loan they purchase. She said that high insurance costs could make it difficult for first-time home buyers to obtain insurance and could increase monthly housing costs for current homeowners if mortgage servicers must force place new, more expensive insurance policies when existing policies were not renewed.

Director Thompson said that the FHFA cannot solve these challenges without partners. She said that this highlighted the importance of the CFRAC, which she said can help bridge critical data gaps and provide important advice. She concluded with an announcement of the FHFA's first Symposium on the Availability and Affordability of Single-Family Property Insurance on November 14 and 15.

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: *Building off the framework presented at the July meeting, develop a set of narratives that flow from physical risk through the insurance market. Discuss the possible effects to other areas of the financial system, such as housing, and who ultimately bears the burden of these risks.* Mr. Litterman called on Catherine Ansell, Executive Director of Climate Risk at JPMorgan Chase; Laura Bakkensen, Associate Professor at University of Arizona's School of Government and Public Policy; and Tracey Lewis, Policy Counsel for the Climate Program at Public Citizen, to begin their presentation.

Ms. Ansell said that several factors were impacting property and casualty (P&C) insurance, some of which were associated with climate change and others were associated with market dynamics. She referenced a study that found that over the past five years, insured losses had averaged \$100 billion compared to an average of less than \$50 billion over the prior five-year period. She said that the study found that five factors contributed to the rising costs in the past five years, the first of which was inflation, because increasing prices make it more expensive to rebuild a home. She said that the second factor was natural variability in the selection of any single five-year period. She said that climate change would impact the future likelihood of an increasing number of storms, but that the absolute number of storms would retain a degree of variability and volatility. She then referenced another study that found that climate change had driven an 11 percent increase in insured losses.

Ms. Ansell noted that for some banks, insurers were important both as a source of collateral and as investments. She said that investors in insurance companies may have been more concerned about insolvency compared to consumers, who she said were more concerned about unavailability and unaffordability. She said that insurers acted like asset managers and much of the profits made by insurance companies derived from net investment gains rather than gains from underwriting. She noted that because of this, insurance companies' net income had been positive since 2013, despite two years of underwriting losses from large hurricanes. She referenced a study that found that only 24 cents per dollar of homeowners insurance premium is associated with catastrophe loss. She also discussed the evolution of the insurance market in Florida, which she noted significantly changed after the arrival of Hurricane Andrew in 1982 led to the insolvency of 11 insurance companies.

Ms. Ansell said that policies that prevent insurers from pricing in expected increases in climate-related property damage had influenced the decision of insurers withdrawing from certain markets and state governments stepping in to assume larger shares of the market. She said that anticipated policy changes would allow for more risk-reflective pricing, which she said would result in premium rate increases for some homeowners. She said that the National Flood Insurance Program (NFIP) was an example of this shift, as Risk Rating 2.0 phased in risk-reflective pricing, with the goal that taxpayers and those with lower risk should not subsidize those taking on higher risk. She said that a question remained regarding who should bear the higher costs of insurance due to climate change, because even those who live in high climate risk areas may not have contributed disproportionately to climate change and may not have known about the climate risk when they chose to live there.

Ms. Ansell concluded her portion of the presentation by asking what could be learned from past insurance market failures due to mispricing and what mechanisms are available to signal climate risk to home buyers and to incentivize homeowners to invest in adaptation to improve climate resilience.

Ms. Bakkensen said that the insurance market is quite diversified and multifaceted, noting the existence of both private and public markets and that general P&C insurance and specific hazard insurance is available. She said that the private market had not experienced large-scale volatility, even though some smaller insurers had become insolvent. She said that climate change would lead to physical risk stressors and create additional complexity because past events may not

describe the full distribution of losses in the future. She referenced a study that found that the U.S. hurricane loss distribution had a thick right tail, which she said made forecasting future losses from historical data more difficult. She said that climate change could interact with other market conditions, such as a recession, to create additional complexity. She also said that climate change was leading private insurance companies to increasingly rely on forward-looking climate models, but she noted that these models could potentially underestimate the risk. She also referenced a study that found cross-subsidization and heterogeneous pricing in insurance premiums, suggesting insurance costs may not have always reflected risk.

Ms. Bakkensen said that insurers referenced the price of reinsurance as a factor in price increases and limited availability. She also said that there was considerable heterogeneity in insurance market regulation across the fifty states. She said decisions by both state regulators and the federal government could lead to taxpayers absorbing insurance costs in some cases. She said that adaptation could help reduce the challenges caused by climate change. She said that mitigating activities should be incorporated into insurance pricing to incentivize homeowners, but she said that this could be difficult to achieve when such activities are hard to monitor.

Ms. Bakkensen noted that there had been historical increases in the number of policies issued by state-run insurance markets. She noted increased attention on transitioning those policies to the private market, and she referenced ongoing work in Louisiana. She said that despite the higher prices associated with state-run policies in some cases, a sizable shift back to the private market had not occurred, which she said could be due to the perceived credibility of private insurers. She said that it was important to understand who would pay for the long-term fiscal imbalance in the market, as it varies across U.S. states. She said that while reinsurance sometimes pays, it is an expensive solution. She also said that there was uncertainty over the role of the federal government in the event of a failure of a state-run insurance market.

Ms. Bakkensen said there were concerns about the market completeness of the NFIP. She noted that although flood insurance is mandatory for homeowners with federally regulated mortgages in high-risk zones, the coverage is limited to \$250,000, which she said may not be sufficient. She discussed criticism of the Federal Emergency Management Agency's (FEMA's) flood maps and the definition of "high-risk" FEMA used for the NFIP. She said that insurance take-up had been low outside of areas with mandatory coverage, even though 40 percent of claims came from outside of the high-risk zone. She said that it was important to consider who would ultimately bear the costs of the underinsured or the uninsured, such as the homeowner, banks, or government-sponsored enterprises. She stated that her and other research showed that banks that wrote the loans most at risk due to climate change in some cases transitioned that risk to the government-sponsored enterprises.

Ms. Lewis said that reduced access to homeowner and property insurance is a threat to financial stability. She said that 39 million properties are at high risk of natural disasters, and she said that this risk had not yet been reflected in homeowners' insurance premiums. She said that 12 million properties had significant flood risk outside of the FEMA flood zones. She said that there were 4.4 million properties in zip codes with high wildfire risk. She said that insurance premiums were rising and would continue to rise in these areas.

Ms. Lewis said that the expansion of the state-run Citizens Insurance Agency to become the largest insurer in Florida, as well as the growth in policy non-renewals and increase in state-run Fair Access to Insurance Requirements (FAIR) plans in California, were examples of sub-systemic risk in the market. She said that this sub-systemic risk presented a number of consequences for consumers, including cancellation of policies, market withdrawals, and premium spikes.

Ms. Lewis said that the risk would flow to consumers once insurers started withdrawing from the market. She said that because most homeowners rely on wage income to meet financial needs, premium increases would eventually become unaffordable. She said that once consumer capacity had been exceeded, the risk would flow to banks and municipalities, and ultimately to taxpayers.

Ms. Lewis said that the loss of access to insurance has serious implications for racial inequality, and she noted previous impacts to low- and moderate-income areas where Black and Latino homeowners reside.

Ms. Lewis said that Treasury Secretary Janet Yellen was right to warn about the potential serious impacts of insurance on home values and the financial system, with potentially devastating consequences. She said that while these trends had not directly caused systemic failures in the past, historical data was becoming increasingly irrelevant in predicting future trends. She said that advocacy groups were discussing potential policy responses to insurance failures, including public reinsurance, disaster relief, climate resilience measures, and managed retreat. She said that community planning is important and suggested proposals for Community Development Block Grant Disaster Recovery reform to better respond to climate risks. She said that the Federal Reserve has options to reduce risks in this space. She said that it is important to address growing climate change-related economic inequality as a source of systemic risk. She said that insurance companies should reevaluate fossil fuel funding.

During the discussion following the first charge presentation, participants discussed whether climate change may result in financial stability impacts that manifest not as shocks, but rather as a series of gradual changes that destabilize key sectors of the financial system, such as insurance. Participants also discussed the difficulty of isolating the impact of climate change on insurance from other factors that might be impacted by climate change, such as inflation. Participants also discussed the inequalities related to managed retreat; the potential for smaller climate events to generate significant costs for insurance companies; whether increases in climate risk should be borne by those who have the highest climate risk or should be treated like a tax that is cross-subsidized from lower-risk areas or taxpayers more broadly; whether it would be useful to create an omnibus property insurance product that covers all natural hazards; the potential for litigation risk if consumers are not told of known climate risk; and the potential for more informed policy decisions if consumers are educated on how climate risks affects their insurance premiums.

3. Panel on Climate-Related Financial Risk Indicators

The Chairperson introduced Nina Chen, Chief Climate Risk Officer at the OCC, as the moderator for a panel on climate-related financial risk indicators. The panel consisted of Ed Kearns, Chief Data Officer at First Street Foundation; Ilmi Granoff, Senior Fellow and Adjunct

Research Scholar at Columbia Law School Sabin Center for Climate Change Law; and Wendy Cromwell, Vice Chair and Head of Sustainable Investment at Wellington Management. Ms. Chen first asked Ms. Cromwell about the data she analyzes when building portfolios and how robust the data needs to be to reach decisions regarding climate-related financial risk. Ms. Cromwell said that low carbon transition is a major transformation, for which companies need to develop a strategy, and that physical risk is occurring within the maturity date of some investments. She stressed the importance of regulatory disclosure, including the SEC's proposed climate disclosure rule. She said that she recommended collecting scope 1, scope 2, and material scope 3 emissions data from companies, with a safe harbor for scope 3. She said that her company had asked for locations where companies had material operations, which could then be mapped to physical climate risks. She said that it was important to understand scope 3 emissions, but she noted a divergence of opinions in this area. She said that data providers already provide estimated values for scope 3, and some market participants were already using that data. She noted that the data would likely be more accurate if companies started to report it themselves. She said that scope 3 was sometimes criticized as double counting, but she said this was less relevant for asset managers for whom the primary use case is analyzing the risks and opportunities facing issuers with different business models and supply chain structures.

Ms. Chen then asked Mr. Granoff to describe which high-level climate-related transition risk indicators he would want to monitor if he was a financial regulator. Mr. Granoff said the data show that clean energy had grown substantially in the last two decades. He said that although the rate of transition is unknown, it had been supercharged by government investments. He offered the example of battery capacity, noting that the United States had 44 gigawatt-hours in battery capacity in 2021, but announced capacity by 2030 had increased to 1 terawatt-hour by November 2022. He said that transition risk was primarily manifesting as substitution risk, but he noted that this was not how financial companies model transition risk. He said that this substitution risk could be detected through the value of assets in high-carbon firms declining due to revenue erosion, not new costs or liabilities. He said that while this revenue erosion was unlikely to lead to a financial stability crisis, it could create both micro- and macroprudential risks. He said that microprudential risks could result from eroding credit quality and market risk. He said that macroprudential risks could be created from vulnerabilities with systemic implications in combination with other shocks. He said that regulators should focus on capital plans and whether financed entities have realistic assumptions about cash flows in the context of the transition and the impact of this on financial institutions. He said exposures to high-carbon sectors unweighted against loans represented a useful tool to the location of exposures and potential erosion of assets, as well as opportunities.

Ms. Chen said that it was important to discuss the speed of transition, because the downstream effects were important to consider. She noted that car manufacturing was often considered to have high transition risk, but she said that car part manufacturers were not frequently discussed. Ms. Cromwell said that understanding emissions profiles was important not just for understanding emissions, but also for understanding transition readiness. She said that such information was not widely available and could lead to mispricing and increased volatility over time as investors reconcile estimated emissions with event-driven news.

Ms. Chen then asked Mr. Kearns to describe the physical risk profile of a bank or insurance company. Mr. Kearns said that physical risk is well-defined, and the industry should now focus on understanding the erosion of asset value. He said that the industry currently relies on catastrophe models, which he said were not built for modeling medium- or high-frequency events. He said that insurance typically does not address medium- and high-frequency events, which he said should instead be the focus of community resilience efforts. He said that the effects of climate change were already evident in shifts in heavy rainfall, and he referenced two one-in-100-year rainfall events in Brooklyn in the past six months. He said that greater attention should be paid to infrastructure and its ability to withstand increases in the number and severity of climate events. He said that research indicated that individuals were beginning to move away from areas with high-frequency, low-cost events. He said that migration led to trickle-down effects, because migration patterns impact real estate values, which impact banks. He said that it was difficult for banks to accurately measure these metrics.

Ms. Chen asked how firms should evaluate their tolerance for incomplete or uncertain data regarding climate-related financial risks and whether their tolerance should be different depending on what the data are used for. Ms. Cromwell said that regulatory standards should address this issue. She said that banks could ask for this data from clients when making a loan, and regulators should ask for the data as well. She said that while banks typically use historical data when making loans, they use forward-looking models in other segments of their business. She said that there is a prevalent view in the insurance market that greater guidance on what risks to focus on and what level of risk warrants deeper analysis is needed. She said that insurance companies have the option to reprice and renew every year, therefore insurance companies may not price in risks that may occur more than a year in the future. Mr. Kearns said that the variability of climate models over the next 20 to 30 years is quite small, and that creating ensembles of models and methods reduces uncertainty. He said that some natural hazards, such as drought, are difficult to model. He said that economic models are not as accurate as physical risk models at present, and he noted that current analysis focuses more on how risks interact with and build upon each other.

Ms. Chen asked the panelists about situations in which financial institutions used the wrong indicator. Mr. Granoff said that using inferred temperature over a decade or more does not capture short-term risk or divergent policy pathways and is therefore not the best way to capture transition risk. He also said there was a risk of overreliance on emissions footprints alone as a tool for understanding transition risk. He said that companies had a longer history of sustainability reporting as a marketing tool for corporate social responsibility branding, but he noted that the tools developed for measuring sustainability for branding, while useful, were limited when applied to measuring risk. Ms. Cromwell cited several examples of financial institutions using the wrong indicator, including not using forward-looking analytics (e.g., assuming static carbon footprints over time); not using scope 3 in investment decision-making; using the wrong measurement of financed emissions for the purpose (e.g., it is better to use a measurement of emissions per millions of dollars invested for portfolio decision-making rather than absolute financed emissions which is more appropriate for contribution purposes); not considering physical risk in management decision-making; and insurers not considering the climate risks of their asset portfolios. Mr. Kearns said that some financial institutions do not use

sufficiently granular data given the significant differences that could appear within counties, zip codes, and even census tracts.

During the discussion that followed the panel, participants discussed the importance of knowing where assets are physically located in the world; having regular discussions about the rate of change of transition risk; and understanding risks in the supply chain. Participants also discussed which indicators regulators should monitor to understand the costs to the financial system and economy; the importance of monitoring insurance market retreats; better measurements for modeling substitution effects from transition risk; the potential for using cluster analysis to evaluate systemic risks; the point at which infrastructure designed to protect communities from natural disasters breaks; the downsides of assuming constant carbon prices in modeling; and the interplays between climate risk and credit worthiness.

4. Second Charge Presentation and Discussion

The Chairperson turned to Mr. Litterman to introduce the presenters for the second charge questions: *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 equity concerns as well as issues for fair lending requirements for financial institutions.* Discuss the interplay of equity/fair lending in pricing climate risk into climate-vulnerable areas and how regulators and financial institutions could navigate these two, at times competing, priorities. Mr. Litterman called on Karen Diver, Senior Advisor to the President for Native American Affairs at the University of Minnesota; Ivan Frishberg, Senior Vice President and Chief Sustainability Officer at Amalgamated Bank; and Julie Renderos, Executive Vice President and Chief Financial Officer at Suncoast Credit Union, to begin their presentation.

Ms. Renderos said the presenters first considered different scenarios that could impact consumers, such as a scenario where there is a large and immediate increase in insurance premiums, which could lead in turn to Fannie Mae and Freddie Mac ceasing securitization of mortgages in high climate risk areas, which could ultimately lead to changes in consumer choices. She said that in her experience as a Florida resident, state residents generally rebuild after a disaster. She said that over time, this could lead to decreases in property values and increases in defaults. She said it could also lead to uncoordinated and unplanned migration out of high-risk areas and into lower-risk areas that were not prepared for the population influx. She said that these consequences hurt consumers and ultimately damage financial institutions.

Ms. Renderos discussed other scenarios, including one in which a gradual increase in insurance costs occurred, and both the government and mortgage market incentivize risk reduction, leading to lower insurance claims. She said this scenario would result in a slower decline in property prices. She said that this would be the preferred scenario from a policy perspective, but that such a scenario would become more and more difficult to attain over time. She said that climate issues were already affecting the United States and that greater action was needed to avoid a market crash.

Mr. Frishberg said that the equity impact of climate change was clear and demonstrated that those with less equity and fewer resources were at greater risk. He said that there was a severe underpricing of climate risk, and he noted that models do not accurately price in the risk, because they only use inputs that they can measure and have excluded some of the most significant known risks predicted by the scientific community. He said that outcomes predicting minimal impact on portfolios from a rapidly warming world did not seem credible, especially when compared to the costs of recent natural disasters. He said that these models were assessing the risk to individual assets, which he said failed to effectively measure and address systemic risk. He said that it was important to consider who would ultimately bear these costs.

Mr. Frishberg noted that wealth accumulation in the United States is built to a large extent on homeownership. He said that Americans frequently believe that homeownership provides for inter-generational wealth building, but he said that climate change and climate migration could imperil this wealth building. He said that it was most imperiled for vulnerable communities that could least afford the costs of climate change. He said that it was therefore important to put housing at the center of conversations around climate-related financial risk and equity.

Ms. Diver said that prioritizing financial risk does not consider all the impacts to communities. She said that individuals with higher incomes moving into high climate-risk areas were making housing more unaffordable there, displacing local residents. She said that increasingly, only those who could afford the higher prices would be able to preserve their wealth. She also said that managed retreat could raise problems as a tool for climate risk mitigation, because not everyone is capable of or willing to move. She said that residents often have important ties to their communities and want to remain near their social supports.

Ms. Diver said that one of the problems with community planning for climate resilience is that there is no requirement for inter-jurisdictional cooperation. She said that this problem is exacerbated by the way climate data is provided. She said that most data were provided at a zip-code level, but she said that this presented a disconnect from how jurisdictions made decisions for effective disaster planning. She said that it would be useful to provide data on a watershed level. She said that a whole-of-government approach was needed. She said that decisions in one jurisdiction may have consequences for other jurisdictions, and she said that it is important to manage the displacement of risk from one community to the next. She said that policies should consider whether they view certain people or certain land as disposable, which she said that she had seen from an indigenous community perspective.

Mr. Frishberg said that migration into communities with lower climate risk may not have the infrastructure to support that migration.

Ms. Renderos said that a map of community bank headquarters showed that small banks were concentrated in high climate-risk areas. She said that it would be important to consider the role of small financial institutions in helping communities thrive and serving underserved populations. She said that small financial institutions were often not able to adequately address climate risk and often lacked the federal support necessary to do so.

Mr. Frishberg said that pressure was growing for financial regulation and the market to solve climate-related risks. He said that the current Administration's actions to date were not adequate, which he said increased the likelihood of having to start again at the end of this term. He said that financial markets are not going to solve this problem, nor would public-private partnerships, even though private sector companies were willing to partner with the public sector. He said that financial regulators alone also cannot solve the problem. He said that economic policy changes would be needed and that financial institutions should consider how they could put pressure on decision-makers to avoid the worst-case scenario.

Ms. Diver said that in her experience as president of the Fond du Lac reservation, communicating changes in risk potential with communities through direct, expert-led conversations can be effective risk mitigation tools. She said that in focusing on financial institutions, it was possible to leave out useful ways to mitigate climate risk. She said that an example of this was engaging citizens on water management on the Fond du Lac reservation. She said it was very cheap to provide gutters, and such mitigations could provide substantial climate-related financial risk benefits.

Ms. Renderos said that several solutions were available, such as subsidized insurance, which could help protect vulnerable residents from price impacts of climate change, but she said that such solutions had pros and cons. She said that the mortgage lending and insurance sectors should coordinate to protect consumers and ensure consistency with fair lending laws. She said that there are fair lending implications for pricing in climate risk, which would have a larger impact on low- and middle-income communities. She said that climate risk assessments must consider fair lending assessments. She said that other potential regulatory and policy actions include developing a regulatory framework that enables more innovation in the insurance space, such as parametric and microinsurance products, as well as increases in the subsidies for disaster insurance that consider equity-oriented principles for resilience and managed retreat.

Following the presentation, attendees discussed the accuracy of current models forecasting the economic effects of a warmer world; whether such models include gaps (e.g., compounding effects); and the potential for other tools, such as narratives, to be used to describe the potential impacts of climate change. Attendees also discussed the importance of tracking the amount of temperature rise the United States could withstand before systems break down; the importance of land access for indigenous communities; and the implications of climate-risk prone housing stock being used as investment products and the potential impact on renters and household economic well-being more broadly. Participants discussed the need for additional federal support, such as providing decision-useful climate risk data to help small financial institutions, including many community development financial institutions, to manage climate risk. Participants also discussed the creation of specific incentives to help redistribute the burden of increased prices from climate change and the cost to mitigate climate risk away from low-income or minority communities using tools similar to those used for Opportunity Zones.

5. 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:

- How would you design a scenario analysis exercise that focuses on climate-related risks in the United States and takes into consideration currently enacted policy and legislation?
- Building off the framework presented at the July CFRAC meeting, how would you design a reverse stress analysis to determine what climate-related events (physical or transition risk related) could result in a financial stability concern?
- 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 financial institutions consider these risk mitigants? Is there research on what resources make a difference in educating consumers about the risks?

Following the discussion, the Chairperson offered closing remarks.

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