Ceres

THE CERES ACCELERATOR FOR SUSTAINABLE CAPITAL MARKETS

TURNING UP THE HEAT

The need for urgent action by US financial regulators in addressing climate risk

APRIL 2021

Photo: Bloomberg

ABOUT CERES
Ceres is a nonprofit organization working with the most influential capital market leaders to solve the world's greatest sustainability challenges. Through our powerful networks and global collaborations of investors, companies and non-profits, we drive action and inspire equitable market-based and policy solutions throughout the economy to build a just and sustainable future. For more information, visit ceres.org and follow @CeresNews.

ABOUT CERES ACCELERATOR FOR SUSTAINABLE CAPITAL MARKETS
The Ceres Accelerator for Sustainable Capital Markets is a center within Ceres that aims to transform the practices and policies that govern capital markets in order to reduce the worst financial impacts of the climate crisis. It spurs action on climate change as a systemic financial risk—driving the large-scale behavior and systems change needed to achieve a net-zero emissions economy. For more information, visit ceres.org/accelerator.

ACKNOWLEDGEMENTS

Report Author: Senior Program Director, Capital Markets Systems, Ceres **Veena Ramani**

Managing Director, Ceres Accelerator for Sustainable Capital Markets, Ceres **Steven M. Rothstein**

Chief Executive Officer and President, Ceres **Mindy Lubber**

Special thanks to report consultant **Peyton Fleming**

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Project Contributors
Ceres would like to thank the following people for contributing their valuable time and thoughtful feedback to this project and informing our recommendations. The views expressed in this report are Ceres' alone and do not necessarily reflect those of these contributors.

Nina Chen Sustainability and Climate Initiatives Director, New York Department of Financial Services
David Cotney Senior Advisor, FS Vector
Carlos Curbelo Former U.S. Congressman and Principal, Vocero LLC
Tony Davis CEO and CIO, Inherent Group, LP
Amy Friend Senior Advisor, FS Vector
Gregg Gelzinis Associate Director, Center for American Progress
Julie Gorte Senior Vice President, Sustainable Investing, Impax Asset Management
Dave Jones Director, Climate Risk Initiative, Center for Law, Energy & the Environment (CLEE), UC Berkeley School of Law
Lindsey Owens Fellow, The Roosevelt institute
Aaron Pickering Senior Vice President. Headstand
Eric Pitt Climate Finance Consultant
Barney Schauble Chair, Nephila Climate
Alicia Seiger Lecturer, Stanford Law School, Managing Director, Precourt Institute Sustainable Finance Initiative
Managing Director, Steyer-Taylor Center for Energy Policy and Finance
Troy Shaheen Communications Advisor
Josh Silver Senior Advisor, National Community Reinvestment Coalition
Nader Sobhani Climate Policy Associate, Niskanen Center
Liz Sweeney President, Nutshell Associates LLC
Michela Zonta Senior Policy Analyst, Housing Policy, Center for American Progress

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Cover Photo: Bloomberg/Samuel Corum

FOREWORD

It is with great pleasure that I write this foreword for Ceres' report **Turning up the Heat: The need for urgent action by U.S. financial regulators in addressing climate risk**. As a former Republican congressman from Florida, I have seen firsthand how climate change is an enormous threat that all Americans should be concerned about. It is a nonpartisan issue like no other.

I grew up near the Everglades and represented southern Florida, an area that is especially vulnerable to rising sea levels that are threatening drinking water supplies and triggering widespread nuisance flooding. The specter of more climate warming and higher sea levels—even just six inches, as experts at Florida Atlantic University are forecasting by 2030—is unsettling. Many parts of the state could be unlivable. The economic toll and societal upheaval are unfathomable. And low-income communities are especially vulnerable to climate impacts.

Of course, Florida is not alone. All parts of the country are at risk, whether from more damaging physical impacts, low-carbon transition shocks or other social-economic ripples.

This timely report clearly outlines how global warming threatens our financial markets and the broader economy, and the critical role for state and federal financial regulators to address these risks. It explains the interplay between climate change, the global pandemic and systemic racism and makes the case for how they can be responded to holistically. And, importantly, it rejects arguments that climate change is a special interest or environmental issue—something I heard all too often during my time in Congress.

To the contrary, climate change is a colossal systemic economic threat. Action on climate change should be based on our understanding of climate risks and calibrated to the ever evolving science and should be divorced from petty politics.

Financial regulators such as the Federal Reserve System are uniquely positioned to take meaningful, coordinated steps to protect capital markets and the economy from climate-related shocks. They are also unique because they are nonpartisan. Their primary constituency is a healthy, fully-functioning economy—something all Americans care about. While it is encouraging to see the Federal Reserve and a handful of other federal and state regulators acknowledging and acting on the climate threat, far more action is needed. And quickly.

No doubt, U.S. financial regulators have a lot of catching up to do. For starters, they need to build on the efforts of their global peers, which are already mandating climate stress tests and other protective measures for their financial markets. But they will need to go even further. The ambition of their actions needs to align with the latest climate science, which indicates that time is short and that the necessity to significantly reduce carbon pollution is urgent.

Rather than standing back, state and federal financial regulators should seize the urgency of this moment. In doing so, they can unleash an economic transformation that will power future prosperity while preserving the planet as we now know it.

I hope they will carefully review this report and take decisive action.

Carlos Curbelo
Former U.S. Congressman and Principal, Vocero LLC

FOREWORD

Last June Ceres issued a call to action outlining why and how U.S. financial regulators should recognize and act on climate change as a systemic risk. In the nine months since then, that call is finally being heard and answered. Amid connected crises—the global pandemic, the resulting economic crisis, and ongoing racial injustice—more regulators are paying attention to climate. In addition, the Biden Administration has made climate change one of its top priorities following years of backward movement by the prior administration.

This is good news, but the urgency is greater than ever, and U.S. financial regulators are only just beginning their work. They need effective strategies to help them speed up their efforts, catch up with international regulators, and get to the shared destination we all desire: a sustainable future. While climate change affects us all, like the pandemic, it has a disproportionate impact on low-income communities and communities of color. Time is running out. With its latest report, **Turning up the Heat: The need for urgent action by U.S. financial regulators in addressing climate risk,** Ceres is providing a way forward.

As the New York State Department of Financial Services (DFS), under the leadership of Superintendent Linda A. Lacewell, developed its work to address the financial risks from climate change, Ceres was an essential collaborator and resource. With Ceres's collaboration, DFS has made significant progress in a very short time (months, not years) to ensure that our regulated entities take steps to address climate risks.

DFS is the first U.S. financial regulator, state or federal, to create a comprehensive climate program that includes supervision, consumer protection, and economic development. We issued guidance to our regulated insurers and banking institutions to start integrating the consideration of climate risks in their governance, risk management, and business strategies, and developing their approach to climate-related financial disclosure. We also encouraged banks to support the climate resilience of low- and moderate-income communities through their Community Reinvestment Act activities. This year, we began incorporating climate-related questions in our examinations for insurers. We also issued proposed Guidance for New York Domestic Insurers on Managing the Financial Risks from Climate Change for public comment.

A large part of accomplishing these goals is engaging in a continuous dialogue with our regulated companies. We held a series of webinars and industry roundtables to share best practices and hear the challenges. We understand that companies are affected differently by climate change and continue to recommend a proportionate approach.

Ceres has been a pioneer on climate change and sustainability. We are grateful for the opportunity to provide the foreword for this important report. While we are proud of our actions so far, these are initial steps, and would not have been possible without heeding the urgent call to action by collaborators like Ceres. We look forward to partnering with other U.S. financial regulators as they do the same.

Thank you,

Yue (Nina) Chen
Director of Sustainability and Climate Initiatives
New York State Department of Financial Services

EXECUTIVE SUMMARY

In June 2020, Ceres released **Addressing Climate as a Systemic Risk: A Call to Action for U.S. Financial Regulators**. It laid out how climate change threatens the stability of financial markets and the overall economy, and how and why U.S. financial regulators must address this systemic risk as part of their existing responsibilities.

Much has changed since the report's release 10 months ago.

We have seen early progress from financial regulators to acknowledge the systemic financial risks of climate change. Of particular note, in November 2020 the Federal Reserve identified climate as a near-term "financial stability risk." The U.S. Commodity Futures Trading Commission (CFTC) climate risk subcommittee issued a comprehensive report with an unequivocal warning: "Climate change poses a major risk to the stability of the U.S. financial system and its ability to sustain the US economy." Regulators are starting to indicate their intention to integrate climate change into their mandate and are starting to build up their own internal capacity.

Despite these advances, most U.S. federal and state financial regulators have yet to act on the climate crisis and lag far behind their global counterparts and what the science demands.

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SCORECARD for Initial Steps on Climate Change Action

This table identifies only the foundational steps that federal financial regulators should put in place to activate climate change across their mandate

	Affirmed climate change as systemic risk	Public research on climate change	Senior staff focused on climate change
Federal Reserve System	Chair remarks, Financial Stability Report (ACTION)	Conferences and events (ACTION)	Climate Supervision Committee (ACTION)
Federal Deposit Insurance Commission	Board member remarks (SOME ACTION)	(NO NOTABLE ACTION)	(NO NOTABLE ACTION)
Office of the Comptroller of the Currency	(NO NOTABLE ACTION)	(NO NOTABLE ACTION)	(NO NOTABLE ACTION)
National Credit Union Administration	(NO NOTABLE ACTION)	(NO NOTABLE ACTION)	(NO NOTABLE ACTION)
Securities and Exchange Commission	Acting Chair statement on climate disclosure, Acting Chair call for public comments (ACTION)	(NO NOTABLE ACTION)	Senior Policy Advisor for Climate and ESG and other staff (ACTION)
Commodity Futures Trading Commission	Acting Chair remarks (ACTION)	Climate-Related Market Risk Subcommittee report (ACTION)	Climate Risk Unit (ACTION)
Public Company Accounting Oversight Board	(NO NOTABLE ACTION)	(NO NOTABLE ACTION)	(NO NOTABLE ACTION)
Municipal Securities Rulemaking Board	(NO NOTABLE ACTION)	(NO NOTABLE ACTION)	(NO NOTABLE ACTION)
Federal Housing Finance Agency	Remarks by Director (SOME ACTION)	Economics of Climate Change Summit; RFI, summit and research by GSEs (ACTION)	Hired economist and recruiting two climate staff (ACTION)
Financial Stability Oversight Council	Treasury Secretary remarks on climate change (ACTION)	Commitment to establish a climate "hub" (SOME ACTION)	Senior staff (SOME ACTION)

ACTION SOME ACTION NO NOTABLE ACTION

Information as of March 30, 2021
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Click on hyperlinked text in boxes for further information

This lack of urgency is playing out in the face of mounting climate risks and a changing investment landscape

CLIMATE IMPACTS ON FINANCIAL MARKETS ARE GROWING

Physical impacts of climate change are exacerbating

Overall damages from record setting weather disasters—wildfires, floods and storms—across the U.S. totaled $95 billion, nearly double 2019

Systemic racism has worsened climate impacts on vulnera-ble communities

2020 put the spotlight on how historic social and economic inequality combine with climate impacts to disproportion-ately affect disenfranchised communities

Climate policy measures are gaining momentum

Government policies and legislative actions to reduce greenhouse gas emissions ramped up during the past nine months, driven by state action and the new Biden administration's pledge of net zero by 2050

Liability exposure from climate change is growing

The number of climate-related cases and proceedings hit 1,300, creating more financial risk for governments, companies, financial firms, and corporate directors

Low carbon investments are growing

In 2020 alone, the market capitalization of clean technology companies increased by nearly $1 trillion

Fossil fuel companies are struggling financially

North American and European oil and gas companies wrote off $145 billion in losses during the first nine months of 2020

Banks and insurers face growing risks from this transition

More than half of syndicated loans of major U.S. banks carry significant transition risk from indus-tries across the economy—agriculture, construction, manufacturing, as well as oil and gas

Climate impacts are interconnected and amplify each other

All of these impacts are interconnected and reinforce each other, creating far bigger risks to financial market instability

The past year was also marked by a national reckoning on systemic racism and its longstanding linkages to the American economy. Astonishing wealth gaps, damages from climate disasters and broader social and economic inequities were laid bare. Financial regulators can no longer afford to look at systemic racism, climate change or the pandemic in isolation. Each feeds into the other, with significant populations, especially communities of color, bearing the most severe burdens.

The coming months are a unique opportunity for U.S. financial regulators to leapfrog into global leadership on the climate crisis. With an engaged president and senior administration officials, financial regulators can help catalyze a low-carbon transition that will bolster the country's competitiveness while driving a more equitable economy. With the clock ticking on the climate crisis, quick and decisive action is crucial.

This report lays out the steps that U.S. financial regulators should take now to address climate change consistent with their mandates. Among our recommendations:

I. Immediately affirm the systemic nature of the climate crisis and impacts on financial market stability

This affirmation should be in the form of a statement from the agency chair or an agency issued report. It should underscore the risks posed by climate change to financial markets writ large and should outline specific action steps.

Such statements are particularly important given the complex nature of climate risks and continuing ambiguities about the extent to which the issue falls under specific agency mandates. Arguments that climate change is a special interest environmental issue and that climate solutions should be handled only through legislation are no longer valid.

Some state and federal financial regulators have already acknowledged the systemic nature of climate risks, including the Federal Reserve, the CFTC and the New York State Department of Financial Services. Many global regulators, especially in Europe, have also taken this first step.

II. Activate action on climate-related measures, including prudential supervision, investor protections and enhanced climate disclosure mandates

PRUDENTIAL SUPERVISION

Many U.S. regulators have explicit responsibilities to supervise the risks that financial institutions and the financial sector take on. Consistent with this mandate, financial regulators should be integrating climate change into their prudential supervision of banks, insurance companies and other regulated institutions.

The **Federal Reserve**, in particular, should take immediate steps to assess the overall health of financial markets from climate risks and should mandate climate scenario analyses by banks and other financial institutions. The Fed should also outline plans for conducting climate stress tests, which measure how climate-related shocks, whether from a sudden drop in economic growth or the decline of a specific industry, would affect individual institutions and the broader financial system. Many other central banks globally are already taking such steps.

Stronger leadership is needed from other federal and state regulators as well. The Federal Reserve should coordinate with other banking regulators to develop guidance on how financial institutions should integrate climate change into their risk management, internal controls, business strategies, governance and disclosures. State insurance and bank regulators should also require banks and insurers to address climate risks. The New York Department of Financial Services issued proposed guidance on climate change to the banks and insurance companies it supervises.

INVESTOR PROTECTIONS

Reinstating and reinforcing mechanisms that help investors manage climate risks should be a high priority for financial regulators.

The **Securities and Exchange Commission** (SEC) and **Department of Labor** (DOL) play especially important roles in influencing how investors can consider climate change in decision-making. Many SEC- and DOL-governed rules that investors have long relied on were stripped away in 2020 under the Trump administration.

The SEC and DOL should move immediately to amend or eliminate Trump era rules, including SEC Rule 14a-8 that increases share ownership requirements for filing shareholder proxy proposals and DOL Rule 1210-AB95, which limits how fund managers can consider climate and ESG (environmental, social and governance) factors when making decisions on 401-Ks and other retirements plans governed under the ERISA law. The DOL has recently announced that it will not enforce Role 1210-AB95.

MANDATE CLIMATE CHANGE DISCLOSURE

While current voluntary climate disclosure practices have been important steps, they are not producing the standardized, reliable and actionable data that investors and other market players need to assess risks and make informed decisions. The SEC should build on its initial steps and issue rules mandating climate change disclosure, building on reporting frameworks developed by the Task Force on Climate-related Financial Disclosures (TCFD).

Other federal financial regulators should coordinate with the SEC and identify opportunities to get additional climate disclosures from industries that they supervise.

Some U.S. regulators are already moving in this direction. In February 2021, the SEC's Acting Chair Allison Herren Lee directed SEC staff to enhance their focus on climate-related disclosures. In March, she called for public comments to inform the SEC's thinking on climate change disclosure rules.

III. Pursue holistic approaches, including considering climate impacts in addressing the pandemic and addressing systemic racism and the climate crisis as interrelated stability risks

Financial regulators, especially the Fed, should more proactively link pandemic recovery efforts to climate mitigation and resiliency. Among the options the Fed should consider include withholding financial support for assets with significant climate risk exposure, attaching climate conditions to loans made to carbon intensive industries and including climate factors in qualitative easing.

Financial regulators should also develop strategies to address systemic risks of climate change and structural racism in an integrated way. The Community Reinvestment Act (CRA) especially offers ripe opportunities to enhance financial access and economic and climate resilience for low-income and vulnerable communities. Ceres submitted specific recommendations in this regard as part of the Fed's recent public comment process for modernizing CRA regulations.

IV. Build capacity for smart decision-making on climate change by coordinating action with other U.S. financial regulators, global peers and other external stakeholders and by hiring and training staff

Coordinated action by U.S. financial regulators at the federal and state levels and with global financial regulators is essential to accelerating climate mitigation efforts and low-carbon capital flows. The Financial Stability Oversight Council (FSOC), which plays a critical coordination role among federal financial regulators, should immediately declare that climate change threatens financial stability and start engaging with members to develop coordinated responses, including on prudential oversight and climate disclosure.

The FSOC could also charter a "climate committee" comprised of relevant member regulators to drive climate action across the regulatory ecosystem. Related to this, Treasury Secretary Janet Yellen recently pledged to develop a Treasury "Hub" that would examine financial system risks from climate change. This hub could also coordinate with the FSOC and Office of Financial Research on needed research on climate-related impacts on market stability.

Financial regulators should also find opportunities to coordinate with global peers to build on their learnings and experiences to date and to develop a shared global playbook for action. For example, by recently joining the global Network for Greening the Financial System, the Fed is well positioned to coordinate with other global central banks on issues such as climate stress testing scenarios.

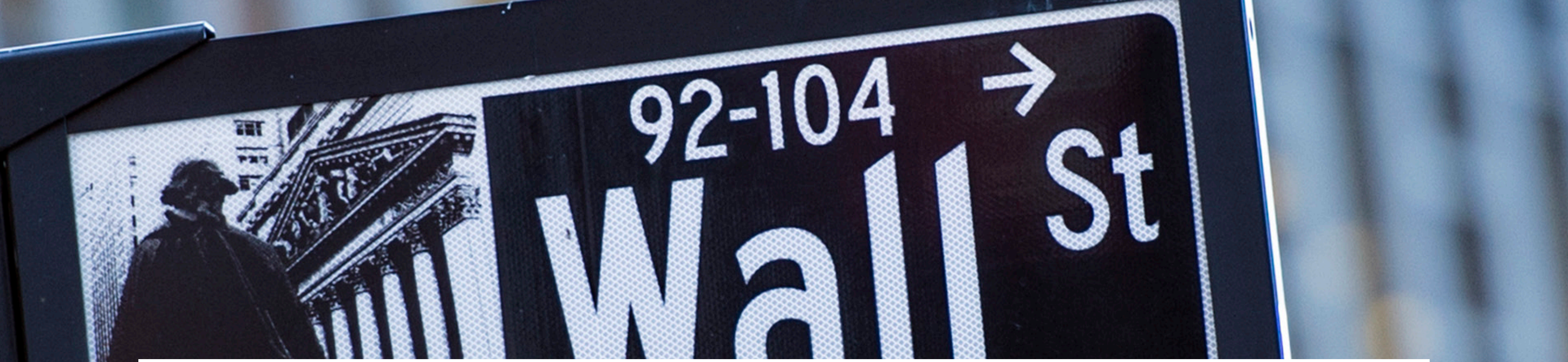
Finally, regulators should hire staff with expertise with climate change, and educate and train existing staff on how climate change fits into their roles. Regulators could also consult with external advisory groups, including advocacy groups, scientists, academics, industry groups and others, in pursuing an informed approach to climate change regulation.

Our full list of recommendations is available on pages 17-37.

CONCLUSION

U.S. financial regulators have a critical role to play in bolstering our economy, weakened from a global pandemic and threatened by future climate shocks. Financial regulators in countries around the globe have shown leadership in this work. Rather than standing back, U.S. regulators should seize the vast opportunity of a sweeping economic transformation that can stabilize our climate while reducing long-standing social and economic inequalities.

INTRODUCTION



There has been a growing recognition of the sweeping systemic nature of climate-related risks and the lack of action by U.S. financial regulators to respond to these risks, even as other global peers are taking aggressive steps.

In June 2020, the Ceres Accelerator for Sustainable Capital Markets released **Addressing Climate as a Systemic Risk: A Call to Action for U.S. Financial Regulators**.[1] The report laid out how climate change threatens the stability of financial markets and the economy. It outlined how and why U.S. financial regulators, who are charged with protecting the stability and competitiveness of the U.S. economy, must address this systemic risk as part of their existing responsibilities.

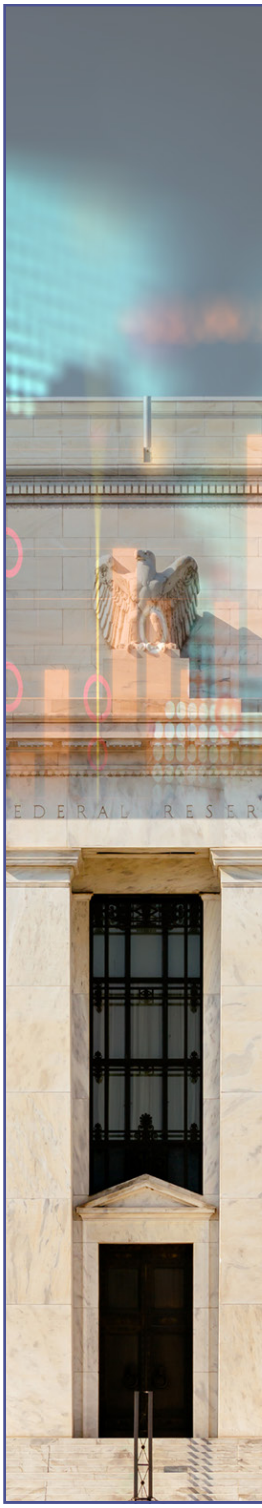
Since then, the case for action by U.S. regulators has become more urgent and clear. The devastating global pandemic, more damaging and costlier extreme weather events and a nationwide reckoning on racism laid bare systemic, intertwined risks and inequities. A deeper, faster shift to a low-carbon economy sent the valuations of clean energy companies skyrocketing while the market cap of fossil fuel companies contracted, underscoring the market's expectations for future growth. And, of course, in President Joseph R. Biden Jr., the U.S. now has a leader who made climate action a top priority.

In response, we have seen early progress from the Federal Reserve and a few other federal and state U.S. financial regulators in recognizing the links between climate stability and economic resiliency. But most U.S. regulators have yet to acknowledge the systemic nature of the climate crisis and take steps to address it.

The coming months are a unique opportunity for U.S. financial regulators to leapfrog into global leadership. With an engaged administration, we can accelerate the low-carbon transition, spur innovation and job creation, protect investors and consumers, bolster the country's competitiveness and jumpstart a more equitable economy that benefits all Americans. Quick and decisive action is critical.

This report builds upon Ceres' June 2020 call to action by outlining the physical, transition and systemic risks of the climate crisis and tracking progress by U.S. and global financial regulators to address the crisis. It lays out the steps that U.S. financial regulators should take now to address climate change as a part of their mandate.

The Ceres 2020 report Addressing Climate Change as a Systemic Risk called on U.S. financial regulators to proactively address and act on climate change across their mandates to:



AFFIRM that climate change is a systemic risk

ASSESS climate impacts on financial market stability

INTEGRATE climate change into prudential supervision

MANDATE climate change disclosure

COORDINATE with each other and the global regulator community to develop a shared approach to addressing the global crisis

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Agency specific recommendations include:

Federal Reserve System
Financial Stability, Supervision, Prudential Regulation, Monetary Policy, Community Investment, International Cooperation

Office of Comptroller of the Currency & Federal Deposit Insurance Corporation
Supervision, Stress Tests, Deposit Insurance Fund Impacts

Securities and Exchange Commission
Research on Impacts on Securities Market, Fiduciary Duty, Disclosure, Accountants and Auditors, Credit Raters

Commodity Futures Trading Commission
Climate Change Subcommittee (Ceres CEO, Mindy Lubber is a key member)

State & Federal Insurance Regulators
Risk Management, Investments, Disclosure, Products

Federal Housing Finance Agency
Climate Impacts on Mortgage-backed Assets

Financial Stability Oversight Council
Coordination between Federal Agencies on Climate

CLIMATE IMPACTS ON FINANCIAL MARKETS ARE GROWING

Our earlier report, **Addressing Climate as a Systemic Risk,** highlighted how climate change and its cascading ripples—the physical risks to real assets due to climate-fueled weather events, the transition risks posed by regulatory, technological or investor sentiment changes during a shift to a low-carbon economy and other socio-economic shifts—are creating profound long-term risks for financial markets and the economy. It also described how each of these trends are interconnected and growing, creating even larger threats to market stability.

The evidence that these climate risks are already having a significant impact on financial markets ratcheted up during the past ten months. The risks, as well as the opportunities from climate-related trends are already causing shifts in corporate strategies and investment flows. These powerful shifts will only grow stronger as the Biden administration joins other governments around the world in embracing bolder climate agendas.

And despite efforts to cast financial regulator action on climate change as a "special interest issue,"[2] the evidence (see Appendix and following graphic) clearly demonstrates that climate risk is a material financial risk, the scale of which poses threats to financial market stability.

This lack of urgency is playing out in the face of mounting climate risks and a changing investment landscape

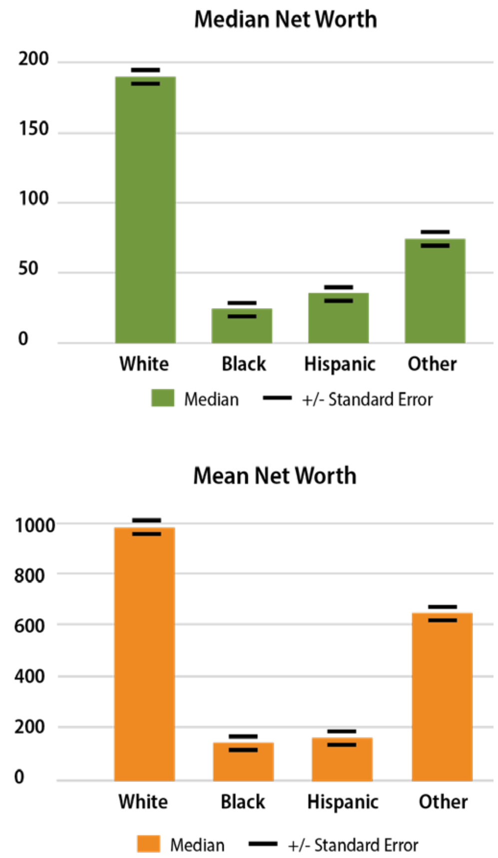
Systemic racism has worsened climate impacts on vulnerable communities

While scientists have recognized the potential for climate-driven economic disruption for decades, systemic racism has been a defining feature of the American economy much longer. The killings of Ahmaud Arbery, George Floyd, Breonna Taylor and others sparked a national conversation—and reckoning—over how public and private sector actors have both contributed to this system, and also benefited from it.

From a financial market perspective, centuries of racism have led to astonishing wealth gaps.[3] The net worth of a typical white family is nearly 10 times greater than that of a typical Black family. Research from the Federal Reserve demonstrates that the median and mean family wealth of Black and Hispanic families is less than 15% of white families,[4] and such disparities are likely to persist across generations. This has contributed to long-standing health, educational and social inequities.

The cumulative impacts of these broad disparities are having a powerful financial impact. A Citi report released last fall estimates that the country's aggregate economic output since 2000 would have been $16 trillion higher if racial wage, education and other gaps had been closed.[6] The researchers estimate that economic activity could be $5 trillion higher over the next five years if equal opportunities are achieved.

Wealth by race and ethnicity



Source: Federal Reserve Board, 2019 Survey of Consumer Finances [5]

These disparities have meant that climate change impacts—both the causes and the consequences—also fall harder on communities of color.[7] Numerous studies have shown that high polluting power plants and refineries are more often sited closer to Black communities than white communities, in part because of historic redlining practices.[8] This has resulted in poor air quality[9] and adverse health impacts.[10] An analysis of 108 U.S. cities found that poor urban neighborhoods are disproportionately hotter[11] than wealthier urban neighborhoods, in some cases by nearly 13 degrees. Extreme heat is considered one of the most serious threats to human health in urban areas.

These disenfranchised populations are also less likely to receive financial assistance after natural disasters or investments for climate resiliency or climate solutions. A 2018 Rice University study found that natural disasters actually widen racial gaps.[12] While white communities saw an increase in average wealth after natural disasters, minority communities saw a drop. It also showed that white communities received more aid after natural disasters. A study from the Federal Reserve Bank of San Francisco also found an overlap between communities in need[13] of financial investment and those impacted by extreme weather events.

The latest wave of devastating hurricanes, wildfires and other extreme weather events exposed all of these disparities. Back-to-back hurricanes in Lake Charles, Louisiana, a city where half the population is Black, left tens of thousands without power and water[14] amid suffocating heat and humidity. California's record wildfires caused poor air quality for everyone, but African Americans, who are more likely to have asthma, suffered more.[15] They also have fewer options for travel and for working from home. Last summer's record high temperatures in Arizona sparked another record year of heat deaths,[16] with many of the victims being the homeless or migrants crossing the border.[17]

CALLS FOR FINANCIAL REGULATOR ACTION ON CLIMATE CHANGE

"We need leadership from every U.S. financial regulator to transition to a resilient, sustainable, low-carbon economy and avoid a climate-fueled financial collapse."

Betty T. Yee California State Controller, July 2020[18]

Stakeholders across the financial system are now starting to consider steps that the regulatory community could play to build resilience in markets and counteract the worst impacts of the climate crisis.

A range of stakeholders are calling on financial regulators to act on climate change

Addressing Climate as a Systemic Risk made the case that, given the systemic risk posed by the climate crisis, U.S. financial regulators should address and act on climate change as a part of their existing mandates to protect the safety and soundness of the U.S. economy and key industries. Over the past 10 months, we have seen this call to action reiterated by a range of financial market stakeholders.

INVESTORS In July 2020, investors representing $1 trillion in assets joined a bipartisan group of former regulators, politicians and others in calling on the heads of major U.S. regulatory agencies to affirm the systemic nature of the climate threat,[19] consider how their regulatory decisions could worsen the problem and consider implementing "a broader range of actions to explicitly integrate climate change across (their) mandates."

LAWMAKERS In July and August 2020, the House Select Committee on the Climate Crisis[20] and U.S. Senate Democrats issued separate climate reports,[21] both of which included a detailed focus on the role of financial regulators on climate change. This was supplemented by legislative proposals calling for stronger responses from financial regulators on climate change. U.S. Senator Dianne Feinstein of California and others introduced the Addressing Climate as a Financial Risk Act,[22] calling for wide-ranging actions by the FSOC, banking regulators and other bodies. Representatives Emanuel Cleaver and Rashida Tlaib introduced the Restructuring Environmentally Sound Pensions in Order to Negate Disaster Act[23] to protect federal pensions from the economic impact of climate change by establishing a climate advisory panel within the Federal Retirement Thrift Investment Board. The bill would also require the Federal Reserve's Board of Governors and the SEC to issue annual reports on the economic costs of climate impacts.

REGULATORS As previously noted, in September 2020 a subcommittee of the Commodity Futures Trading Commission (CFTC) published the first-ever climate report by a U.S. financial regulator, affirming climate change as a systemic risk and recommending sweeping steps that financial regulators should take[24] to integrate climate change risks into their oversight functions.

Yet, regulator responses are still in the initial stages of action, and not commensurate with the urgency of the crisis

The calls to action, increasing international regulatory actions, greater awareness of the challenges and the new administration have precipitated some action from U.S. financial regulators. Yet, the actions taken so far are still only in the initial stages. Most financial regulators still fall far short of steps taken by other financial regulators in Europe, Canada, Japan and dozens of other countries.

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The science of climate is clear: We have a limited time window—less than 10 years[25] to reverse carbon emission levels—before some of the impacts of climate change become irreversible. While emission levels dropped during the pandemic,[26] they will surely rise again as we resume "business-as-usual" in our post-pandemic recovery. Compounding this colossal challenge is the short-term bias of most financial markets, what former Bank of England Governor Mark Carney called "the tragedy of the horizon,"[27] where key decisions are driven by stakeholders bound by narrow timelines, such as quarterly corporate returns and four-year political cycles.

Federal and state financial regulators, whose mandate is to ensure long-lasting market stability, are uniquely positioned to shift our economic path by using long-term risk awareness to motivate ambitious short-term action. They must learn and act at the same time, and with ambition that matches what climate science demands. They must immediately take steps to integrate climate change into their roles.

ACTIONS NEEDED IN THE COMING MONTHS

> "As the world struggles to make up for its lack of preparedness for the Covid-19 pandemic, 2021 is the year to reimagine capital as a tool for accelerating and smoothing the transition to a world of net-zero carbon emissions. American monetary policy and financial regulatory policy can focus on a climate-durable recovery and the US agencies responsible for these policies can add to the early momentum of their global counterparts."

Sarah Bloom Raskin Former member, Federal Reserve Board of Governors; Former U.S. Deputy Secretary of the Treasury, January 2021[28]

Given the mounting evidence of the systemic nature of the climate crisis, there is a growing urgency for U.S. financial regulators to act with ambition aligned with the latest climate science and President Biden's climate goals. The new administration and its regulatory appointees need to make up for lost time. Regulators can also build on efforts already taken by their global peers. They should also leverage opportunities for coordination and collaboration.

Here are specific steps that we are looking for U.S. financial regulators to take.

IMMEDIATELY AFFIRM THE SYSTEMIC NATURE OF THE CLIMATE CRISIS AND OUTLINE ACTION STEPS THEY WILL TAKE

Recognizing that climate change poses a financial stability risk is a critical first step for all financial regulators and will, in itself, send an important message to all financial market stakeholders.

All U.S. financial regulators should immediately affirm the systemic risk of climate change.

This affirmation should be in the form of a statement from the agency chair or an agency issued report. It should underscore the risks posed by climate change to financial markets writ large, and discuss the mandate of their agency in particular. The statement should also outline the specific action steps the agency is planning or undertaking to address climate risks.

Such a statement is particularly important given the complex nature of climate risks and continuing ambiguities about the extent to which the issue falls under specific agency mandates. Opponents have argued that climate change is a special interest environmental issue,[29] and that solutions to climate change should be handled legislatively.

Scientific evidence going back decades and recent catastrophic events, however, have exposed this theory for the fiction that it is. Issues previously deemed “environmental” or “social,” such as public health, climate-driven natural disasters and racial inequity, are increasingly having material financial impacts. While broad-based legislative solutions such as a carbon price are critical to tackling the climate crisis, financial regulatory action using existing authorities to address impacts on financial markets, commodities trading, mortgage lending, insurance and other core economic activities is just as important.

Some federal and state financial regulators have noted the systemic nature of climate change risks.

- **Federal Reserve** In its November 2020 Financial Stability Report, the Federal Reserve identified climate as a near-term “financial stability risk”[30] that will likely increase financial shocks and financial system vulnerabilities and noted that the agency was in early stages of addressing this risk in its oversight. “It is vitally important to move from the recognition that climate change poses significant financial stability risks to the stage where the quantitative implications of those risks are appropriately assessed and addressed,” wrote Federal Reserve Governor Lael Brainard, in an accompanying statement to the report.[31]
- **New York Department of Financial Services** In her October 2020 guidance on climate change[32] to New York regulated banks and financial institutions, Linda Lacewell, superintendent of the New York State Department of Financial Services (DFS), stated: “We live in an increasingly complex world in which crises proliferate and magnify risks to our financial system. Together we are correctly focused on public health, the economy, and racial justice. A fourth crisis, climate change, poses significant financial risks as well.” Her circulars also outlined how climate change impacted the insurance[33] and banking[34] industries.
- **Commodity Futures Trading Commission** The strongest affirmation so far comes[35] from a CFTC expert advisory committee, which unequivocally stated in its report: “Climate change poses a major risk to the stability of the U.S. financial system and to its ability to sustain the American economy.” Acting CFTC Chair Rostin Behnam, who commissioned the report, has publicly spoken out about the systemic nature of climate change risks on a number of occasions.[36, 37]

Many global regulators have taken this first step. A July Financial Stability Board survey of 33 financial regulators found that about three-quarters of respondents were considering or were planning to consider climate-related risks as part of their financial stability monitoring.[38]

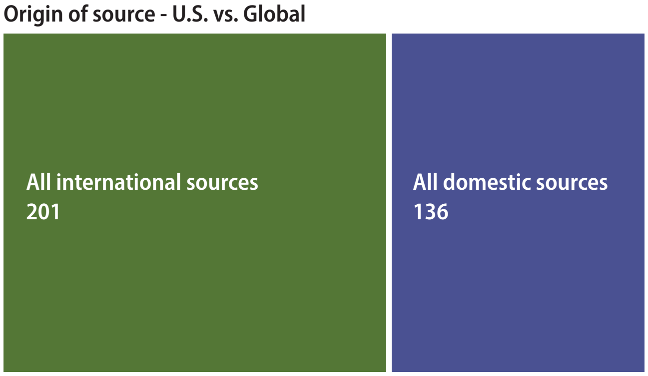
A speech last fall by Sabine Mauderer, member of the Deutsche Bundesbank's Executive Board, strongly articulates the role financial regulators can play[39] on climate change. She notes that central banks and other financial regulators are critical in catalyzing the shifts needed for comprehensive carbon pricing, public and private sector transformation and financial sector action.

As can be seen from the figure below, the number of speeches by financial regulators acknowledging the role that they can and are playing to address climate change has grown significantly in the last months. Affirming legislation on this role, while not needed for regulators to enact their mandate, could remove any ambiguities relating to their role now and in the future.

Materials and sources collected since June 2020 report

This report draws from a growing cascade of 337 reports, briefs, speeches, articles, case studies, public letters and other resources which were published during that 10 months since the release of **Addressing Climate as a Systemic Risk** and that spotlight the financial implications of climate risk.

Origin of source - U.S. vs. Global



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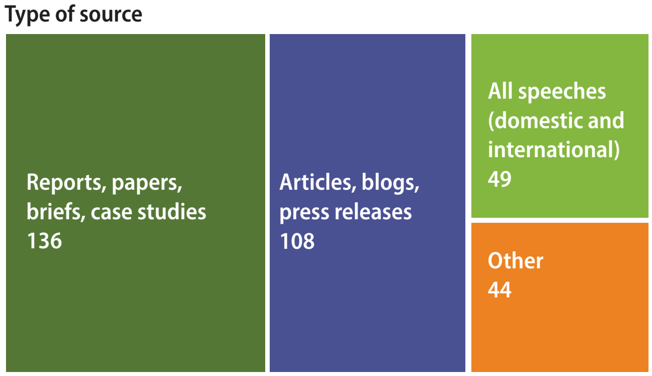

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INTEGRATE CLIMATE CHANGE INTO PRUDENTIAL SUPERVISION

> "Federal Reserve supervisors expect banks to have systems in place that appropriately identify, measure, control, and monitor all of their material risks, which for many banks are likely to extend to climate risks."

Board of Governors of the Federal Reserve System Financial Stability Report, November 2020[40]

The U.S. financial industry—banks and insurance companies, in particular—is significantly exposed to climate change risks through lending and investment portfolios, as well as other products. As part of their role in monitoring the safety and soundness of individual institutions and the industry, many regulators have explicit responsibilities to supervise the risks the financial sector takes on and the ways that these risks are managed. **Assessing Climate as a Systemic Risk** calls on U.S. financial regulators to integrate climate change into their prudential supervision.

Financial regulators should provide public details on how this prudential supervision will work vis-a-vis the markets they oversee, and implement such supervision in the short term.

BANKING AND INSURANCE REGULATORS

The Federal Reserve should immediately take steps to:

- **Assess the overall health of financial markets from climate risks.**
- **Mandate climate scenario analyses in coordination with other banking regulators.**
- **Chart a plan to conduct climate stress tests.**

We are encouraged by the preliminary supervisory expectations on addressing climate risks set forth in the Federal Reserve's Supervision and Regulation Reports. These are important first steps in communicating to the public and supervised entities how the Fed plans to integrate climate into its macro and microprudential mandates.

However, we recommend further immediate action in line with global peers. Over the past 10 months, global financial regulators, including central banks, have taken major strides to integrate climate change into prudential supervision.

Central banks from a number of countries, including Japan,[41] Singapore[42] and Canada,[43] have joined England, France, Australia, the Netherlands and the European Central Bank in planning for climate change stress tests or mandatory scenario analyses of their financial sectors. In November, the Bank of England announced that its tests, which were postponed by a year due to the pandemic, would be conducted in July 2021.[44]

The goal of these tests is to assess the resilience of the financial sector to climate risks and identify where corrective actions may be needed. Different regulators are taking different measures on conducting such analyses. For instance:

- The U.K. and France are both using 30-year climate change scenarios[45] and are calling on banks to run their own "bottom up" analytics. However, these exercises will not formally test the banks' own capital adequacy requirements, a step that is more typical of conventional stress tests.
- Guidance issued in November by the European Central Bank (ECB) calls on banks to conduct climate change self-assessments in 2021[46] and engage with regulators. In 2022, the ECB will conduct a full supervisory review of bank practices, including full supervisory stress tests that include climate change risks. Similarly, Japan's financial regulatory authority is expected to use loan book data of the country's five largest banks[47] in conducting its own stress tests.

As of March 2021, the Federal Reserve has not publicly clarified the specific approaches or plans it will use to assess U.S. financial market stability vis-a-vis climate change. While the Financial Stability Report and Supervision and Regulation Report, as well as speeches by Federal Reserve Governors and other Reserve officials have explained initial steps that are underway, there remains a lack of public clarity regarding which of the Fed's extensive collection of policy and supervision tools will be immediately focused on these urgent risks.

However, December 2020 remarks by Federal Reserve Board Governor Lael Brainard make clear the value of mandatory scenario analysis,[48] using long-term assessment horizons of 10 to 30 years. According to Brainard, such an approach, aligned with current financial sector approaches, would yield valuable insights about the exposure and resilience of specific companies that can be extrapolated market wide. The insights would also help supervisors make recommendations on business models and risk governance.

"Climate scenario analysis identifies climate-related physical and transition risk factors facing financial firms, formulates appropriate stresses of those risk factors under different scenarios, and measures their effects on financial intermediaries and the financial system. This analytic approach gives us a structured way of uncovering the parts of the financial system where physical, transition, and other risks may have outsized effects through potential spillovers. It also helps identify the limits of our knowledge."

Governor Lael Brainard Ceres 2021, March 2021[49]

Ceres also called on the Federal Reserve to also consider climate stress tests,[50] either stand-alone stress testing on climate change or integrating climate variables into annual stress tests, with the goal of using capital charges or risk weighting to address risks that are exposed. The targeted adjustments made by the Federal Reserve to its 2020 stress tests,[51] based on a formal "sensitivity analysis to explore the vulnerabilities of banks" of banks to the downside impacts of the pandemic, are a useful model to consider. The CFTC Climate Risk Subcommittee has highlighted the potential for the Federal Reserve to integrate climate risk consideration[52] into the Comprehensive Capital Analysis and Review (CCAR).

The Federal Reserve should identify modeling and data limitations relating to integrating climate change into its prudential supervision and detail the agency's plans to address these limitations.

While financial regulators are increasingly turning to scenario analyses and stress tests to understand the impacts of the climate crisis on financial markets, there has also been a growing focus on the extent to which climate science models and available data can be appropriately used to inform financial risk analysis.

For example, regulators are considering the difficulties[53] associated with predicting the time and scale of physical risk events and tipping points, the uncertainty associated with policy development and technology evolutions, and the differences across geographies and sectors. A February 2021 study noted that financial decision timeframes span from milliseconds to over 40 years, and concluded that scientific models need to be further developed[54] before they can be used to accurately inform how climate change will affect financial risk. While many of the scientific models have applicability over a longer timeframe, commentators have noted that reducing these to a 30-year time horizon (the typical timeframe for scenario analysis) or even shorter timeframes puts a strain on the validity of the outputs[55] that the models generate.

Additionally, questions have been raised as to whether the climate change scenarios developed by the Network for Greening the Financial System (NGFS) go far enough to drive the needed decarbonization[56] in the financial sector.

However, the perfect should not be the enemy of the good. Despite the uncertainties, the Federal Reserve should continue the essential macroprudential work needed to assess climate change impacts on financial markets in an iterative and phased manner, acknowledging limitations to existing approaches and encouraging innovation and experimentation from supervised entities.

The Federal Reserve is involved in a range of initiatives with domestic and global peer regulators and U.S. science agencies to begin addressing gaps and to develop shared methodologies to move forward with macro- and microprudential risk assessment and supervision. We recognize and welcome these efforts. However, more transparency and regular reporting is needed to ensure other U.S. financial regulators, legislators, supervised entities, investors, impacted municipalities and communities and other stakeholders benefit from the Federal Reserve's investments in this area.

Such a report could include, for example, explanations of the opportunities, progress and outcomes of Federal Reserve engagements to address data and modeling gaps via the:

- Office of Financial Research (OFR)
- U.S. Global Change Research Program
- Network for Greening the Financial System (NGFS) workstream on "Bridging the Data Gaps"
- Basel Committee on Banking Supervision's Task Force on Climate-Related Financial Risks (TFCR)
- Financial Stability Board work on climate change

A report could include updates on research to inform the development of baseline rules for use in climate scenario analysis and stress tests and practical recommendations on leading practices to employ analytics that integrate geographic scales and timeframes that generate more accurate modeling results.

The Federal Reserve should coordinate with the Office of the Comptroller of the Currency (OCC), the Federal Deposit Insurance Corporation (FDIC) and the National Credit Union Administration (NCUA) to develop guidance on how financial institutions should integrate climate change into their risk management, internal controls, business strategies, governance and disclosures.

This process should include the review and revision of the examination manuals to include climate risk considerations in a way that is consistent across these agencies.

In May 2020, the NGFS issued a report outlining wide-ranging steps financial regulators should consider[57] to integrate climate change into their prudential supervision. Despite this, most federal U.S. banking regulators have yet to announce formal plans to integrate climate risks into prudential supervision, and indeed have provided mixed messaging.

We have seen some preliminary statements from the Federal Reserve indicating that the regulator will work towards issuing guidance on climate change. The Federal Reserve's Financial Stability Report issued in November noted: "Federal Reserve supervisors expect banks to have systems in place that appropriately identify, measure, control, and monitor all of their material risks, which for many banks are likely to extend to climate risks."[58] The Fed's Supervision and Regulation Report made a similar point: "Federal Reserve supervisors are responsible for ensuring that supervised institutions operate in a safe and sound manner and can continue to provide financial services to their customers in the face of all types of risks, including those related to climate change." It noted that: "Supervisors will seek to better understand, measure, and mitigate climate-related financial risks,[59] including through analysis of transmission channels of climate change risk to the banking sector, measurement methodologies, and data gaps and challenges."

In an important new step, in January 2021 the Federal Reserve announced the creation of the Supervision Climate Committee, a newly formed systemwide group[60] with the mandate of building the Fed's capacity to understand the implications of climate change on financial institutions, infrastructure and markets. In March 2021, the Federal Reserve announced the creation of a Financial Stability Climate Committee[61] that is intended to address climate risks from "a macroprudential perspective - that is one that considers the potential for complex interactions across the financial system".

In December 2020, Martin Gruenberg, member of the FDIC's Board of Governors acknowledged that climate change was a financial stability risk[62] and noted "regulators need to provide direction now to financial institutions to develop plans to identify, monitor, and manage the risks posed by climate change." In March 2021, Chair Jelena McWilliams noted that the departments across the agency were conducting research on the "potential impacts of climate change on the financial sector," and had set a goal to make such research cohesive.[63] However, as of March 2021, the FDIC has not yet issued any directive on climate change.

The OCC is furthest behind. In stark contrast to the other banking regulators, a new OCC rule[64] issued in the final days of the Trump presidency misuses the "fair access" doctrine to push back against efforts by banks to cease lending to key sectors, such as coal mining, coal-fired power generation and oil exploration, noting that "benchmarks unrelated to financial risk," such as "carbon emissions," cannot be used to limit lending to key sectors. The new rule received fierce pushback from a diverse group of stakeholders, including banks, trade associations and investors. In a welcome move, the rule was put on hold by the new acting comptroller.[65]

State insurance and bank regulators should require banks and insurers to address climate risks as part of their enterprise risk management and conduct climate scenario analysis.

Stronger leadership has come from some state banking regulators. In particular, the New York Department of Financial Services (DFS) sent letters[66] last year to financial institutions and insurance companies that are regulated by the department, calling on them to integrate climate change into their governance structures, risk management and disclosures. In addition to issuing guidance, the DFS organized several "learning sessions" intended to socialize leading practices in climate change with its regulated companies. Finally, in March 2021, the DFS released detailed guidance for insurance companies on managing climate risk.

The National Credit Union Administration should consider the guidance provided by banking regulators to assess how climate change could affect the market segments they supervise.

Like banks, credit unions are also susceptible to the physical and transition risks from climate change. As a first step, the National Credit Union Administration should issue a statement highlighting that climate is a systemic risk to the financial institutions, including credit unions.

Building on this, the agency could, in conjunction with the Federal Financial Institutions Examination Council interagency group, modernize its risk definitions as a part of the credit supervision process to include climate risk, either as a stand-alone category or as something more explicitly articulated throughout the seven established risk categories. Any guidance on climate informed supervision could also be integrated into the NCUA's examination manual and process for chartering new unions.

Finally, given the unique nature of credit unions, the NCUA should, among other steps, explore working closely with the largest credit unions that they serve to run pilots on best practices in credit union-specific climate risk management techniques and risk analysis tools and methods.

MORTGAGE REGULATORS

Ceres' **Addressing Climate as a Systemic Risk** report noted that climate change poses growing risks to the mortgage market. It called on the Federal Housing Finance Agency (FHFA), which is responsible for the two government-sponsored enterprises (GSEs), mortgage giants Fannie Mae and Freddie Mac to acknowledge climate change, examine its impacts on mortgage holdings of Fannie Mae and Freddie Mac, and launch a formal effort to address climate change risks.

The FHFA should immediately assess the climate change exposure of mortgage holdings of the GSEs and the Federal Home Loan Banks, keeping in mind up-to-date projections on the impacts of climate change on commercial and residential properties, as well as investing in new research to stay current.

Building on this research, the FHFA should begin a process to update its examiner's manual to include climate change considerations.

The FHFA should also collect and publicly disclose portfolio level and asset level data on climate risks across all perils.

Over the past nine months, there has been a flood of new research on climate impacts on residential and commercial property markets–in particular, taxpayer-backed Freddie Mae and Fannie Mac, which hold trillions of dollars of mortgages.

In summer 2020, a report by the nonprofit First Street Foundation found that 14.6 million homes—nearly 70% more than FEMA had recognized—were at substantial risk of flooding[67] and that the numbers will surely grow in the years ahead.

An August 2020 research paper published by the San Francisco Federal Reserve focused additional attention on housing-related impacts in low-income communities. It warned that policy changes that do not adequately consider behavioral impacts could have the unintended consequence of "sorting" low income and minority groups into high flood risk areas[68]–trends that would have "long lasting implications for disaster vulnerability, recovery, and fiscal policy."

In January 2021, given the role of the Federal Emergency Management Agency (FEMA) to oversee the National Flood Insurance Program, NRDC filed a petition calling on FEMA to account for increased flood risk due to climate change[69] as a part of its efforts to issue regulations to implement the National Flood Insurance Program, including developing and maintaining flood maps and designing building, land use and floodplain management plans.

A July 2020 report from Dr. Lindsay Owens and the Great Democracy Initiative also highlighted detailed policy recommendations[70] for the FHFA to consider, including:

- Investments in high-quality, asset-level data on common perils, including from flooding and wildfires. This data could be used to update FEMA's flood maps but also be made available to homebuyers, lenders and investors.
- Performance of a "climate audit" of GSEs to account for exposure to mortgage debt from climate change.
- Possible modifications of capital standards in light of growing climate risks.
- Consideration of a suite of options to assist homeowners in certain at-risk regions, particularly Black and brown homeowners who have already borne the brunt of discriminatory housing policies.

We have also seen early action from the FHFA on climate change. In 2020, they set up a Natural Disaster Risk Working Group with representation across the FHFA to better understand climate risks in housing markets. The group has been meeting with climate scientists, researchers, other government agencies, and policy advocacy groups. In January 2021, the FHFA also released a formal "request for input"[71] on Climate and Natural Disaster Risk Management at the Regulated Entities, detailing 26 questions to gather information that:

> "[...] will enhance FHFA's ability to fulfill its statutory responsibilities to ensure that the regulated entities (i) operate in a safe and sound manner, (ii) fulfill their statutory missions, and (iii) foster the liquidity, efficiency, competitiveness, and resiliency of the national housing finance markets. FHFA also seeks input on opportunities to strengthen its supervision and regulation of the regulated entities' management of and reporting on the physical and transition risks that may arise from natural disasters and changes in climate patterns."

In November 2020, the FHFA finalized a capital regulation rule that called for the inclusion of a minimum capital floor in every GSE backed mortgage[72] in light of a variety of difficult to quantify risks, such as "risks that climate change could pose to property values in some localities."

Other agencies, including the Federal Housing Administration, insure mortgages that also face significant climate risks.[73] It is important they also take similar actions.

State mortgage regulators should incorporate climate risks into their prudential standards for nonbank mortgage lenders and mortgage servicers.

Each state licenses and supervises nonbank mortgage lenders. In addition, most states license and supervise nonbank mortgage servicers. The share of both mortgages originated and mortgages serviced by banks has steadily decreased.[74] Today, nonbanks originate the majority of mortgages and service over 40%[75] of the outstanding mortgages. In its 2014 Annual Report,[76] the Financial Stability Oversight Council (FSOC) identified the growth of nonbank mortgage servicers as an issue that required heightened attention and recommended that state and federal mortgage servicer regulators work together to increase oversight over this industry. In response, the Conference of State Bank Supervisors (CSBS) recommended prudential standards for nonbank mortgage servicers.

In 2020, CSBS proposed updated prudential standards for nonbank mortgage servicers[77] that included a multipronged approach with heightened standards for complex mortgage servicers and requested public comments. Among other standards, the proposal would impose stress testing requirements on complex mortgage servicers.

As state regulators update and finalize their prudential standards for nonbank mortgage servicers, they should consider the climate risk exposure of the mortgage market and integrate climate change criteria into their supervision of this industry.

REINSTATE AND REINFORCE THE FREEDOM OF INVESTORS TO ADDRESS CLIMATE CHANGE RISKS

> "Shareholders are beginning to accomplish on climate change what they have accomplished on numerous other significant issues crucial to good governance and long-term value—focus management attention and drive valuable and needed change. The Commission should be encouraging this kind of engagement, not stifling it."
>
> **Allison Herren Lee** Acting Chair, Securities and Exchange Commission, September 2020[78]

Addressing Climate as a Systemic Risk highlighted the key role that financial regulators can play in supporting investor efforts to integrate climate change into their investment decision-making.

The Securities and Exchange Commission and Department of Labor, through their policies and regulations, have important roles in influencing how investors can consider climate change in day-to-day decision-making. Many of the tools that investors have long relied on to consider climate factors in their investment holdings were stripped away in the fall of 2020 under the Trump administration.

Relevant regulators, including the SEC and Department of Labor, should act immediately to reinstate the right of investors to engage on climate change using all the tools at their disposal. This could include issuing new rulemaking or amending existing rules that place limits on investor rights.

Shareholder proxy proposals and proxy voting are invaluable tools that investors have used for many years to engage with companies and their boards on their handling of climate issues. Investors filed more than 140 climate-related shareholders proposals[79] with companies last year, with a record six resolutions earning majority voting support. Yet, despite the widespread use of shareholder proxies, the SEC and Department of Labor (DOL) both took aggressive steps last fall to limit investors' ability to use them.

In September 2020, the SEC finalized amendments to Rule 14a-8, increasing share ownership requirements[80] for filing proxy proposals. Per the SEC's own analysis, the rule will make three-quarters of investors in 99% of the S&P 500 ineligible to file resolutions.[81] The proposed rule attracted 14,000 comments, including from Ceres.[82] The overwhelming majority of the comments were from investors opposing it.[83]

The DOL has also taken similar steps to stifle investors' ability to consider climate and broader ESG issues. Last October, it announced Rule 1210-AB95, which limits how fund managers can consider climate and ESG factors[84] when making decisions on 401-Ks and other retirement plans covered by the Employee Retirement Income Security Act (ERISA). The rule specifically inhibits ERISA plans–with collective assets totaling over $15 trillion–from considering ESG factors as part of their due diligence. Of the more than 8,000 comments submitted by asset managers, investment advisers and groups like Ceres,[85] over 90% opposed the proposed change.[86] In March 2021, the DOL stated that it would not enforce this rule.[87]

MANDATE CLIMATE CHANGE DISCLOSURE

"Current voluntary disclosure practices are an important first step, but they are prone to variable quality, incompleteness, and a lack of actionable data. Ultimately, moving toward standardized, reliable, and mandatory disclosures could provide better access to the data required to appropriately manage risks."

Governor Lael Brainard Federal Reserve Board of Governors, February 2021[88]

Given the systemic nature of climate risks to financial markets and investors, our economy needs robust, comparable and reliable information at scale to assess risks and make informed decisions, whether at the issuer, portfolio or regulator level. **Addressing Climate as a Systemic Risk** called on the Securities and Exchange Commission to issue rules mandating the climate change disclosure building on the framework provided by the Task Force on Climate-related Financial Disclosures (TCFD).

The SEC should issue an Advance Notice of Proposed Rulemaking inviting public comments on the scope and focus of mandatory climate change disclosure rules.

Other federal financial regulators should coordinate with the SEC and identify opportunities to get additional climate change disclosures from industries that they supervise.

An October 2020 survey of nearly 3,000 investment professionals found that, while 40% of investment professionals factor climate risks into decision-making, about half said that they currently lack climate-related disclosures that they need.[89]

This is borne out by research:

- The TCFD's 2020 status report points to various shortcomings in corporate climate change disclosures,[90] including disclosures being provided mostly in unregulated and unverified voluntary disclosures. Only one in 15 companies disclosed information on their resilience to climate scenarios, including a 2°C or lower scenario. North American companies significantly trailed European companies in reporting rates on 10 of the 11 recommended disclosure categories and trailed Asia-Pacific companies on nine of 11.
- An analysis of the 10-K disclosures of the Russell 3000 companies found that, while 60% provided some basic climate change disclosures, the largest volumes of information are skewed heavily toward a few industries [91] (including electric utilities, oil and gas and mining) and are focused on transition risks. By contrast, there is much less disclosure around the physical risks of climate change.
- A July report by the National Whistleblowers Center, a nonprofit legal organization that works with whistleblowers, points to the potential for intentional underreporting[92] of climate change exposures, particularly in financial reporting by fossil fuel industries at risk.

The preponderance of research on the inadequacy of climate change disclosures has led to a continued call for mandatory disclosure.[93] Climate change reports issued last summer by the U.S. House of Representatives Select Committee on the Climate Crisis and the U.S. Senate Democratic Special Committee on the Climate Crisis reiterated the importance of rules for climate change disclosure.[94] The CFTC's report on climate change includes detailed recommendations on the importance of climate change disclosure mandates[95] for federal and state financial regulators. The Federal Reserve's biennial report on financial stability noted that "increased transparency through improved measurement and disclosure could improve the pricing of climate risks,[96] such as an increase in the frequency and severity of extreme weather events, thereby reducing the probability of sudden changes in asset prices."

The SEC took important steps in this direction. In February 2021, Acting Chair Lee issued a statement directing SEC staff to enhance their focus on climate-related disclosure.[97] The statement also referenced the need to eventually establish a climate change disclosure framework. In early March 2021, the SEC created a climate and ESG Task Force in the Division of Enforcement.[98] This divisionwide effort will have 22 members drawn from the SEC's headquarters, regional offices and Enforcement specialized units. In March 2021, the SEC welcomed public input on 15 questions that staff would consider in evaluating the need for climate change disclosure rules.

In the meantime, a number of groups have issued reports and recommendations pertaining to what such a framework should include. The Center for American Progress has called on the SEC to: "Require public company climate-related disclosures and analysis,[99] including disclosures of direct and indirect greenhouse gas (GHG) emissions and a range of climate-related risks; require companies to develop transition plans, targets, and sectoral adjustment strategies; and close the loopholes that allow larger companies to avoid public market transparency." A report by the Center for Global Financial Markets at Duke University calls for the SEC to address climate risks that the financial sector may face[100] both from direct holdings, and from the sector writ large. They also call for financial industry disclosure of assets in "high-impact sectors" as well as impact analyses based on financed emissions. In testimony provided to the House Financial Services Committee, Ceres called for rules on climate change disclosure[101] that are built on the recommendations of the TCFD.

The SEC should consider these and other recommendations on climate change disclosure by establishing an ESG advisory committee, as recommended by Commissioners Lee and Crenshaw.[102]

Outside the U.S., we have seen a strong uptick in rules for improved climate change disclosure. The governments of New Zealand[103] and the U.K.[104] have announced they will require companies and investors to disclose their climate change performance, using recommendations from the TFCD.

In January 2021, Switzerland became an official supporter of the TCFD[105] and the Swiss Federal Council announced that a bill to make the TCFD binding on companies would be drafted later in the year. Also in January 2021, the Korean Financial Services Commission announced plans for the Korean stock exchange to require disclosure from all listed companies.[106]

In January 2021, the central bank of France issued a study pointing to the connection between climate disclosure and climate performance. The study showed that investors subject to the country's mandatory climate change disclosure law curtailed their investments in fossil fuel companies by 40%[107] compared to their peers who were not subject to such requirements.

To supplement climate change disclosure rules, the SEC should work with the Financial Accounting Standards Board (FASB) to create more clarity on how climate change disclosures could be incorporated into financial statements.

In September 2020, investors representing over $100 trillion in assets under management called on companies to factor climate risks in profit and loss statements and balance sheets,[108] in line with International Accounting Standards Board (IASB) guidance on accounting for climate risks. The groups called for auditors to only sign off on financial statements consistent with the IASB guidance, and for companies to make assumptions in preparing financial statements that are compatible with the Paris climate accord.

In September 2020, the International Financial Reporting Standards (IFRS) Foundation requested comments on its proposal to establish a sustainability standards board[109] to develop a global sustainability standard, with an initial focus on climate change. As of January 2021, the Foundation received more than 500 comments, many of them, including from Ceres,[110] supportive of the proposal. One hundred and twenty countries globally use the IFRS Standards as the foundation for company financial disclosure. Should the IFRS move forward with creating a new standard, it will likely be taken up globally. While the U.S. does not use IFRS standards, the U.S. GAAP stays in close coordination with its global counterpart.

To enhance market confidence in the reliability of climate change data, the SEC should direct the PCAOB to issue guidance to public company auditors on how they should assess the adequacy of climate change disclosures.

Additionally, we have seen calls for the Public Company Accounting Oversight Board (PCAOB) to provide guidance on how ESG issues like climate change could be surfaced by auditors as a part of discussions on "critical audit matters."[111] Such action is critical to addressing investor concerns relating to the reliability of climate and ESG disclosures.

In March 2021, the Center for American Progress issued recommendations for the SEC and PCAOB to consider in order to enhance the accounting and auditing process to communicate reliable climate information[112] to investors and the market, including:

- Enforcing existing accounting and related disclosure requirements to reflect risks associated with the climate crisis and the energy transition to the full extent.
- Updating disclosure, through guidance and rule-making, to spread identified best practices about material climate-related information across industries and markets.
- Leveraging the audit to build a solid bridge between climate-related disclosures and corporate financial reporting.
- Expanding Generally Accepted Accounting Principles to address systemic risks.

The SEC should work with the Municipal Securities Rulemaking Board to consider how climate change can affect the credit quality of municipal bonds and issue guidance on needed disclosures in the market.

In addition to public company disclosure, there is a growing focus on the need for climate disclosure from other exposed asset classes –including the issuers of municipal securities. A 2019 report from BlackRock noted that "extreme weather events pose growing risks for the creditworthiness of state and local issuers[113] in the $3.8 trillion U.S. municipal bond market."An earlier report by Four Twenty Seven reached a similar conclusion, saying: "climate change will pose challenges to several economically important U.S. municipalities,[114] especially those that are both highly exposed and financially vulnerable."

Despite these risks, municipal bond disclosures still largely ignore climate[115] risks, according to a Brookings Institute report issued last fall. "Looking at large samples of the official statements released with new municipal debt issuances, we find no relationship between objective measures of which municipalities are most exposed to climate impacts and what they disclose to the markets," the report concluded, noting that only 3.8% of general obligation bonds refer to climate risks in their prospectuses.

The CFTC climate report includes recommendations calling on municipal securities regulators to examine the quality and adequacy of climate related disclosures in municipal bonds official statements and continuing disclosures. Building on this, in January 2021, Ceres called on the Municipal Securities Rulemaking Board[116] to:

(i) Establish a task force of internal staff and external individuals to develop a detailed plan to address the risks of climate change to the municipal marketplace and institute a multifaceted plan to address this risk. (ii) Prepare annual reports on climate risks for the municipal bond marketplace, including an analysis of data from Electronic Municipal Market Access (EMMA) database and the actions taken and trainings offered. (iii) Develop a climate disclosure pilot initiative while the broader rules are being resolved. (iv) Expand the online educational offerings to include information on the growing risk from climate change.[117]

INCLUDE CLIMATE CHANGE IN PANDEMIC RECOVERY RESPONSES

"COVID-19, however dreadful in itself, provides us with a unique opportunity to regain the lost ground in the battle against climate change and biodiversity loss. Governments worldwide are investing trillions of euro to help our economies recover from the COVID-19 crisis. Let those trillions be green trillions."

Frank Elderson Executive Director of Supervision of the Netherlands Bank, December 2020[118]

The critical role of U.S. financial regulators, particularly the Federal Reserve System, to keep our economy strong and resilient in the face of severe economic headwinds was clearly evident during the pandemic. During 2020, the Federal Reserve rolled out a panoply of efforts to stabilize the economy.[119] However, these efforts were aimed at supporting all sectors of the economy and did not expressly consider climate change impacts. Rather than standing back, financial regulators should seize the opportunity in this moment of potential economic transformation to develop a playbook for broad, long-lasting climate action.

U.S. financial regulators—in particular, the Federal Reserve—should more proactively link financial recovery efforts with climate resiliency. Additionally, financial regulators and the U.S. Department of Treasury should expressly consider climate change outcomes as a part of pandemic recovery measures.

Research indicates that the Federal Reserve's emergency measures in the wake of the pandemic shored up the fossil fuel sector, which was in sharp decline before the Fed's intervention.

- Last June, the Federal Reserve updated the terms of its Main Street Lending Program by agreeing to buy up 95% of new corporate debt provided by banks to companies, many of them to struggling, heavily-indebted oil and gas businesses.[120]
- The first tranche of the Fed's corporate bond purchases included just under $100 million of bonds for fossil fuel-related companies,[121] including $22 million of non-investment grade "junk" bonds, according to data analysis firm Influence Map.
- An analysis of the Fed's corporate bond purchases through August 2020 showed that they were significantly overweighted toward oil and gas and coal value chain companies[122]—by a factor of two, based on outstanding corporate debt, and by a factor of 3.5, based on market values.
- A September 2020 report published by Friends of the Earth, Public Citizen and Bailout Watch identified nearly $100 billion of bonds sold by oil and gas companies[123] since the Federal Reserve launched its recovery program. The amount included more than $60 billion of new bond debt from 19 oil and gas companies; 12 of those companies had seen downgrades in their debt, credit or default ratings since March 2020.

The Federal Reserve's lending to the fossil fuel sector likely stems from the principle of "market neutrality," which simply means not favoring one industry over another. However, the market itself is heavily weighted towards the fossil fuel industry—largely because of the significant issuance of bonds, including junk bonds--by the energy sector. Without taking this into account, and by applying this principle without considering the risk exposure of key sectors, the Federal Reserve is perpetuating systemic climate risks. Decisions on corporate bond purchases should also reflect the Fed's overarching mandate to protect the safety and soundness of markets and the economy writ large.

As former Federal Reserve Board Governor Sarah Bloom Raskin[124] wrote last year: "Climate change threatens financial stability; addressing it can create economic opportunity and more jobs. The decisions the Federal Reserve makes on our behalf should build toward a stronger economy with more jobs in innovative industries—not prop up and enrich dying ones."

Options for the Federal Reserve to integrate climate change into pandemic recovery

- Exclude assets significantly exposed to climate risks.[125] For instance, Sweden's Riksbank sold off bonds[126] from the Canadian province of Alberta and the Australian states of Queensland and Western Australia as their greenhouse gas emissions were too high.
- Attach climate change conditions on loans made to companies as part of emergency relief. As noted earlier, Canada is requiring large companies accepting loans as part of the government's relief support to disclose their climate change performance.
- Engage in "responsible" quantitative easing that factors in climate considerations.[127] For instance, ECB President Christine Lagarde signaled last summer that the ECB's € 2.8 trillion asset purchase scheme could be deployed following green policy objectives,[128] making the ECB the first central bank to integrate green objectives in its quantitative easing program. One way for the Federal Reserve to do this is by more selectively purchasing corporate debt from companies that have emissions aligned with the Paris climate goals or have set targets in line with climate science—as more than 1,000 companies have done with the Science Based Targets initiative.[129]
- Tilt the financial playing field towards low carbon options as a part of its efforts to infuse more capital into the economy. For instance, in December 2019 the Hungarian Central Bank offered preferential capital treatment to energy efficient housing loans.[130]

INTEGRATE CLIMATE CHANGE RESILIENCE AND RACIAL EQUITY INTO DISCUSSIONS ON FINANCIAL STABILITY

The last 10 months have showcased a powerful truth: issues like climate change, public health and racial inequality do not exist in silos, but are deeply interconnected and affect financial markets and broader economic well-being. It is critical to directly address the disproportionate effect of climate change on minority communities in order to equip them to more fully participate in the economy.

This awareness has led to a growing focus on the role of the Federal Reserve and other financial regulators in tackling racial and economic disparities as part of their overarching mission to ensure financial stability, economic resiliency and full employment,[131] in addition to discussions on the Fed's role in addressing climate change.

The Federal Reserve should work with other banking regulators to develop approaches to financial stability that address the systemic crises of climate change and racial inequity in an integrated manner. The Community Reinvestment Act offers such an opportunity.

In August, Congressional Democrats introduced the Federal Reserve Racial and Economic Equity Act,[132] which would require the Federal Reserve to take action "to minimize and eliminate racial disparities in employment, wages, wealth and access to affordable credit." During his campaign, President Biden called for an amendment to the Federal Reserve Act requiring the Federal Reserve to report on racial economic gaps and policies it is implementing to close those gaps.[133]

These actions were followed by statements and speeches from several Regional Federal Reserve Bank presidents, including from Atlanta[134] and San Francisco[135] on the role the Federal Reserve can play in fostering a more equitable and inclusive financial system. The Federal Reserves of Boston, Atlanta and Minneapolis also held a series of joint virtual events[136] last fall entitled "Racism and the Economy," important first steps in examining and advancing potential Federal Reserve action to dismantle structural racism. **Addressing Climate as a Systemic Risk** highlighted the importance of the Community Reinvestment Act (CRA) process in driving solutions that can enhance financial access, economic prosperity and broader climate and economic resilience for low-income and vulnerable communities. The CRA was enacted in 1977 to combat redlining, the practice of systematically denying mortgage and other financial services to communities based on their racial makeup.

In October 2020, the Federal Reserve invited public comment on possible approaches for modernizing regulations for implementing the CRA.[137] Key focus areas include financial inclusion to ensure that banks are meeting the needs of low- and moderate-income communities and addressing credit inequities.

In February 2021, Ceres submitted a number of recommendations [138] to the Federal Reserve about integrating climate change into the CRA process, including:

- Explicitly targeting low-income communities and communities of color to boost their climate resilience.
- Explicitly including race and climate factors on CRA exams.
- Assigning additional weights to climate resilience efforts in vulnerable communities.
- Offering an illustrative list of climate change resilience projects that can be financed for CRA credit. For instance, in February 2021 the New York DFS issued an industry letter that identified specific examples of financing activities that support climate resiliency.[139]
- Developing guidance on how climate change resilience could be integrated into impact scores.
- Collecting community level climate resilience data.
- Recruiting staff and engaging stakeholders with expertise in climate change resilience.
- Avoiding unintended consequences associated with CRA modernization, including by integrating climate resilience.

STRENGTHEN FINANCIAL REGULATOR COORDINATION DOMESTICALLY AND GLOBALLY

Coordinated action by U.S. financial regulators at the federal and state levels and with global financial regulators is essential to accelerating climate risk mitigation and low-carbon capital flows.

As part of the Department of Treasury, the Financial Stability Oversight Council should immediately declare climate change as a threat to financial stability, and begin the process of engaging with its members to develop a coordinated approach for federal financial regulators to address climate change. Areas of coordination include prudential oversight and climate change disclosures.

The Financial Stability Oversight Council plays a critical coordination role among federal financial regulators and should immediately declare an explicit focus on the climate crisis. As a first step, the council could charter a "climate committee" comprised of relevant member regulators to drive climate action across the regulatory ecosystem.

During her Senate confirmation hearings, Treasury Secretary Janet Yellen pledged to create a Treasury "hub" that would examine financial system risks arising from climate change.[140] This hub could coordinate with the FSOC and Office of Financial Research on the needed research on climate-related impacts on market stability. It could also support council members in driving needed coordination and action. In fact, we are already seeing calls for such action.[141] Groups, including Ceres, have called on Secretary Yellen to appoint a climate champion to lead this effort, noting, "Deliberate, organized, and coordinated action[142] from the market and banking regulators is especially urgent as the U.S. has fallen behind."

The Addressing Climate Financial Risk Act introduced in March 2021 calls on the FSOC to establish an advisory committee[143] on climate financial risk and ensure domestic and global coordination in addressing climate risks. The Federal Reserve's newly announced Financial Stability Climate Committee is intended to work with the FSOC[144] and its member agencies to promote the resilience of the financial system writ large to climate risks. In March 2021, Secretary Yellen identified climate change as one of the priorities of the FSOC going forward.

State financial regulators should more aggressively act to affirm that climate change is a financial risk and implement specific response measures.

Federal regulators should coordinate with state regulators to ensure that learnings and guidance that are being developed at the federal level are also being adapted to the needs of state regulatory bodies.

As noted earlier in the report, in the last 10 months we have seen leadership action from key state regulators, such as the New York Department of Financial Services.

In addition:

- California Insurance Commissioner Ricardo Lara launched the Climate Smart Insurance Products Database,[145] the first-ever consumer-oriented list of green insurance policies.
- Washington state Insurance Commissioner Mike Kreidler hosted the Climate Summit 2020[146] to highlight current climate science, private sector best practices and regulatory environments related to climate change, bringing together a national audience of climate, government and insurance professionals.

As a result of heightened expectations on disclosure from the insurance commissions from Washington, California, Connecticut, Minnesota, New Mexico, and New York, eight insurance companies filed TCFD[147] (Task Force on Climate-related Financial Disclosures) reports in response to the National Association of Insurance Commissioners (NAIC) Climate Risk Disclosure Survey in 2020.

Several other state financial regulators have started research into climate change in their respective states. For instance, in July, the NAIC formed its Climate & Resiliency Task Force,[148] which is coordinating the NAIC's domestic and international efforts on climate risk and resiliency issues, including dialogues among regulators and the industry. In November, the NAIC published a report examining the breadth and quality of climate disclosures by insurance companies[149] and where improvements are needed. As of March 2021, they are actively working on a review of the climate disclosure protocols.

To support such efforts, the Federal Insurance Office (FIO) should review and issue a report on the extent to which state insurance supervisors integrate climate change into their supervisory practices.

Financial regulators should find opportunities to engage and coordinate with their global peers to build on lessons learned and experiences to date, as well as develop a shared global playbook for action.

There are a growing number of forums for global regulators to collaborate to address climate change issues.

Having joined the NGFS in December 2020, the Federal Reserve is well positioned to coordinate with other global central banks on issues such as climate stress testing scenarios, which could ease compliance burdens on financial institutions. Membership in the NGFS has grown from 66 in June 2020 to 87 members in March 2021.[150] Other regulators could also consider joining the NGFS also.

Membership in the Sustainable Insurance Forum (SIF), the international network of insurance supervisors developing best regulatory practices to address climate risk in the insurance sector, has grown from 10 members in late 2016 to 30 members in March 2021 (collectively regulating 92% of the global insurance market). As of March 2021, the NAIC and state insurance regulators from New York, Washington and California are members[151] of SIF, and other state insurance regulators could also consider joining.

Another encouraging sign is the Fed's leadership role on the newly formed Task Force on Climate-Related Risks, which is part of the Basel Committee on Banking Supervision.[152] The Basel Committee is the primary global standard setter for the prudential regulation of banks and a key forum for cooperation on bank supervisory matters. Similarly, U.S. regulators could raise climate change in other global regulatory coordination bodies, such as the International Association of Insurance Supervisors and IOSCO.

PRIORITIZE CLIMATE COMPETENCE AND ENHANCE INTERNAL CAPACITY

Implementing effective regulatory and supervisory responses to systemic climate risks requires a solid understanding of climate change and its cascading effects throughout the financial system. Key leadership and senior staff appointments to various financial regulatory bodies should reflect these perspectives and skill sets. Continued efforts to enhance internal capacity and knowledge sharing should also be prioritized.

Financial Regulators should engage external stakeholders, including academics, to deepen their understanding on how climate change impacts their area of focus.

In just the past 10 months, we've seen many research conferences organized by financial regulators about climate impacts on financial markets.

- Regional banks at the Federal Reserve, including Chicago,[153] Richmond[154] and San Francisco,[155] continue to lead these efforts.
- The Federal Housing Finance Agency has held listening sessions[156] and organized a virtual national conference focused on weather disruptions to U.S. mortgages.[157]

Regulators are also looking to external experts and advisory groups to develop recommendations on the issue. Among the most prominent examples is the climate change subcommittee of the CFTC's Market Risk Advisory Committee's sweeping climate risk report.[158] The subcommittee included 34 diverse representatives from industry, academia and NGOs, including Ceres President and CEO Mindy Lubber.

In December, the SEC's Asset Management Advisory Committee set up an ESG subcommittee focused on ESG issues,[159] including climate change and climate disclosure, in order to create better transparency for investors.

The Working Group on Climate Change and Finance, co-chaired by Mark Carney and Janet Yellen, produced a report last fall that calls for the creation of independent "carbon councils,"[160] which can help design financial instruments to help governments reach net-zero carbon economy goals.

We're also seeing the potential of formal partnerships between agencies. One such example is the signing of an MOU last fall by the NY Department of Financial Services and the New York Energy Research and Development Authority[161] to coordinate their climate-related responses. Financial regulators could consider similar partnerships with agencies, such as the Environmental Protection Agency, the National Oceanic and Atmospheric Administration, FEMA, the FHA and others.

The NGFS is drawing on the work of academics and other experts on climate risk and financial supervision, including research and academic papers commissioned by the International Network for Sustainable Financial Policy Insights, Research and Exchange.[162]

Financial regulators should build up their internal capacity through hiring and training to be able to engage on climate change in an informed manner.

Financial regulators are also hiring more staff with climate and ESG expertise. In February 2021, the SEC announced the hiring of Satyam Khanna with the mandate to coordinate within the agency[163] on climate change and ESG. As noted earlier, in January 2021, the Federal Reserve set up a climate supervision committee[164] led by former EVP of the New York Federal Reserve Kevin Stiroh with the express mandate to deepen their own understanding of climate change.

Better training is another pressing issue,[165] as highlighted by a Government Accountability Office (GAO) report focused on the SEC. Given the role that financial regulators play in supervising banks and insurance companies, the fluency of financial examiners to understand climate impacts on the industries they supervise is very important. Banking regulators such as the Fed, FDIC and OCC have systems in place to train bank examiners, but they need to be updated to reflect growing climate risks. State bank regulators also need to address their vital role in training bank examiners to understand climate risks in their bank reviews.

Finally, within the context of the NGFS, there is a growing focus on having central banks "walk the talk," by integrating ESG considerations and climate change into the management of their own portfolios. For the past two years, the NGFS has been conducting surveys on the extent to which central banks are starting to integrate ESG and climate considerations into the management of their own portfolio. The 2020 progress report[166] shows a small increase in central banks implementing this practice. In February 2021, the ECB and 19 central banks in the European Union announced that they would start to disclose the climate performance of their own investment portfolios[167] through annual reports using the TCFD framework. The Federal Reserve and other agencies could explore similar steps for the U.S.

CONCLUSION

The signals are impossible to miss. Global temperatures are rising and the destructive impacts are accelerating. We have less than 10 years to reverse course. We have a new U.S. president and a new administration committed to a new path—a net-zero carbon economic future.

Given the profound risks—and the massive opportunities—U.S. financial regulators must play a critical role in bolstering our economy, weakened from a global pandemic and threatened by future climate shocks. Financial regulators in countries around the globe have shown leadership in this work. Rather than standing back, U.S. regulators should seize the vast opportunity of a sweeping economic transformation that can stabilize our climate while reducing long-standing social and economic inequalities.

It won't be easy, of course. Unlike the foreseeable resolution to the COVID-19 pandemic, we do not have vaccines to protect against climate risks. Broader, deeper structural changes in our economy will be needed to bring climate change to its knees. But the good news is we already have all the tools and knowledge in the financial markets, both domestically and from our engaged global peers, to take ambitious action commensurate with the latest climate science.

Climate change presents profound risks to our present and our future—unless regulators act boldly, today.

APPENDIX: CLIMATE IMPACTS

CLIMATE IMPACTS ON FINANCIAL MARKETS ARE GROWING

Our earlier report, **Addressing Climate as a Systemic Risk,** highlighted how climate change and its cascading ripples—the physical risks to real assets due to climate-fueled weather events, the transition risks posed by regulatory, technological or investor sentiment changes during a shift to a low-carbon economy and other socio-economic shifts—are creating profound long-term risks for financial markets and the economy. It also described how each of these trends are interconnected and growing, creating even larger threats to market stability.

The evidence that these climate risks are already having a significant impact on financial markets ratcheted up during the past nine months. Climate related risks and opportunities are already leading to shifts in corporate strategies and investment flows. These powerful shifts will only grow stronger as the Biden administration joins other governments around the world in embracing bolder climate agendas.

And despite efforts to cast financial regulator action on climate change as a "special interest issue,"[168] the evidence clearly demonstrates that climate risk is a material financial risk, the scale of which poses threats to financial market stability.

PHYSICAL IMPACTS OF CLIMATE CHANGE ARE WORSENING

From melting glaciers to stronger hurricanes to charred forests, the physical impacts of climate change are worsening. With global temperatures[169] hitting record highs, extreme weather events, including wildfires, hurricanes and heatwaves, are stronger and more destructive. Shifts in weather and climate patterns are escalating, jeopardizing water supplies and agricultural production.

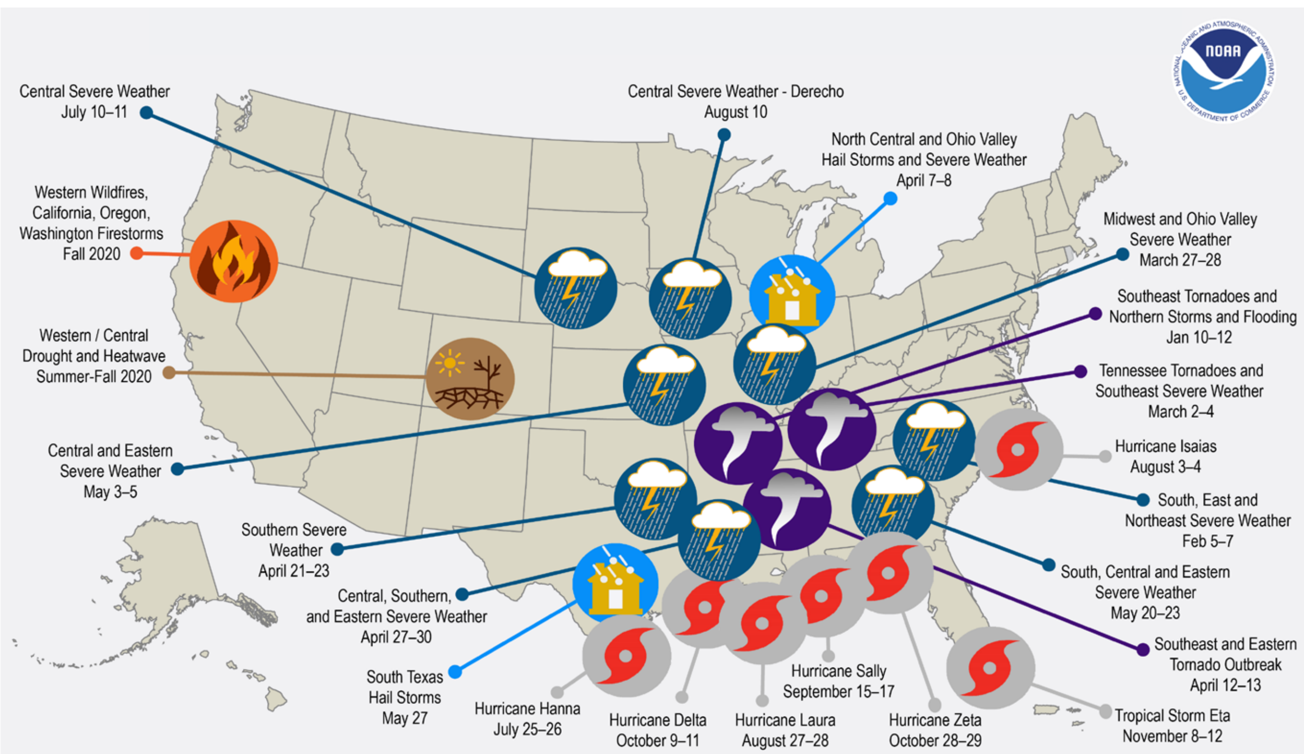
In just the past 10 months:

- California experienced its worst wildfire season[170] on record, burning over four million acres, double the previous 2018 record, and leading to $150 billion in damages. Widespread evacuations, power outages and business disruptions are becoming the new normal in the Golden State. Colorado, Washington and Oregon also experienced record wildfires.
- Texas, Florida and other Southeast states were pummeled by the busiest hurricane season on record,[171] with 30 named storms[172] and a dozen landfall storms. Lake Charles, Louisiana experienced back-to-back hurricanes[173]—the first with 150 mph winds, the second with over 15 inches of rain.
- In February 2021, a devastating winter storm in Texas[174] left thousands of people without power and millions without access to safe water, exposing weaknesses in the state's infrastructure.

Overall, the U.S. endured an unprecedented 22 billion dollar disasters[175] in 2020, shattering the previous record of 16 in 2011 and 2017. Combined damages[176] totaled $95 billion,[177] nearly double the amount in 2019. While wildfires and hurricanes garner most of the headlines, every region in the country is being affected by climate change. The Southwest, the country's fastest growing region, experienced unrelenting record heat. While California's Death Valley hit an astonishing 129.9 degrees Fahrenheit on August 16, mercury readings in Phoenix eclipsed 100 degrees on a record 144 days.[178] The Midwest, which accounts for nearly half of all farm income in the U.S., was pummeled by ferocious thunderstorms[179] that caused $6.8 billion in losses and damaged millions of acres of corn and soybeans in Iowa. The Southeast, which is being swamped by rising sea levels, saw record levels of tidal flooding[180] in Charleston, Savannah and Miami—trends that are already triggering higher insurance premiums and declining property values.[181] In fact, a January 2021 report from Stanford notes that the intensifying precipitation caused by climate change contributed one-third of the financial costs of flooding[182] in the U.S. over the past three decades, totaling almost $75 billion of the estimated $199 billion in flood damages from 1988 to 2017.

These risks are projected to get even worse. A December 2020 report by Four Twenty Seven, a division of Moody's that assesses climate risks for financial markets, paints a sobering picture of what lies ahead.[183] It identifies the U.S. as the third most exposed country to climate risks, behind China and the Philippines, by 2040. "Every single county (in the United States) has some sort of climate threat that's either emerged and is doing some damage right now or is going to emerge," said Nik Steinberg, the report's lead author.

Map of the United States plotted with the dates and approximate locations for the record-breaking 22 billion dollar weather and climage disasters that impacted the country in 2020. (Credit: NOAA NCEI) [184]



CLIMATE POLICY MEASURES ARE GAINING MOMENTUM

During the past nine months, government policies and legislative actions to reduce greenhouse gas emissions gained momentum.

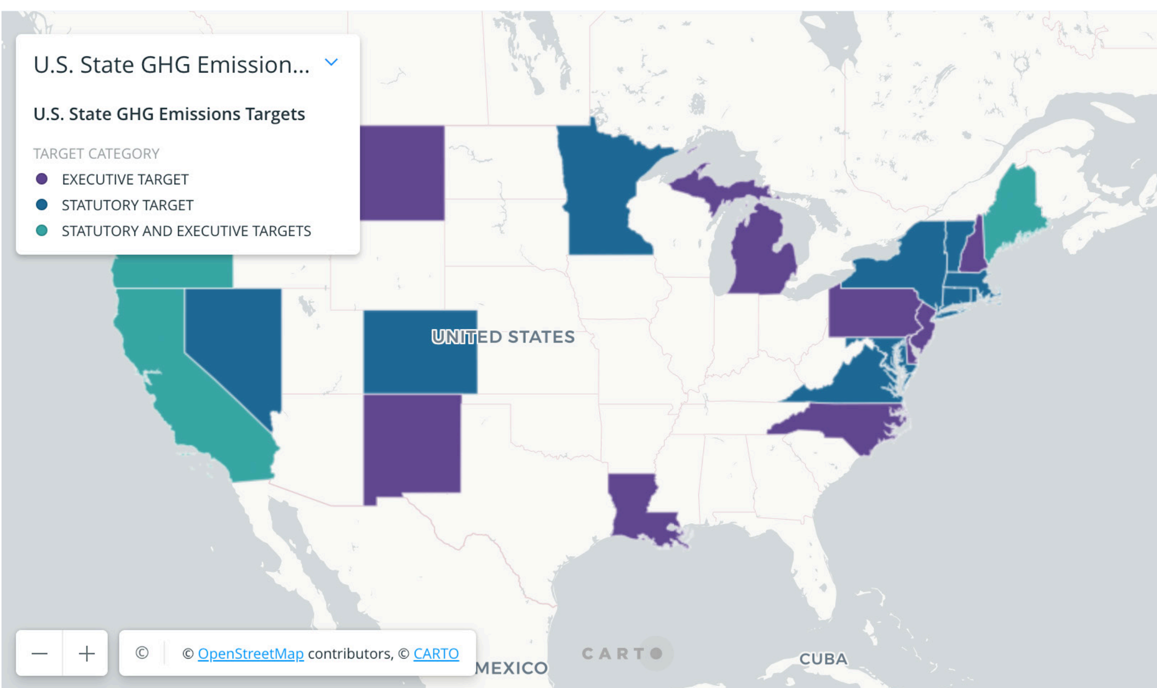
Most noteworthy, the United States rejoined the Paris Agreement[185] on climate change. This means a renewal of the U.S. pledge to meet its Nationally Determined Commitment (NDC) of achieving a 26 - 28% reduction in greenhouse gas emissions below 2005 levels by 2025, as well as setting a new and more strengthened target to 2030.[186] Despite the fall in emissions in 2020 on account of the depressed economic activity precipitated by the coronavirus pandemic, the U.S. is still not on track[187] to meet this commitment.

The Biden administration has made several ambitious commitments[188] to reverse this trend, including moving the U.S. economy to net-zero emissions no later than 2050, achieving 100% clean energy by 2035 and creating 10 million new jobs. Should these policies be implemented, major industries across the economy would need to make significant changes to their operations, investments and strategies to meet these goals.

In the meantime, we continue to see more momentum from U.S. states and cities, which has led to changes from businesses and industries operating in their jurisdictions. Already, one in three Americans live in places targeting 100% clean energy.[189] California, the world's fifth largest economy, already gets two-thirds of its electricity from renewables,[190] such as wind and solar. States are also lowering their carbon footprints in more targeted ways. During the summer of 2020, 15 states pledged to work collectively[191] to decarbonize commercial vehicles by 2030.

More than 450 U.S. city mayors have made pledges to address climate change.[192] While there is more to be done regarding the rigor of these commitments, 45 major cities representing 12% of the country's population have fully developed GHG reduction targets, most of them generally aligned with a pathway of 80% mitigation by 2050 that is consistent with the Paris Agreement, according to a recent Brookings Institution report.[193]

US State GHG Emissions Targets (Credit: C2ES) [194]



LIABILITY EXPOSURE FROM CLIMATE CHANGE IS GROWING

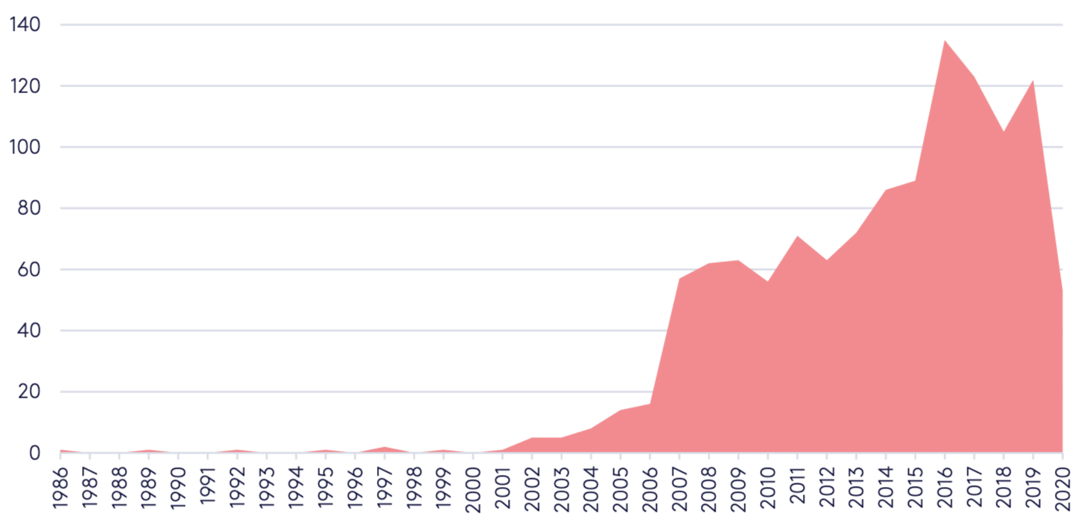
Climate litigation and liability exposure are also growing, creating larger financial risks for governments, companies, financial institutions and corporate directors. As of March 2021, over 1,300 cases and administrative proceedings[195] related to climate change are ongoing in the US.

Nearly three dozen lawsuits are currently ongoing[196] against U.S. fossil fuel companies. These include:

- Liability suits filed by states and local governments
- Disclosure-related claims building on the theory that companies defrauded shareholders by misrepresenting climate impacts on their businesses
- Human rights-related claims

Global trends in climate change litigation: 2020 snapshot.

Setzer J and Byrnes R (2020)[200] London: Grantham Research Institute on Climate Change and the Environment and Centre for Climate Change Economics and Policy, London School of Economics and Political Science.



Importantly, there is a growing body of research documenting the risk of financial fraud in the sector, signaling a likelihood of increased securities enforcement action and litigation. A recent report found that fossil fuel companies routinely omitted information[197] from companies' statements to shareholders that would flag the risks that climate change poses to the companies' financial condition, along with risks of asset deflation that would contribute to an "economy-wide financial implosion." In January 2021, the SEC launched an investigation into Exxon's valuation of its assets "in the face of the current plunge in oil prices—and how it estimates their future worth in a world of increasing climate change regulations."[198]

As climate attribution science, the science connecting climate change to damaging events, improves, [199] potential liability exposure for companies will likely increase. In *Juliana v. United States*, the 9th Circuit Court of Appeals upheld the notion that federal policy failing to control fossil fuel development[201] contributed to climate change. The court cited the United States' historical and current contribution to global emissions and evidence submitted by the plaintiffs that federal subsidies and leases had increased those emissions.

There is also a growing clarity on the liability exposure faced by corporate directors on the boards of companies that are not proactive on climate change. A September 2020 legal memorandum by the UN PRI concluded that "directors of U.S. corporations are obligated, rather than permitted, to take into account ESG factors in two circumstances:[202] when ESG factors implicate material legal compliance issues for the corporation, or when they present material risks or opportunities to the corporation."

Given the growing acceptance of material climate risks for many industries, we may see more litigation aimed at U.S. corporate directors for failing to discharge their fiduciary duties on this front.

Financial services companies and insurers also face liability risks in their capacity as investors. Plaintiffs in several jurisdictions have made claims against investment funds and companies for failing to incorporate climate risk into their decision-making,[203] and for failing to disclose climate risk to their beneficiaries.

LOW-CARBON INVESTMENTS ARE GROWING

We are seeing notable upticks in investment in the low-carbon transition. But these increases still are not sufficient to avoid a climate catastrophe without significant growth.

A September 2020 study noted achieving a net-zero carbon economy by 2050 will require $1 to $2 trillion a year of additional investments,[204] or 1 - 1.5% of the global gross domestic product, shifting the historic focus from fossil fuels towards renewable energy, energy efficiency and other clean technologies. This shift is underway and gaining strength.

Increased awareness on Wall Street of the risks associated with fossil fuel-based investments, combined with the growing competitiveness of renewable energy and electric vehicles, has led to broad and substantial gains in clean energy investing.

Notable indicators include:

- Solar farms and onshore wind are now the cheapest source of new electricity[205] for at least two-thirds of the world's population, including the United States, and will eventually be cheaper than running existing fossil fuel plants.[206]
- For many years, investment in new energy (electricity capacity) in renewables has outpaced[207] investments in fossil fuel based capacity and, even during the pandemic, renewables contracted significantly less.[208]
- Climate-oriented equity indexes outperformed[209] broader markets by 2 to 5% in 2020 as economic activity shifted away from travel and other fossil-fuel intensive sectors towards online commerce and clean technologies. In October 2020, NextEra Energy briefly passed ExxonMobil[210] to become the largest U.S. energy company in market capitalization. Tesla, which makes electric cars and storage batteries, is more valuable than Ford, General Motors and Fiat combined.[211]
- The green bond market continued its rapid growth[212] and is expected to eclipse $1 trillion in 2021. Companies and governments are expected to issue $500 billion in green debt[213] in 2021 alone. (While green bonds refer to any environmentally beneficial offering, they are often focused on climate mitigation.)
- Money managers and institutional investors continue to prioritize climate change. A November 2020 study of U.S. sustainable investing trends found that "climate change remains the most important specific ESG issue[214] considered by money managers in asset weighted terms," affecting $4.2 trillion in assets, up 39% from 2018. The study also found that for "institutional asset owners, insurance companies and retirement plan sponsors, climate change remains the most important environmental issue, at $2.6 trillion, a rise of 17% over 2018."

THE FOSSIL FUEL INDUSTRY IS STRUGGLING FINANCIALLY

The specter of certain fossil fuel assets becoming stranded, or essentially worthless, is becoming a bigger reality.

Fossil fuel assets have experienced severe losses on account of the protracted pandemic, although they have rebounded a bit the past several months. As global energy demand plummeted, crude oil futures collapsed[215] to as low as $10 a barrel. Major oil producers had no choice but to write down the value of their assets. ExxonMobil, BP, Royal Dutch Shell and other oil and gas firms all announced major write-downs[216] in 2020. In 2020's first nine months, cumulative losses totaled about $145 billion.[217]

ExxonMobil was hit especially hard. In fall 2020, it announced its third consecutive quarter of losses,[218] its lowest spending in 20 years and layoffs of 14,000 employees, or 15% of its global workforce.

The retraction was also felt on Wall Street. As climate-tilted indexes and stocks outperformed in 2020, oil and gas oriented funds dropped by 50%.[219] The weightage of energy stocks has dropped to a mere 2.3% of the benchmark S&P 500 from 16%[220] as recently as 12 years ago. While energy stocks have partially rebounded, this industry will likely continue to face impairment as clean energy grabs more market share in the coming years. In August 2020, Fitch Ratings raised its energy sector 2020 high-yield bond default forecast to 17%,[221] up from 7% in March 2020.

While the form and speed of this transition is unclear, far larger financial impacts are a distinct possibility as the world's largest economies, including the U.S., China, the EU and other governments, put in place ambitious programs to address climate change. One-third of the current value of large oil and gas companies is projected to be lost[222] if governments more aggressively attempt to limit average temperature rise to 1.5 degrees Celsius, as called for under the Paris Agreement. Even under a more benign 2-degree scenario, energy producers would have to write off over half of their fossil fuel reserves–making last year's oil and gas write downs look like a drop in the bucket.

BANKS AND INSURERS FACE GROWING RISKS FROM THIS TRANSITION

Banks and insurance companies which are heavily invested in carbon intensive industries face significant potential losses in their lending and investment portfolios.

A 2020 Ceres Accelerator report, **Financing a Net-Zero Economy: Measuring and Addressing Climate Risk for Banks**, found that more than half of syndicated loans by major U.S. banks[223] carry significant transition risk due to their loan clients' lack of preparation for a carbon-constrained world. It warned that, should investor and consumer sentiment shift, there could be substantial losses from banks' direct exposure to energy producing sectors and those relying on them, such as manufacturing, buildings, transportation and agriculture, which in combination could total as much as 18% of the syndicated loan portfolios of the largest banks. An updated analysis[224] published in February 2021 highlights the need for banks to take a longer view of risks in their loan portfolios.

Key findings of Ceres 2020 report Financing a Net-Zero Economy: Measuring and Addressing Climate Risk for Banks (Credit: Ceres)

In fact, many of these risks are already showing up on bank balance sheets. In July 2020, both Wells Fargo and JP Morgan reported significant losses due to their lending[225] to oil, gas and pipeline companies.

To be sure, financial institutions are taking early steps to improve their climate risk management. In September, Morgan Stanley announced a goal to get to "net-zero financed emissions"[226] by 2050. In October, JPMorgan Chase committed to set 2030 emissions targets[227] for all industries in its financing portfolio, aligned with the Paris climate goals. In 2021, Bank of America,[228] Citigroup[229] and Wells Fargo[230] outlined plans to achieve net-zero greenhouse gas (GHG) emissions in their financing activities before 2050. Meanwhile, Bank of America, Citi, Morgan Stanley and many others joined the Partnership for Carbon Accounting Financials (PCAF),[231]whose mission is to "work together to develop and implement a harmonized approach to assess and disclose the greenhouse gas (GHG) emissions associated with their loans and investments."

While these are welcome initial steps, the extent to which these actions will affect fossil fuel financing remains to be seen, as lending and investments to carbon intensive industries continue apace. A December 2020 report found that financial institutions provided $1.6 trillion in loans and underwriting since 2016 and, as of August 2020, invested $1.1 trillion in bonds and shares[232] in 133 companies driving 12 of the world's largest fossil fuel expansion projects, which have the potential to use up to three-quarters of the total remaining carbon budget if we are to have a chance of limiting global temperature rise to 1.5° Celsius. Among the biggest investors and banks were U.S.-based financial institutions, including Blackrock, State Street, Capital Group, Citigroup, Bank of America and JPMorgan.

CLIMATE IMPACTS ARE INTERCONNECTED AND AMPLIFY EACH OTHER

As we noted in **Addressing Climate as a Systemic Risk**, the various impacts that climate change has on financial markets—physical, socio-economic, transition—do not happen in isolation. While the impacts outlined above are significant, their cumulative, correlated and nonlinear nature create far greater risks to financial market stability. To put it simply, the whole is not only greater than the sum of its parts–it magnifies them, as well.

A September 2020 report from the U.S. Commodity Futures Trading Commission (CFTC) emphasizes the interconnected nature and propagation of climate impacts.[233] It highlights key climate-related characteristics exhibited in systemic risks, such as "shock amplification," the notion that a given shock to the financial system may be magnified and propagate more widely; "propagation" causes an impairment to all or major parts of the financial system; "impairment," in turn, causes spillover effects to the real economy.

A paper by the Federal Reserve Bank of Chicago draws lessons from the pandemic, pointing to the interconnectedness of global financial systems,[234] concentrations of global supply chains and compounded effects from irreversible changes. Regarding climate change, it warns: "Climate change not only affects each of the financial risk-management categories, in addition to operational risk, but also affects how these risks interact with each other and add up to generate systemic risk. We need a new framework, instead of the traditional separate financial, operational, and climate frameworks."

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