Remarks of CFTC Commissioner Rostin Behnam at the 56th Crop Insurance and Reinsurance Bureau Annual Meeting, Bonita Springs, Florida

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Changing Weather Patterns: Risk Management for Certain Uncertain Change

Introduction

Good morning. I would like to thank the Crop Insurance & Reinsurance Bureau for the invitation to be here with you in Florida to discuss some issues and initiatives I am working on related to the impact of climate change on financial markets and the challenges we are collectively facing. I will begin with a brief overview of the Commodity Futures Trading Commission (the "CFTC" or "Commission"), then I will provide a little personal history of how I developed an interest in the impact of weather and climate change on risk management, and finally I will discuss a current initiative I am spearheading at the Commission. Before I begin, please allow me to remind you that the views I express today are my own and do not represent the views of the CFTC or my fellow Commissioners.

The Commission

As a quick level set, the CFTC is a bipartisan, five-member federal regulatory agency that serves as the U.S. derivatives market regulator. For decades, the CFTC has established and enforced market-based rules under the Commodity Exchange Act, which is also the enabling statute that created the Commission. Our mission is to foster open, transparent, competitive and financially sound markets; prevent and deter price manipulation and other disruptions to market integrity; and to protect all market participants and the public from fraud, manipulation, and abusive practices.[1] The CFTC accomplishes its mission through a system of effective self-regulation, direct oversight, and a strong enforcement program.

In 2010, Congress greatly expanded the CFTC's regulatory responsibility with the passage of the Dodd-Frank Wall Street Reform and Consumer Protection Act.[2] In addition to the futures and options markets, the CFTC now oversees the swaps market and various swap market participants. The vast majority of the derivatives contracts the CFTC oversees are based on underlying financial commodities, including global currencies and interest rates. However, the Commission has a deep history and commitment to supporting the entire American agricultural value chain through the oversight of futures, options, and swaps in agricultural commodities, ensuring a safe, transparent, and liquid marketplace for agricultural stakeholders to manage risk.[3]

[1] Commodity Exchange Act § 3, 7 U.S.C. § 5 (2012).
[2] Dodd-Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111-203, 124 Stat. 1376 (2010).
[3] CFTC, WHAT IS THE CFTC'S ROLE IN THE AGRICULTURAL ECONOMY?, https://www.cftc.gov/sites/default/files/2019-12/oceo_cftcrolebrochure032117.pdf.

The Committee

More personally, sandwiched between a number of professional years focused in finance and the law in the New York metropolitan area, and my current position at the CFTC, I was fortunate to serve as Senior Counsel on the Senate Committee on Agriculture, Nutrition, & Forestry for Michigan Democrat, Senator Debbie Stabenow. Those more than six years of education and experience shaped my understanding and views regarding the multitude of risks farmers and ranchers face. I was fortunate to be a part of then Chairwoman Stabenow's successful effort to lead passage of the bipartisan 2014 Farm Bill.[4] Like today, the few years leading up to the 2014 Farm Bill presented many new and evolving risks for the agricultural economy, which demanded fresh thinking of how to appropriately update and strengthen legacy risk management programs.

What was particularly unique leading up to 2014 was Senator Stabenow's focus on risks related to climate change. Weather and climate present the greatest, consistent—yet uncertain— risks to the agricultural economy and rural communities. More frequent and more severe extreme weather events, from flooding, hurricanes, and tornadoes, to wildfires have presented a growing set of longer term challenges that require a different way of assessing long-term risk management and the policies to support it. To give you some perspective, according to one report, the average number of extreme weather events per year has more than tripled since the 1980s.[5] Further, according to the National Oceanic and Atmospheric Administration (NOAA), the number of events resulting in losses exceeding $1 billion (USD) each since 1980 has more than doubled in the most recent five years (2015-2019) from an annual average of 6.5 to 13.8 events.[6]

In part, many of the climate-related disasters agricultural producers and rural communities faced leading up to 2014 helped garner support for the inclusion of a wide range of Farm Bill programs in the final law. Everything from more robust crop insurance and disaster safety net programs, to the most significant investment in working lands conservation programs that can help sequester carbon through things like cover crops, to programs that support healthy forests, renewable energy, and agricultural research—these all help farmers and rural communities become more resilient and a part of the solution. Many of these same programs were strengthened and included in the 2018 Farm Bill.[7] These policies and programs are not what most people think of as traditional climate mitigation policies; but they each are targeted, effective programs meant to support and incentivize better long term agricultural and forestry practices that tackle climate change head on.

[4] Agricultural Act of 2014, Pub. L. No. 113-79, 128 Stat. 649 (2014).
[5] Willem Buiter & Benjamin Nabarro, *Managing the Financial Risks of Climate Change*, CITI GPS 11 (Oct. 2019), https://www.citivelocity.com/citigps/managing-financial-risks-climate-change/.
[6] *U.S. Billion-Dollar Weather and Climate Disasters*, NOAA NATIONAL CENTERS FOR ENVIRONMENTAL INFORMATION (2020), https://www.ncdc.noaa.gov/billions/.
[7] Agricultural Improvement Act of 2018, Pub. L. No. 115-334, 132 Stat. 4491 (2018).

The Cause

Pivoting to the autumn 2017, I joined the CFTC and had a new mission that was laser-focused on the derivatives markets. As I mentioned, we are a Commission of five. While the Chairman oversees the administrative functions of the Commission—such as supervising Commission personnel and directing their work agenda to fulfil the Commission's larger policy agenda[8]—each commissioner sponsors an advisory committee. The CFTC's advisory committees were created to provide input and make recommendations to the Commission on regulatory and market issues. The committees are tremendous Commission assets in that they convene the exchanges, market participants, market service providers, end users, academia, and public interest groups, and provide policy recommendations to the full Commission for consideration. Since 2017, I have sponsored the Market Risk Advisory Committee or "MRAC."

The MRAC advises the Commission on matters relating to evolving market structures and movement of risk across the derivatives markets. It examines systemic issues that threaten the stability of the derivatives and other financial markets. The MRAC is comprised of 37 member-representatives from clearinghouses, exchanges, intermediaries, market participants, academia, and regulators.

The MRAC and its objectives—set out in a charter[9]—helped focus me as I considered what I wanted to achieve during my term. During those first few months, I took a step back from speechmaking, and focused on partaking in dozens of meetings and conversations all across the country in an effort to formulate the goals and ideals that would guide and anchor me for the next few years. I wanted to make sure my goals and ideals were grounded in the real-world concerns and challenges facing market participants. It was during these months that I started to connect the dots between climate change and financial market risk, and what role policy makers should and could play to mitigate these more extreme, emerging risks, specifically with respect to financial market participants.

While my lens is naturally focused on U.S. markets, at the same time I was threading the needle on why climate change ought to be brought to the forefront of our policy agenda, by mid-2017, the Bank of England (BOE), under Governor Mark Carney's leadership, had successfully pushed this issue to the front of its agenda.[10] By the end of 2017, eight central banks and supervisors convened the Network for Greening the Financial System (NGFS).[11] Even earlier, in December of 2015, the Financial Stability Board (FSB) established the Task Force on Climate-related Financial Disclosures (TCFD) to focus on the development of voluntary, consistent company

[8] Commodity Exchange Act § 2(a)(2)(A), 2(a)(6), 7 U.S.C. § 2(a)(2)(A), 2(a)(6) (2012).
[9] *See,* U.S. COMMODITY FUTURES TRADING COMM'N, *Renewal Charter of the Market Risk Advisory Committee* (May 9, 2018), https://www.cftc.gov/About/CFTCCommittees/MarketRiskAdvisoryCommittee/index.htm.
[10] *See,* Matthew Scott, Julia van Huizan, and Carsten Jung, *The Bank of England's response to climate change, Quarterly Bulletin, 2017 Q2*, BANK OF ENGLAND 98 (June 16, 2017), https://www.bankofengland.co.uk/quarterly-bulletin/2017/q2/the-banks-response-to-climate-change.
[11] *Origin and Purpose*, NETWORK FOR GREENING FIN. SYS. (last updated Sep. 13, 2019, 2:47 PM), https://www.ngfs.net/en/about-us/governance/origin-and-purpose.

disclosures to help financial market participants understand their climate-related risks.[12] Private financial institutions were beginning to publicize what they perceived as climate related financial market risk and how to address it.[13] Additionally, I was certainly cognizant of the critical role climate has naturally (and obviously) played within insurance and reinsurance markets for decades, and appreciate much of the work that has been done recently to support more open dialogues about the risks climate change poses to the insurance industry and its users.

The Current Initiative

It took a few years to get those dots aligned enough to bring them to the attention of the MRAC. As sponsor, I develop the MRAC's agenda through collaboration with the MRAC members as well as input from the public**.** I am proud to say that since 2017, the MRAC has convened to address a variety of matters, including the impending transition away from the London Interbank Offered Rate, more commonly known as Libor.[14] Also, the MRAC has held discussions on market structure issues, clearinghouse risk issues, and even crypto asset markets — I am talking about Bitcoin.

But, last June, I got to combine my experience in the Senate—specifically those early deliberations regarding climate change—with my professional experience in financial markets, and my current role as a financial market regulator. The MRAC held a public meeting on the relationship between climate change and financial market risk.[15] In my biased view, the meeting was a great success. However, it was always my intention that the public meeting would be the first step in building a more comprehensive, longer term initiative that is now well under way.

In November 2019, following full Commission approval, I formed a subcommittee within the MRAC, the Climate Related Financial Market Risk Subcommittee (the "Subcommittee"). Chaired by Bob Litterman,[16] founding partner and Risk Committee Chairman of Kepos Capital, the Subcommittee includes 35 experts from financial markets, the banking and insurance sectors, as well as the agricultural and energy markets, data and intelligence service providers, the environmental and sustainability public interest sector, and academic disciplines singularly focused on climate change, adaptation, public policy, and finance. [17] Each member has demonstrated expertise in one or more disciplines in which they have devoted significant time

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[12] Press Release, Financial Stability Board, FSB to establish Task Force on Climate-related Financial Disclosures (Dec. 4, 2015), https://www.fsb-tcfd.org/wp-content/uploads/2016/01/12-4-2015-Climate-change-task-force-press-release.pdf .

[13] *See, e.g.*, The Investor's Guide to Climate Change, MORGAN STANLEY (Dec. 2015), https://www.theatlantic.com/sponsored/morgan-stanley/the-investors-guide-to-climate-chante/696/.

[14] *See* Rostin Behnam, Commissioner, CFTC, Remarks of Commissioner Rostin Behnam at the ISDA/SIFMA AMG Benchmark Strategies Forum, New York, New York (Feb. 12, 2020), https://www.cftc.gov/PressRoom/SpeechesTestimony/opabehnam14.

[15] Information on all of the MRAC meetings, including press releases, archived webcasts, and presentation materials are available at https://www.cftc.gov/About/CFTCCommittees/MarketRiskAdvisoryCommittee/mrac_meetings.html.

[16] *e.g.*, Bob Litterman, *The Very High Costs of Climate Risk*, N.Y. TIMES (Dec. 11, 2019), https://www.cftc.gov/media/3181/MRAC_Litterman121119/download.

[17] *See* Press Release Number 8079-19, CFTC, CFTC Commissioner Rostin Behnam Announces Members of the Market Risk Advisory Committee's New Climate-Related Market Risk Subcommittee (Nov. 14, 2019), https://www.cftc.gov/PressRoom/PressReleases/8079-19.

and consideration to the challenges presented by the risks of climate change. Again, in my biased view, the Subcommittee includes some of the sharpest minds on climate related financial market risk and represents a first-of-a kind U.S.-based comprehensive, inclusive effort to study and address the issues. The Subcommittee Chairman has committed to providing a report containing policy recommendations by June of this year.

The Certain Uncertainty

As I crafted the charge and mandate of the Subcommittee last summer, I thought about economic and financial market climate risks very basically, and subsequently stacked hypotheticals and different scenarios on top of each other. Unfortunately, the planet has experienced more severe and frequent extreme weather events which have affected our communities and their economies. In 2019, there were 820 global natural disaster events causing overall losses of $150 billion (USD).[18] Of those events, 38% were storms; 45% were floods, flash floods and landslides; and 10% were heatwaves, cold spells, and wildfires.[19] According to NOAA, 2019 was the fifth consecutive year (2015-2019) in which 10 or more billion-dollar weather and climate disaster events impacted the United States.[20] In fact, we broke another record last year: July 2018-June 2019 marked the wettest 12 months this country experienced since records began 125 years ago. I'll repeat that: July 2018-June 2019 marked the wettest 12 months in this country's recorded history.[21]

The International Monetary Fund (IMF) is adding climate-related factors into its existing stress-testing methodology to help government and private-sector leaders prepare for potential financial shocks triggered by climate change. According to a paper it released last week, global weather-related insured losses increased to $138 billion (USD) in 2017.[22] To provide some perspective, such losses had increased from about $10 billion (USD) in the 1980s to about $50 billion (USD) in the last decade.

Focusing on U.S. agricultural commodities, according to a USDA report, agricultural producers reported they were *not* able to plant crops on more than 19.4 million acres in 2019.[23] This marked the most prevented plant acres reported since USDA's Farm Service Agency (FSA) began releasing the report in 2007, and 17.49 million acres more than reported at that time in the

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[18] Petra Löw, *Natural Catastrophes in 2019*, MUNICH RE: NATCATSERVICE (Jan. 2020), https://www.munichre.com/content/dam/munichre/global/content-pieces/documents/media-relations/Factsheet-natural-disasters-2019.pdf/_jcr_content/renditions/original./Factsheet-natural-disasters-2019.pdf.

[19] Petra Löw, Ernst Rauch, and Mark Bove, *Tropical Cyclones Cause Highest Losses: Natural Disasters of 2019 in Figures*, MUNICH REINSURANCE COMPANY (Jan. 9, 2020), https://www.munichre.com/topics-online/en/climate-change-and-natural-disasters/natural-disasters/natural-disasters-of-2019-in-figures-tropical-cyclones-cause-highest-losses.html.

[20] *See* NOAA, *supra* note 6.

[21] *U.S. has its wettest 12 months on record – again*, NOAA (July 9, 2019), https://www.noaa.gov/news/us-has-its-wettest-12-months-on-record-again.

[22] Tobias Adrian, James Morsink, and Liliana B. Schumacher, *Stress Testing at the IMF, Department Paper No. 20/04*, IMF: MONETARY AND CAPITAL MKTS. 45 (2020), https://www.imf.org/en/Publications/Departmental-Papers-Policy-Papers/Issues/2020/01/31/Stress-Testing-at-the-IMF-48825.

[23] Press Release, United States Department of Agriculture, Farm Service Agency, Report: Farmers Prevented from Planting Crops on More than 19 Million Acres (Aug. 12, 2019), https://www.fsa.usda.gov/news-room/news-releases/2019/report-farmers-prevented-from-planting-crops-on-more-than-19-million-acres.

previous year. Of those acres, more than 73% were in 12 Midwestern states, where the heavy rainfall and flooding prevented many producers from planting core commodities like corn, soybeans and wheat.[24] Flood-related federal crop insurance payouts for the 2019 growing season were reported as totaling more than $6.4 billion (USD) so far—the costliest on record.[25]

Grain storage, livestock, ethanol, processing plants, and rail were all negatively affected by what the New York Times has called "The Great Flood of 2019."[26] Cash markets were impacted because there were fewer bids from grain elevators and processors. In May, the CME Group, our market's largest agricultural commodity exchange, declared a Force Majeure with respect to corn and soybean shipping stations due to flooding on the Illinois and Mississippi Rivers.[27] While the market resolves itself over time, the fabric of the market changes. American farmers are under more stress than during the 1980s farm crisis, going out of business with farm debt rising about 4% in 2019 to $427 million (USD) and with farm debt-to-income at the highest level since 1984.[28] U.S. farm bankruptcies were up 20% in 2019—an eight-year high.[29]

The devastating wildfires in California, which among other things, resulted in PG&E, California's largest utility, becoming the first "corporate casualty of climate change" when it filed for bankruptcy, citing an estimated $30 billion in liabilities and 750 lawsuits from the wildfires.[30] This is just one example of a new reality that needs to be addressed. And this is not to discount the devastation from the wildfires in Australia more recently. These are all manifestations of the physical risks associated with changing climate and extreme weather events. Damage to property, infrastructure, and land makes it unusable for a period of time — if not permanently—and these are only the more direct effects. Secondary, indirect, and risk feedback loops further manifest through lower or lost asset value and increased default risk on mortgages and loans due to a number of factors, including some very harsh realities in terms of job loss and forced migration.

From a financial markets perspective, how do these physical risks manifest in credit markets and lending relationships between counterparties on a local, regional, or even national level? We are

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[24] *Id.*

[25] Ryan McCrimmon, *Crop insurance payouts hit record $6.4B in 2019*, POLITICO: MORNING AGRICULTURE (Feb. 4, 2020 10:00 AM), https://www.politico.com/newsletters/morning-agriculture/2020/02/04/the-trade-aid-train-keeps-chugging-785021.

[26] Sarah Almukhtar, Blacki Migliozzi, John Schwartz and Josh Williams, *The Great Flood of 2019: A Complete Picture of a Slow-Motion Disaster*, N.Y. TIMES (Sept. 11, 2019), https://www.nytimes.com/interactive/2019/09/11/us/midwest-flooding.html .

[27] *See* SER-8380, CME Group, Declaration of Condition of Force Majeure at Corn and Soybean Shipping Stations Due to Flooding on the Illinois and Mississippi Rivers and Load-Out Impossibility (May 2, 2019), https://www.cmegroup.com/notices/market-regulation/2019/05/SER-8380.html#pageNumber=1.

[28] Isis Almeida, *Crazy Midwest Weather Spurs Hardest Year Ever for U.S. Farms*, BLOOMBERG (Aug. 28, 2019), https://www.bloomberg.com/news/articles/2019-08-28/crazy-midwest-weather-spurs-hardest-year-ever-for-u-s-farmers.

[29] John Newton, *The Verdict Is In: Farm Bankruptcies Up in 2019*, AM. FARM BUREAU FED'N (Jan. 29, 2020), https://www.fb.org/market-intel/the-verdict-is-in-farm-bankruptcies-up-in-2019; *see also,* P.J. Huffstutter, *U.S. farm bankruptcies hit an eight-year high: court data*, REUTERS (Jan. 30, 2020), https://www.reuters.com/article/us-usa-farms-bankruptcy/us-farm-bankruptcies-hit-an-eight-year-high-court-data-idUSKBN1ZT2YE.

[30] Russell Gold, *PG&E: The First Climate-Change Bankruptcy, Probably Not the Last*, WALL ST. J. (Jan. 18, 2019), https://www.wsj.com/articles/pg-e-wildfires-and-the-first-climate-change-bankruptcy-11547820006.

facing increasing financial risks as a result of potential bank loan losses due to business interruptions and bankruptcies caused by extreme weather events. These losses have a compounding effect as extreme weather events—especially for the uninsured—can impact both the creditworthiness of the borrowers and the value of the loan collateral, translating to higher probability of default and higher losses in the event of a default.[31] As noted by Lael Brainard, Member of the Board of Governors of the Federal Reserve System, feedback loops could also develop between the effects on the real economy and those on the financial markets.[32] If property prices fail to reflect climate related risks, a sudden correction could result in losses to financial institutions, which could in turn reduce lending in the economy, leading to further knock-on effects.

And there are the transition risks associated with adjustments to a low-carbon economy, such as losses in the value of assets or corporations that depend on fossil fuels. And given the lessons from the 2008 financial crisis, specifically the interconnectedness of global financial markets, this begs the question of how, if at all, do local and regional market disruptions resulting from extreme climate events affect market resiliency and stability in an increasingly concentrated banking system?

Climate change is a risk management challenge that presents uncertain and potentially severe consequences over time. It manifests as multiple intersecting and uncertain future hazards, acting as a risk multiplier with other stressors that create new risks and alter existing ones.[33] According to the Fourth National Climate Assessment, global average temperature increased by about 1.8°F from 1901 to 2016, and the evidence does not support any credible natural explanations for this amount of warming; rather the evidence points to human activities in the form of emissions of greenhouse gases, as the dominant cause.[34] According to NOAA, 2019 was the second-hottest year in its 140-year climate record, just behind 2016.[35] Indeed, the world's five warmest years have all occurred since 2015, with nine of the 10 warmest years occurring since 2005.[36] Sea level rise threatens significant damage to property, not only homes and businesses, but public assets and infrastructure, adding significant contingent liabilities to taxpayers. In the U.S., a study found that between 2005 and 2017, sea level rise wiped $14.1

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[31] *See Transition in thinking: The impact of climate change on the UK banking sector*, BANK OF ENGLAND, PRUDENTIAL REGULATION AUTHORITY 7-8 (Sept. 2018), https://www.bankofengland.co.uk/-/media/boe/files/prudential-regulation/report/transition-in-thinking-the-impact-of-climate-change-on-the-uk-banking-sector.pdf.

[32] Lael Brainard, Member, Board of Governors of the Federal Reserve Board, Why Climate Change Matters for Monetary Policy and Financial Stability (Nov. 8, 2019), https://www.federalreserve.gov/newsevents/speech/files/brainard20191108a.pdf.

[33] C.P. Weaver, et al., *Reframing climate change assessments around risk: recommendations for the National Climate Assessment*, 2017 ENVTL. RES. LETTER 12 080201 (2017), https://iopscience.iop.org/article/10.1088/1748-9326/aa7494/pdf.

[34] Sarah Doherty et. al, *Our Changing Climate*, *in* FOURTH NATIONAL CLIMATE ASSESSMENT, VOLUME II 74, 76 (Linda O. Mearns ed., 2019), https://nca2018.globalchange.gov/chapter/2/.

[35] 2019 was 2nd Hottest Year on Record for Earth Say NOAA, NASA, NOAA (Jan. 15, 2020), https://www.noaa.gov/news/2019-was-2nd-hottest-year-on-record-for-earth-say-noaa-nasa.

[36] *Id.*

billion (USD) off of home values in coastal states from Connecticut to Florida.[37] NOAA's Office for Coastal Management predicts that if we continue on the current path, by 2050, up to $106 billion worth of coastal property will likely be below sea level.[38]

Beyond reducing or erasing home values, sea level rise displaces people and can lead to increased salinization of soil and water resources used for irrigation, especially in delta regions. Low income and marginalized communities, both in urban and rural areas, already suffer from food security issues and have lower levels of liquid saving to meet emergency expenditures. These communities will be less resilient when faced with the impacts and ripple effects of extreme weather and climate change on income, property value, and health[39]

The data suggest a likely pattern of more extreme, frequent weather, and we must prepare now by, among other things, beginning the transition to a low-carbon economy. However, we must consider the risks associated with the transition toward carbon-neutral energy sources. More specifically, as technology, policy, and consumer preferences change, how will these migrations affect asset prices of businesses not prepared for the transition? This could leave assets stranded. Wholesale portfolios such as coal mining, power generation, and oil and gas are especially exposed to transition risks. There are larger economic repercussions that could occur if the transition is not executed in a thoughtful manner, and the costs associated with both transition and physical risks depend on the trajectory chosen for reducing carbon emissions.

Insurers need to increase their focus on climate risk to investments, and they will need access to reliable data to accurately measure and manage that risk. For example, a 2016 survey of California-licensed insurers indicated that survey participants had $528 billion (USD) in fossil fuel related investments. These include investments in coal, oil and gas utilities that rely on fossil fuels to generate electricity.[40] The TCFD recommends that insurers undertake climate risk scenario analysis of investment portfolios and in November of last year, formed an advisory group to assist it in developing practical guidance on climate-related scenario analysis.[41] The BOE's April 2019 Supervisory Statement set out expectations for UK banks and insurers to develop and embed risk management practices, including conducting scenario analyses to inform strategy setting, and risk assessment, and risk identification. [42] In December, the BOE published

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[37] WORLD ECON. FORUM, THE GLOBAL RISKS REPORT 2019 57 (14th ed. 2019), http://www3.weforum.org/docs/WEF_Global_Risks_Report_2019.pdf .

[38] *Fast Facts Climate Change Predictions*, NOAA OFFICE FOR COASTAL MANAGEMENT, https://coast.noaa.gov/states/fast-facts/climate-change.html (last visited Feb. 7, 2020).

[39] *See* Brainard, *supra* note 32; *see also* Christopher W. Avery, et.al, *OverviewI*, *in* FOURTH NATIONAL CLIMATE ASSESSMENT, VOLUME II 33, 36 (Linda O. Mearns ed., 2019), https://nca2018.globalchange.gov/chapter/1/, https://nca2018.globalchange.gov/chapter/1/.

[40] INT'L ASS'N OF INS. SUPERVISORS, ISSUES PAPER ON CLIMATE CHANGE RISKS TO THE INSURANCE SECTOR 65-66 (July 2018), https://www.unepfi.org/psi/wp-content/uploads/2018/08/IAIS_SIF_-Issues-Paper-on-Climate-Change-Risks-to-the-Insurance-Sector.pdf.

[41] Press Release, TCFD, The Task Force on Climate-related Financial Disclosures Forms Advisory Group on Climate-related Scenario Guidance (Nov. 14, 2019), https://www.fsb-tcfd.org/wp-content/uploads/2019/11/Announcement-Formation-of-TCFD-Advisory-Group-on-Scenario-Guidance-FINAL-1.pdf.

[42] Supervisory Statement SS3/19, Bank of England, Enhancing banks' and insurers' approaches to managing the financial risks from climate change (Apr. 2019), https://www.bankofengland.co.uk/-/media/boe/files/prudential-regulation/supervisory-statement/2019/ss319.

a discussion paper setting out its proposed framework for the 2021 Biennial Exploratory Scenario ("BES") Exercise. The objective of this Exercise is to test the resilience of the largest banks and insurers against the physical and transition risks associated with different possible climate scenarios, as well as the financial system's broader exposure to climate risk.[43]

Critical Movement

As I mentioned early on, core policy responses to climate risk are gaining traction with many different regulatory actors—including from the BOE, the TCFD, the NGFS, as well as the UK's Financial Conduct Authority, and more recently the Federal Reserve.[44] I am further heartened that awareness, analysis and action appear to be snowballing in the private sector. In the past few months alone, we have witnessed industry leaders taking meaningful steps to begin to meet this challenge. A shared focus has been the development of a standardized taxonomy; a common language for defining activities and financial instruments so that we can measure, evaluate, and respond to risk on a level playing field. As investors, market actors, and policymakers increasingly focus allocation of capital in facilitating transition to a low-carbon economy, disclosures and reporting become a key charge. The TCFD has been very successful in moving the conversation forward regarding standardized disclosures and reporting.[45] Additionally climate risk related best practices and governance measures are critical to changing habits to better align incentives for a transitioning economy, and the BOE and European Central Bank have been key proponents. Finally, as I mentioned, scenario analysis and stress testing are critical tools to evaluating resiliency. Concerning climate, both scenario analysis and stress testing become increasingly difficult exercises because of the uncertainty of climate outcomes. How wide a lens or improbable a scenario should we consider?

Conclusion

Many critical issues remain to be tackled, and each seems to be as mired in complexity as they can be. Given the certainty that we need a plan—as of yesterday—to deal with the uncertain but real impacts of climate change on the natural, human, and financial systems, I am confident that convening the Subcommittee will lead to thoughtful, actionable and data-driven recommendations to move Commission—and perhaps larger U.S. and global financial—policy in the right direction. The Subcommittee is just one part of what needs to be a collective action. In my view, it's critical to have private sector and public sector participants, a *public-private partnership*, contributing to this evolving, but critical conversation. Further, we cannot rest

[43] News Release, Bank of England, Bank of England consults on its proposals for stress testing the financial stability implications of climate change (Dec. 18, 2019), https://www.bankofengland.co.uk/-/media/boe/files/news/2019/december/boe-consults-on-proposals-for-stress-testing-the-financial-stability-implications-of-climate-change.pdf?la=en&hash=F5793F43311398FA061D5FD41A2E668A0E9252F9.

[44] *See, e.g.*, Brainard, *supra* note 32; Glenn D. Rudebusch, FRBSF Economic Letter 2019-09, Climate Change and the Federal Reserve (Mar. 25, 2019), https://www.frbsf.org/economic-research/publications/economic-letter/2019/march/climate-change-and-federal-reserve/; News Release, FRBSF, San Francisco Fed Hosting Economics of Climate Change Research Conference (Nov. 7, 2019), https://www.frbsf.org/our-district/press/news-releases/2019/san-francisco-fed-hosting-economics-of-climate-change-research-conference/.

[45] Press Release, TCFD, Second TCFD Status Report Shows Steady Increase in TCFD Adoption (June. 5, 2019), https://www.fsb-tcfd.org/wp-content/uploads/2019/06/Press-Release-2019-TCFD-Status-Report_FINAL.pdf.

while waiting for the perfect. Action is required now, and every step – however big or small – is a positive step towards addressing these risks.

Thank you again for allowing me to share my views.