Decarbonize the Economy to Address Systemic Climate-Related Financial Risks

U.S. Senate Committee on Banking, Housing, and Urban Affairs Hearing on the 21st Century Economy: Protecting the Financial System from Risks Associated with Climate Change

March 18, 2021

Written Testimony by Marilyn Waite
Climate and Clean Energy Finance Program Officer
The William and Flora Hewlett Foundation

Table of Contents

Climate Urgency **3**

Climate-related Financial Risks **4**

Role of Finance in Solving Climate Change **5**

Financed Emissions Disclosure **8**

Enabling Community-Focused Lenders to Lead **9**

A Bank Mandate for Climate-Mitigating Lending **10**

The Nation's Balance Sheet **11**

Fiduciary Duty **12**

Unlocking Consumer Finance **14**

Conclusion **15**

Climate Urgency

The year 2020 marked a turning point in planetary systems – it was the warmest year on record, with Death Valley in California reporting a maximum temperature of 130 degrees F in August.[1] The United States experienced 22 separate billion-dollar weather and climate-related disasters, exacerbating the economic toll of COVID-19 and costing $95 billion in damages in a single year.[2]

As climate change pushes towards higher average global temperatures, we will continue to see a variety of sectors hurt: from grounded planes in Arizona because it's simply too hot to take off, to a dwindling food supply because heavy rain and snow storms in the Midwest blanket agricultural land. In an Economic Brief from the Federal Reserve Bank of Richmond, researchers explained that rising temperatures could reduce overall growth of U.S. economic output by as much as one-third by 2100.[3] The impacts of climate change are deep and widespread, with no one industry exempt.

In 2018, the Intergovernmental Panel on Climate Change (IPCC) outlined the impacts of climate change at 2.7°F (or 1.5°C). The report, which involved 91 authors and drew upon 6,000 research papers, emphasized the time-sensitive nature for mitigating climate change – we must accelerate action over the next decade to avoid significant loss of human, economic and ecosystem life.[4] In order to avert unprecedented upheaval, the global average temperature increase from pre-industrial levels must stay at or below 1.5°C. To remain within this limit, the global economy must cut annual global greenhouse gas emissions 45 percent below 2010 levels by 2030 and reach net zero (also known as becoming carbon neutral) by 2050. At the global level, this means that, in aggregate, all sources of anthropogenic GHG emissions that currently total up to 55 GT of CO_2 equivalent (CO2e) per year must reach zero. For the United States, which represents about 15% of the world's GDP and GHG emissions, this equates to roughly 6 GT of CO2e annually.[5]

If warming is allowed to increase to 4°C in the business-as-usual scenario, global economic losses from climate change are conservatively estimated to be $23 trillion per year—three to four times the scale of the 2008 financial crisis and more than three times the predicted contraction of global GDP due to COVID-19.[6] That estimate is conservative partly because it does not account for the effects of wildfires and other extreme events.

But we have choices. Another modelled estimate finds the economic cost of failing to cut emissions adds up to a burden of between $150 and $792 trillion by 2100, whereas the net benefit of climate change mitigation, on top of avoiding those losses, could be between $127 and $616 trillion by 2100.[7]

In short, it's cheaper to solve the climate crisis than to allow it to persist.

According to a comprehensive study by Princeton University, the U.S. must invest an additional $250 billion each year, compared to business-as-usual, for the next ten years at a minimum to

reach net zero by 2050. These investments would target energy supply, industry, buildings, and vehicles and could create 1 million new jobs.[8]

Climate-related Financial Risks

The impacts of climate change to the financial system manifest in multiple ways and can be grouped in both physical and transition risks.

Physical risk includes damage to properties and assets from the changing climate and related extreme weather events. Physical risks, whether acute or chronic, can lead to increased capital costs (e.g., damage to facilities), reduced revenues from lower sales/output, write-offs and early retirement of existing assets (e.g., damage to assets in "high-risk" locations), and increased operating costs (e.g., inadequate water supply for hydroelectric plants or to cool nuclear and fossil fuel plants). Physical risks include both demand and supply-side shocks to the financial system. For instance, rising sea levels may decrease demand for coastal real estate; saline intrusion of wells may impact drinking water supplies.

Transition risks are losses arising from the transition from a fossil fuel-based economy to a clean energy economy. The risks include credit risk (loan defaults from stranded assets, technology substitution of existing products and services with lower emissions options) and market risk (such as impairment of capital market assets), and can result in reduced demand for products and services and repricing of assets. Transition risks also capture the indirect effects of climate change, such as higher prices of raw materials, which may lead to less competition among firms, which in turn may lead to greater unemployment, which could result in greater insecurity. Taken together, once risks have manifested at the institutional and retail level, they reach the financial markets, through the classic market, credit, liquidity and operational risks.[9]

Worth special attention is the creation of stranded assets. This term describes an asset, such as a piece of equipment or a resource, which falls in value or can no longer produce revenue as a result of technological developments, market shifts or changing societal habits.[10] For example, by the early 20th century, the market for whale oil and oil lamps all but disappeared with the advent of electric lighting. The whaling industry's ships and the existing stock of oil lamps therefore became stranded assets. Today the term is often used to describe oil and gas resources that remain in the ground but appear as assets on a firm's balance sheet. Yet stranded assets are not only a problem for companies involved in fossil fuel extraction; businesses that use fossil fuels as production inputs, or are otherwise energy or carbon intensive could also be heavily impacted by climate legislation, technological breakthroughs, and a shift in demand as the global economy transitions away from fossil fuels.

In some sectors, such as coal, the stranding of assets has already begun due to the relative cost competitiveness of renewables. For example, globally, power generation from wind and solar installations are now less expensive to operate than coal—with almost 30 percent of new coal plants estimated to enter the market cash flow negative from their first day of operation[11]. Furthermore, investors and governments alike could find themselves with $630 billion worth of

stranded assets if the current global pipeline of new coal plant construction was to proceed.[12] If investing continues along a business-as-usual path, and the financial system fails to incorporate climate risks into its decision-making framework—businesses will inevitably end up with stranded assets across numerous sectors.

As the financial system and the real economy will both be devastated if the planet warms much more, and with real losses already manifesting in some sectors and asset classes, the challenge goes far beyond just protecting the financial system from climate risk. Investors and policymakers must choose if and why they should finance and back assets that are fundamentally unworkable, inconsistent with international agreements such as the Paris Agreement, and are likely to be stranded. In the case of coal, it would be wise for policymakers to plan now for the retirement of coal assets over the coming 10 years to minimize the financial risk of a disorderly energy transition.[13] The financial system, through new market rules, must integrate a shift from the single materiality of risk management to the double materiality of risk and impact management; this double materiality includes financial materiality and environmental and social materiality.[14]

Role of Finance in Solving Climate Change

Finance is absolutely essential. There will not be a transition to a low carbon economy without a way to finance the vast number of infrastructure, retrofit, new technology research, and various other projects needed. We saw annual climate investment flows rise to $579 billion, on average, over the two-year period of 2017-2018, with increases concentrated in low-carbon transport, North America, and East Asia. Nevertheless, this figure is not enough to maintain a well-below 2°C of warming target. Estimates of the global investment required to achieve that goal range from $1.6 to 3.8 trillion annually, for supply-side energy system investments alone.[15] However policymakers as well as businesses know that investments are not only associated with costs, they also bring returns and benefits. Therefore, while climate change is a significant crisis, it is also a significant opportunity to create jobs, wealth, and long-term economic prosperity—especially in the context of the ongoing U.S. economy's recovery from COVID-19.

In 2018 alone, the U.S. advanced energy industry generated $238 billion in revenue, which is roughly equal to that of aerospace manufacturing and double that of the biotech industry. The market for climate-smart technology is expected to grow significantly over the coming decade, estimated to be worth $23 trillion by 2030. Clean energy installations are also a steady source of state and local taxes—for example, wind farms paid $761 million to state and local governments in 2018 in addition to $289 million to farmers and landowners who leased their land to wind turbine operators. Investing $4 billion annually into reforestation and sustainable forest management could support an estimated 150,000 jobs per year, which is three times as many jobs as the logging industry provides.[16]

At the Hewlett Foundation, we've taken a lead on committing significant resources to climate initiatives – and for the first time in 2018-2023, we dedicated $75 million to Climate Finance and Investment grantmaking. This falls within our broader commitment of $600 million for

climate-focused grantmaking across four key geographies (the United States, China, India and Europe) within five sectors including Electricity, Transportation and Cities, Industry, Finance/Investment, and Technology, Innovation and R&D.

In developing our Climate Finance Strategy, we studied the financial system to better understand where capital was allocated, who owned or controlled it, and what the barriers were to financing more zero emissions energy, transportation, industry, and land use projects. What we found was nearly $250 trillion worth of commercial capital available globally in five primary capital pools including: Asset Owners, Retail Bank Deposits, Development Finance Institutions (DFI)/Multilateral Development Banks (MDB), Private Equity and Venture Capital. Broadly speaking, each of these pools of capital seek different risk/return profiles, comply with different regulations in different markets, and perform distinct functions in the global capital markets.[17]

The data clearly show that the problem is not lack of capital. Moreover, recent responses to COVID-19 have mobilized trillions from national budgets and the capital markets have re-bounded since March 2020, shifting trillions of dollars from retail and institutional investors to listed companies. Yet an estimated one-third of fixed income and public equity assets are still linked to climate change causing industries.[18] Therefore, the real challenge is moving those trillions to low-carbon investments. Numerous factors hold back this investment—entrenched beliefs, thinking, and processes associated with traditional methods of investment decision-making hamper action. For some investment professionals, false perceptions about investing in climate-friendly projects or technologies are common. For others, a lack of data or tools makes it too challenging to apply the consideration of the impacts and risks associated with climate change to their portfolio.

Through interviews, research and analysis, we identified eight key barriers that inhibit the expansion of opportunities to access and mobilize finance for climate-friendly activities. These include:

1. Limited Sources of High-Risk Capital
2. Pricing of Perceived Risks
3. Deal Size Preferences
4. Lack of Transparent Data
5. Policy Uncertainty
6. Timing of Climate Risk Impacts
7. Lack of climate-friendly investment guidelines
8. Short-term investment horizons

Limited Sources of High-Risk Capital: Early-stage investments provide the bridge between the research and development of a technology and scaling up. Typically, Venture Capital (VC) funds fill this gap and are an integral resource for early-stage investments and helping companies scale. Yet VC cleantech investments are heavily skewed towards late-stage projects concentrated around energy efficiency, transportation and smart grid. As such, 87% of VC cleantech investments went to late stage projects in 2016.

Pricing of Perceived Risks: Risks that apply to climate-friendly investments are often perceived by investors in vastly different ways. This results in a wide variation in pricing and capital availability. For example, energy efficiency projects are universally identified as critical to solving climate change; yet the inability to finance these projects based on the strength of their energy savings has limited their deployment. Investors' opinions, not always data, sometimes lead to an over reliance on the financial strength of the project hosts, which can lead to requiring credit enhancements or complicated structures to satisfy investors' concerns over the durability of energy savings.

Deal Size Preferences: The market for larger, centralized projects with vetted technologies initiated and supported by utilities, governments, corporations and other long-term credit worthy counterparties is well known and quite active. Yet, smaller, distributed projects—including solar photovoltaic, energy efficiency, electric vehicles, and others at the residential, small commercial and industrial sectors often have challenges accessing sufficient levels of long-term capital. This typically occurs because large institutional investors, such as pension funds, traditionally participate in utility scale deals on a significantly grander scale—where deals are worth $50 million or more. This preference for large deals means that relatively smaller projects worth $10,000, $100,000, or even $1,000,000 often get left out.

Lack of Transparent Data: A lack of consistent, transparent, and available data that reports the technical performance, energy production, and environmental impact of climate projects and other important factors limits the ability of potential investors to evaluate past performance of similar projects. This often results in higher risk premiums, which increase interest rates and return requirements and simultaneously decreases the number of interested investors. An inability to thoroughly assess projects increases hesitation among investors as they are further unable to evaluate and reduce perceived risk premiums for climate-friendly projects.

Policy Uncertainty: Further dissuading long-term investment in climate-friendly activities is the uncertainty associated with policies around climate change. Governments' shifting and sometimes unclear commitments to climate-related policy or regulations help to fuel investors' unease with entering the sector.

Timing of Climate Risk Impacts: Many professionals making investment decisions do not view climate change as a significant short-term risk that requires the adjustment of investment and credit considerations. The indefinite timing and magnitude of climate change impacts are often cited as key impediments to investors' ability to consider the financial risks of climate change in near term decision making and portfolio allocation methods.

Lack of Climate-Friendly Investment Guidelines: There is no unified definition for climate/ green/sustainable investments; or for climate finance activities that provide direct funding towards reaching climate goals and reducing GHG emissions. Practically speaking, this means that investors cannot easily compare different investment opportunities labeled 'green' or climate friendly. For example, securities can only be listed on the Bloomberg Barclays MSCI

Green Bond Index if they fall within at least one of six MSCI-defined eligible environmental categories: Alternative Energy, Energy Efficiency, Pollution Prevention and Control, Sustainable Water, Green Building, and Climate Adaptation.[19]

Short-Term Investor Horizons: Many investment decisions are focused on near-term risks and returns. For example, the hold period for investments is typically five to seven years, and therefore investors minimize risks further off into the future. There is also the expectation by many investors for maximum returns over each period they hold an investment. This pressure can lead investment managers to "chase" quarterly returns and not properly or fully analyze risk.

We structured our approach in the Climate Finance Strategy to foster and select projects that address one or more of these barriers. What we have learned from this work is that there are limits to what any one lender, asset owner or asset manager can do within its four walls and financial supply chain to enact the changes necessary to protect the financial system from climate-related downfall and support the low carbon economic transition. Fortunately, there are a number of actions that financial regulators and policymakers can take to safeguard the planet and people and provide adequate market rules to curb climate change.

Financed Emissions Disclosure

Step one is to mandate more information, but not just any information. Financial institutions must be required to measure and disclose the carbon emissions of their financial portfolios.[20] This list includes, but is not limited to sovereign bonds, listed equity, project finance, mortgages, commercial real estate, corporate debt: bonds, business loans, indirect investments, and auto-loans.

An open access, open source, widely used methodology for measuring and disclosing financed emissions comes from the Partnership for Carbon Accounting Financials (PCAF). PCAF is an international, industry-led initiative that enables financial institutions (FIs) to measure and disclose GHG emissions financed by loans and investments. A group of banks and investors launched PCAF during Climate Week in New York in September of 2019. Currently, over 100 FIs have joined and committed to assess and disclose their portfolio's GHG emissions, representing more than $25 trillion of assets under management (AUM).[21] The members of PCAF have harmonized an approach to assess and disclose the greenhouse gas (GHG) emissions of their loans and investments, accompanied by an emissions factor database.

There is global precedent for mandating financed emissions disclosure. For example, in March 2021, The European Banking Authority (EBA) issued a draft standard on the prudential disclosures on ESG risks, stating that European financial institutions should disclose the carbon footprint and scope 3 emissions[22] of their collaterals by June 2024.[23] The European Central Bank (ECB) published, in Section 7.2 of its final guide on climate-related and environmental risks for banks, that financial institutions are "expected to disclose the institution's financed scope 3

GHG emissions" and references the use of PCAF by a number of financial institutions in line with the GHG Protocol.[24]

Corporate disclosure of climate-related risks and opportunities will help investors fulfill their fiduciary obligations to integrate material climate considerations into their investment actions. Investors need consistent, comparable data, in a machine-readable format, so that they can efficiently and effectively aggregate and analyze climate-related financial disclosures. The Securities and Exchange Commission must update existing disclosure requirements to require that reporting companies disclose this data.

Enabling Community-Focused Lenders to Lead

Communities of color in the country bear the brunt of environmental degradation and pollution, and similar to the impacts of COVID-19, are likely to be disproportionately impacted by unabated climate change. The National Academy of Sciences found that the largest environmental health risk factor in the U.S., fine particulate matter (PM2.5), is disproportionately caused by consumption of goods and services mainly by the non-Hispanic white majority, but disproportionately inhaled by Black and Hispanic minorities.[25] Due to the increased air pollution burden, higher likelihood of living in climate risk zones (such as flood zones, isolated rural areas, and urban heat islands), higher likelihood of living in areas with aging and poorly maintained infrastructure, low-income groups, communities of color, and some immigrant populations are highly vulnerable to the health impacts of climate change.[26]

In addition to living in communities disproportionately affected by pollution and vulnerable to climate change, both rural and urban low-income households spend three times as much of their income on energy than non-low-income households, a phenomenon known as energy burden.[27] In 2015, an estimated 17 million households received an energy disconnect/delivery stop notice and 25 million households had to forgo food and medicine to pay energy bills.[28] To help low or moderate income (LMI) households mitigate the effects of climate change and access renewable energy technologies, community-focused lenders and other community-based financing schemes can be leveraged.

There are over 100 minority depository institutions (MDIs), over 1,000 community development financial institutions (CDFIs), over 5,000 credit unions, and over 5,000 deposit-taking banks that are poised to serve climate-impacted communities in the United States. However, the federal government has a critical role to play in ensuring the successful alignment of these institutions with solving climate change. There are a number of existing federal programs that need to be updated in the short-run to align financial incentives with the clean energy transition. For example, the creation of a dedicated clean energy grant program as a part of the CDFI fund would be beneficial. There is precedence for this approach, with CDFI Funds already having dedicated grant program award 'buckets' to efforts outside of traditional awards, such as the Healthy Foods Financing Initiative and Disability Funds Financial Assistance.[29] This approach would ensure that more CDFIs focus on financing clean energy, which in turn boosts innovation

and impact. As such, dedicated clean energy awards could be structured to assist CDFIs to fund solar and energy efficiency loans.[30]

Credit unions are another powerful source of financing that can be deployed to help communities access funds for everything from home solar to energy efficiency retrofits and electric vehicles. However, what they lack is the technical assistance and the patient capital to be able add the 'clean energy asset class' to their loan books. A key challenge is access to secondary capital for loss absorption. Unlike banks, which have different instruments available to them, secondary capital for credit unions has historically been provided by philanthropic organizations or as loans – with demand significantly outstripping supply.[31]

The National Credit Union Administration (NCUA) should expand access to secondary capital, including equity, for credit unions engaging in climate mitigation and green opportunity financing, and allow credit unions to service small businesses for climate mitigation related lending, similar to the current rule for low-income lending. At the same time, we see the need for an injection of long-term, low-cost capital to enable rapid scaling of credit union's lending capacities in the communities most impacted by COVID-19 and climate change. Therefore, Treasury should provide direct investment of secondary capital into credit unions to support the lending needed for economic recovery and long-term climate change mitigation.[32] Note that this approach is not without precedent either. In 2010, Treasury made an investment of $70 million to secondary capital for CDFI-certified credit unions—where every dollar invested resulted in $60 worth of loans over the intervening years.[33]

Some credit unions such as the Clean Energy (Federal) Credit Union and Inclusiv (a network of community development credit unions) are already focusing on clean energy and seeing success. For example, in its first three years of operations the Clean Energy Credit Union has reported zero delinquencies and has sold loan participations across the U.S. including Texas, Oklahoma, and Montana. As a low-income designated cooperative bank, they are already teaching other credit unions the value of this asset class. Similarly, Inclusiv offers green lending training for all community-focused lenders along two tracks: commercial/project finance and residential/consumer loans. Importantly, these existing lenders are financially stable—meaning they pass the regulatory tests set by the FDIC and NCUA on an annual basis.

A Bank Mandate for Climate-Mitigating Lending

An important way to unlock trillions of dollars with zero public spending is through mandates, a series of incentives and penalties for lenders to meet climate change mitigation lending amounts. The Community Reinvestment Act (CRA) provides a precedent for such action. The existing CRA can be strengthened to explicitly provide credit for climate and clean energy loans. A new mandate that requires banks to invest a certain percentage of their assets into climate friendly infrastructure can also be instated.

The CRA seeks to ensure that banks meet the credit needs of their entire service territory, including low- and moderate-income neighborhoods. The OCC, FDIC and Federal Reserve Board

enforce the CRA by evaluating depository institutions according to size-differentiated rubrics; large banks are scored on the basis of lending, investment and service and receive one of four grades: outstanding, satisfactory, needs to improve, and substantial noncompliance.[34]

While the CRA has been largely beneficial to LMI communities, up until now it has not focused on addressing environmental justice. Incorporating sustainability metrics for LMI communities into the CRA would drive new investments and loans to help mitigate disproportionate negative impacts and increase LMI community access to the benefits of clean energy. The CRA should explicitly include climate-friendly investments as allowable activities; this would provide banks and financial regulators with better data on how many investments are being made and in what areas, which in turn will also likely increase these types of investments.[35] The following specific changes to the existing CRA would enable more climate capital in underserved communities that can serve both wealth-building and climate resiliency purposes: 1) extend CRA coverage to non-banks, including credit unions, which would expand access to credit in banking deserts[36], 2) measure financial institution performance by outcomes, including carbon emission levels and other criteria for climate justice, 3) create a stronger focus on geographic racial and ethnic disparities due to the disproportionate impact of climate change on zip codes with high concentrations of people of color, and 4) mandate that affordable housing (including mixed income units) be sustainable and energy-efficient for CRA credit.

In addition to CRA modifications, the following interventions would also create climate resiliency and wealth creating opportunities for LMI communities: fostering a municipal green bond market that meets the Principles of Environmental Justice[37] and climate-focused New Markets Tax Credits[38].

The CRA is estimated to mobilize about $300 billion annually to LMI communities. Climate is another area of underinvestment and thus warrants a CRA-style mandate. Congress can instruct financial institutions (FIs), especially SIFIs, to lend and invest in GHG-reducing activities across financial asset classes. The FIs would be rated and these ratings would be taken into account for regulatory approvals, including mergers and acquisitions. In addition, FIs that fail to meet minimum thresholds for decarbonization could incur fees.

The Nation's Balance Sheet

During the 2020 economic disruption provoked by the COVID-19 pandemic, the Federal Reserve made 83% of the oil and gas industry's mostly below investment grade debt eligible for cheap refinancing.[39] Coal, oil and gas companies received nearly $3.9 billion in government aid.[40] The financial regulators, including the Fed, thus ignored sound risk management by failing to incorporate climate-related financial risks. The Fed is prohibited from making investments into companies that are insolvent or likely to become so[41], yet by extending corporate bond purchases to 'junk bonds,' the nation's balance sheet has been put in peril. Fossil fuel energy companies make up 13 percent of the lowest-rated, riskiest kind of corporate debt.[42] This climate change-causing sector also disproportionately relies on heavily leveraged loans, collateralized loan obligations, and other low-rated debt.[43]

Climate risk should be incorporated into Dodd Frank Act stress tests in order to have a more accurate picture of financial stability. However, the Federal Reserve and other financial regulators should not wait on the results of such tests to enact climate finance regulations. To lead to material shifts away from the dirty economy towards a clean one, a 'precautionary' financial policy approach is required. This approach takes into account that climate related financial risks are different from others — they are endogenous and systemic, irreversible, pervasive, and have a high level of uncertainty in terms of very specific points of impact.[44]

The business of risk analysis is generally based on forward-looking projections that build on past data and as such, the future is conceived as a replication of the past. Climate impacts, which are multidimensional, non-linear, and attached to underlying socio-economic realities, do not work that way—they exist in the realm of uncertainty, whereby the future is "unknowable and unpredictable."[45]

Taking a precautionary approach to climate financial policy, policymakers at all levels of government can enact regulations to limit the financing of climate change causing activities and incentivize climate change solving ones. Therefore, the country's bank, the Federal Reserve, and other financial regulators should ensure that the financial system is working for climate mitigation. Tools include a differential interest rate for carbon intensive lending, different capital requirements for carbon intensive lending, and a corporate equity and bond purchasing policy that is negatively screened for carbon. Not only should policymakers such as the SEC and OCC instruct banks and asset managers to measure and disclose their financed emissions, but The Federal Reserve itself should also measure and disclose the greenhouse gas emissions that it is financing through its operations, starting with its emergency lending portfolio in response to the coronavirus crisis.[46] Asset managers and insurance companies, through a designation as non-bank SIFIs by the FSOC, can also come under supervision and regulation by the Federal Reserve.[47] The Federal Reserve can also take the following measures: 1) require banks that own coal, oil and gas assets to retire them, 2) limit banks' ability to own and run nonfinancial businesses, and 3) implement higher risk-weighted bank capital requirements for assets that are sensitive to the price of carbon such as fossil fuels, deforestation, and internal combustion engine vehicles.[48] On the latter, the minimum ratios of capital to assets, known as risk-based capital, should reflect the potential for losses due to physical and transition climate risks. Risk weights could be increased for loans and investments in climate change-driving assets, such as the financing of the industries that account for most global industrial greenhouse gas emissions in coal, oil, gas, and agribusiness tied to deforestation.[49]

Fiduciary Duty

The market has spoken when it comes to the financial benefit of incorporating environmental, social and governance (ESG), including climate impact factors, into investment decisions. The majority of ESG funds outperform non-ESG counterparts and ESG ETFs doubled in 2020.[50] ESG, including climate mitigation strategies, are preferred by investors for a number of reasons, including that this information allows for better decision making, better management and

mitigation of risks, and ultimately the generation of risk-adjusted returns. Sustainable investing assets now account for $17.1 trillion—or 1 in 3 dollars—of the total US assets under professional management. This represents a 42 percent increase over 2018.[51]

Investment in climate change causing industries, such as fossil fuels, poses a long-term risk to generating strong returns for a diversified portfolio. In the last ten years, the S&P energy sector gained just 1% as low oil prices, high operational costs and changing consumer preferences spurred selling. However, in the same time period, the broader market gained 212%. Investors and lenders now require higher hurdle rates for climate change-causing industries since they produce a lower return on investment capital. If we look at hurdle rates, coal projects need 40%+ whereas developed market solar & wind need just 10+%.[52] Policymakers should therefore protect worker's savings and maximize returns by instructing ERISA fiduciaries to incorporate ESG risks and opportunities, explicitly climate considerations, into investment options.

Climate change is always material. Fiduciaries, as those responsible for acting in their client's best financial interest, would be unfit should they not consider such an important and pervasive risk as climate change. Climate pollution is not like other sources of air, water and land point-source contaminants - GHG emissions are omnipresent and impacts are widespread, including in transportation, energy, real estate, food production, water and wastewater infrastructure. By neglecting climate factors, investors will likely misprice risk and poorly allocate assets; this is in part why globally there are over 730 policies across 500 policy instruments that support or require the incorporation of ESG issues in the fiduciary process.[53]

Policymakers at all levels of government, including state pension fund regulators, the SEC, FINRA, and the Department of Labor (DOL), should modernize fiduciary duty definitions to align with ESG, including climate risk and impact. Climate specific fiduciary regulations should include retirement fiduciaries (including pension plans), investment advisers registered with the SEC, broker-dealers and other financial intermediaries (subject to federal securities laws), asset managers that are not registered with the SEC, and non-profit asset owners. Trustee boards and investment committees should demonstrate the consideration of climate and ESG impacts in the investment process and through the investment policy. DOL should (1) issue guidance that explicitly calls out climate factors as "pecuniary" and therefore important considerations for ERISA fiduciaries and (2) issue a rule to clarify that climate factors are material and require ERISA plan fiduciaries adopt and implement sustainable investment policies. FINRA should enact reforms to the KYC rules to include seeking information about customer ESG-related preferences. The SEC should at a minimum (1) implement a rule under Section 203(c)1(C) under the Investment Advisers Act of 1940 requiring the Form ADV to require investment advisers to adopt and implement sustainable investment policies that incorporate climate risk and impact and (2) implement a rule under the Investment Company Act to require a fund to disclose on its prospectus and statement of additional information how the fund identifies, assesses, and addresses key climate issues, votes and otherwise engages with companies of portfolio securities consistent with sustainable investment policies, and has been audited for compliance with the policies.

Unlocking Consumer Finance

Demand deposits are a bedrock of the financial system. Banks leverage consumer deposits to make loans and purchase assets; these accounts also create a customer relationship that results in fees for bank services and other product sales such as credit cards and auto loans. Domestic demand deposits in FDIC-insured banks and savings institutions are roughly at $15 trillion.[54] If only 1.7% of these deposits were mobilized annually for climate solutions, the nation would surpass the additional investment amount needed to reach net zero by 2050 and avert a climate-induced financial crisis. Only 1.7% of capital sitting in our everyday bank accounts.

Unfortunately, it is currently cumbersome for consumers to align their deposits with a people and planet-friendly economy. Opening a new account and closing an old account is "rarely easy and is usually hard."[55]

Switching bank accounts should be as easy as switching broker dealers and telephone providers. U.S. consumers now own their phone numbers, allowing them to easily choose a provider that suits their needs. This was enabled by the 1996 Telecommunications Act that required all carriers to offer mobile number portability (MNP). MNP allows consumers to contact a new carrier, who then transfers the account and service by contacting the consumer's current carrier. After receiving consumer complaints about transferring brokerage accounts, FINRA helped establish the Automated Customer Account Transfer Service; implemented in 2006, this allows consumers to transfer accounts and common assets such as cash or stocks from one broker-dealer to another, usually within a week.[56]

Allowing retail and institutional consumers to own their bank account number and developing a system that allows for seamless switching would also enable consumers to have full rights and choice. There is international precedent and best practice for government enabling consumer switching. The United Kingdom implemented the Current Account Switch Service (CASS) in 2013 to provide seamless and quick switches in current accounts.[57] The current barriers to switching accounts include the following processes: 1) needing to gather several pieces of information that one may not immediately have, such as the login details for current accounts and a driver's license number 2) the tediousness of needing to input information in poorly designed print or online forms, 3) the multiplicity of needing to switch direct deposit, linked cards, linked apps, and auto-pay, and 4) the lack of incentive or deadline to finish the process.[58]

With 93% of households in the U.S. having a bank account and 7 in 10 supporting government action to solve climate change[59], democratizing the ability to switch to climate-friendly bank accounts is a policy imperative. There is a growing movement of depository institutions, such as those listed in the Bank for Good campaign[60], that are limiting their exposure to climate risk and supporting the real economy in clean energy lending. Numerous examples of consumer behavior leading to significant market shifts include hundreds of millions moved to Black owned banks and Bank of America and other banks announcing that they would no longer charge a monthly fee for debit card holders after intense consumer pushback.[61]

In order to enhance consumer choice in banking, policymakers can enact a number of changes, including: 1) reducing transactions costs through account portability rules, 2) mandating transparency for consumers around a bank's ESG practices, including the carbon footprint of loans and investments, and 3) lowering costs associated with closing and switching accounts. For the third change, the CFPB could set standards for lenders and third-party platforms that facilitate switching accounts, including eliminating the need to hold funds in two accounts at the same time.[62]

Conclusion

All sectors of the economy will be impacted by climate change if the financial system does not work for the low carbon transition. These impacts will be especially acute in energy, transportation, and agriculture across the United States.[63] Climate change, if left unabated, is expected to transform the regions of the U.S. in some of the following ways:

- West and Northwest: changed precipitation patterns (including drought) and snow pack, increased risk of wildfires.
- Great Plains and the Midwest: increased frequency and severity of flooding and drought.
- Northeast and Mid-Atlantic: increased storms and sea level rise.
- South and Southwest: decreased precipitation levels, leading to less water resources for agriculture, industry and households.
- Southeast: warmer temperatures with more extreme heat waves, increased sea level rise, increased hurricane intensity and associated impacts to coastlines.
- Hawaii: increased sea level rise, loss of coral reefs, and increased drought.
- Puerto Rico: increased sea level rise, loss of coral reefs, increased frequency and intensity of hurricanes.
- Alaska: declined sea ice, earlier breakup of river ice in the Spring, and thawing of permafrost.

In order to avert economic disaster, the financial system must incorporate climate risk and impact into the market rules. The following changes will enable the system to finance less of the GHG emitting activities and more of the GHG reducing activities, all while supporting millions of new well-paid jobs that do not harm communities and help build wealth: mandating annual carbon accounting for financial institutions and reduction targets to reach net zero, providing patient capital to community-focused lenders to scale climate-friendly loans, adjusting capital requirements and risk weights for banks based on carbon emissions, implementing a climate-friendly grading system for SIFIs modeled after the CRA, and mandating the incorporation of ESG, including climate impact, into investment management.

[1] Laura Newberry. LA Times, Aug 16, 2020. Death Valley hits 130 degrees, thought to be highest temperature on Earth in nearly a century. https://www.latimes.com/california/story/2020-08-16/death-valley-hits-130-degrees-thought-to-be-earths-highest-temperature-in-more-a-century

[2] NOAA National Centers for Environmental Information (NCEI) U.S. Billion-Dollar Weather and Climate Disasters (2021). https://www.ncdc.noaa.gov/billions/, DOI: 10.25921/stkw-7w73

[3] Riccardo Colacito, Bridget Hoffmann, Toan Phan and Tim Sablik. Federal Reserve Bank of Richmond Economic Brief, August 2018, No. 18-08. The Impact of Higher Temperatures on Economic Growth https://www.richmondfed.org/publications/research/economic_brief/2018/eb_18-08

[4] Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change. https://www.ipcc.ch/sr15/

[5] Climate Watch. 2020. Washington, DC: World Resources Institute. Available online at: https://www.climatewatchdata.org.

[6] Tom Kompas. Phys.org. U.S. $23 trillion will be lost if temperatures rise four degrees by 2100. August 15, 2018. https://phys.org/news/2018-08-trillion-lost-temperatures-degrees.html

[7] Wei, YM., Han, R., Wang, C. et al. Self-preservation strategy for approaching global warming targets in the post-Paris Agreement era. Nat Commun 11, 1624 (2020). https://doi.org/10.1038/s41467-020-15453-z

[8] E. Larson, C. Greig, J. Jenkins, E. Mayfield, A. Pascale, C. Zhang, J. Drossman, R. Williams, S. Pacala, R. Socolow, EJ Baik, R. Birdsey, R. Duke, R. Jones, B. Haley, E. Leslie, K. Paustian, and A. Swan, Net-Zero America: Potential Pathways, Infrastructure, and Impacts, interim report, Princeton University, Princeton, NJ, December 15, 2020.

[9] Hugues Chenet, Josh Ryan-Collins, Frank van Lerven, Finance, climate-change and radical uncertainty: Towards a precautionary approach to financial policy, Ecological Economics, Volume 183, 2021, 106957, ISSN 0921-8009, https://doi.org/10.1016/j.ecolecon.2021.106957

[10] Joel Makower. GreenBiz. The growing concern over stranded assets. September 10, 2019. https://www.greenbiz.com/article/growing-concern-over-stranded-assets

[11] Carbon Tracker. Stranded Assets. August 2017. https://carbontracker.org/terms/stranded-assets/

[12] Catharina Hillenbrand Von Der Neyen. Carbon Tracker, COP26: A chance to reset and eliminate obstacles – coal in sights. January 21, 2021. https://carbontracker.org/cop26-a-chance-to-reset-and-eliminate-obstacles-coal-in-sights/

[13] Catharina Hillenbrand Von Der Neyen. Carbon Tracker, COP26: A chance to reset and eliminate obstacles – coal in sights. January 21, 2021. https://carbontracker.org/cop26-a-chance-to-reset-and-eliminate-obstacles-coal-in-sights/

[1414] James Vaccaro. Climate Safe Lending Network. Taking the Carbon Out of Credit. July 2020. https://www.climatesafelending.org/taking-the-carbon-out-of-credit

[15] de Coninck, H., A. Revi, M. Babiker, P. Bertoldi, M. Buckeridge, A. Cartwright, W. Dong, J. Ford, S. Fuss, J.-C. Hourcade, D. Ley, R. Mechler, P. Newman, A. Revokatova, S. Schultz, L. Steg, and T. Sugiyama, 2018: Strengthening and Implementing the Global Response. In: *Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty* [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. In Press. https://www.ipcc.ch/sr15/chapter/chapter-4/

[16] Joel Jaeger and Devashree Saha. World Resources Institute. July 28, 2020. 10 Charts Show the Economic Benefits of US Climate Action. https://www.wri.org/blog/2020/07/economic-benefits-climate-action-us

[17] The William and Flora Hewlett Foundation. (2019). Climate Finance Strategy 2018-2023. https://hewlett.org/wp-content/uploads/2019/09/Hewlett-Climate-Finance-Strategy-2018-2023.pdf.

[18] Adam Tooze. Foreign Policy.*Why Central Banks Need to Step Up on Global Warming*
A decade after the world bailed out finance, it's time for finance to bail out the world. July 20, 2019. https://foreignpolicy.com/2019/07/20/why-central-banks-need-to-step-up-on-global-warming/

[19] Bloomberg Barclays MSCI Global Green Bond Index.
https://www.msci.com/documents/10199/242721/Barclays_MSCI_Green_Bond_Index.pdf

[20] Marilyn Waite. Financial Times. *Carbon accounting should be a basic requirement for banks*. August 30, 2020. https://www.ft.com/content/fcaa31d2-84a2-4c9e-8532-cbd7e23d22d0

[21] Partnership for Carbon Accounting Financials (PCAF). https://carbonaccountingfinancials.com/

[22] According to the GHG Protocol, Scope 1 encompasses all direct GHG emissions, Scope 2 encompasses indirect GHG emissions from consumption of purchased electricity, heat or steam, and Scope 3 encompasses other indirect emissions, such as the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity, electricity-related activities not covered in Scope 2, outsourced activities, and waste disposal. https://ghgprotocol.org/calculationg-tools-faq

[23] European Banking Authority (EBA). March 1, 2021. Draft Implementing Standards on prudential disclosures on ESG risks in accordance with Article 449a CRR.

[24] European Central Bank (ECB). ECB publishes final guide on climate-related and environmental risks for banks. November 27, 2020.
https://www.bankingsupervision.europa.eu/press/pr/date/2020/html/ssm.pr201127~5642b6e68d.en.html

[25] Inequity in consumption of goods and services adds to racial–ethnic disparities in air pollution exposure. Christopher W. Tessum, Joshua S. Apte, Andrew L. Goodkind, Nicholas Z. Muller, Kimberley A. Mullins, David A. Paolella, Stephen Polasky, Nathaniel P. Springer, Sumil K. Thakrar, Julian D. Marshall, Jason D. Hill
Proceedings of the National Academy of Sciences Mar 2019, 116 (13) 6001-6006; DOI: 10.1073/pnas.1818859116

[26] Gamble, J.L., J. Balbus, M. Berger, K. Bouye, V. Campbell, K. Chief, K. Conlon, A. Crimmins, B. Flanagan, C. Gonzalez-Maddux, E. Hallisey, S. Hutchins, L. Jantarasami, S. Khoury, M. Kiefer, J. Kolling, K. Lynn, A. Manangan, M. McDonald, R. Morello-Frosch, M.H. Redsteer, P. Sheffield, K. Thigpen Tart, J. Watson, K.P. Whyte, and A.F. Wolkin, 2016: Ch. 9: Populations of Concern. *The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment*. U.S. Global Change Research Program, Washington, DC, 247-286.
http://dx.doi.org/10.7930/J0Q81B0T

[27] Bednar, D.J., Reames, T.G. Recognition of and response to energy poverty in the United States. Nat Energy 5, 432–439 (2020). https://doi.org/10.1038/s41560-020-0582-0

[28] EIA. 2015 Residential Energy Consumption Survey (RECS).
https://www.eia.gov/consumption/residential/reports/2015/overview/

[29] Melissa Malkin-Weber, David Beck, Brian Schneiderman and Philip E. Otienoburu. Self-Help and the Center for Responsible Lending. The Climate Imperative and Community Finance. February 2021. https://self-helpfcu.org/docs/default-source/pdfs/climate-imperative--final-release-2102021.pdf?sfvrsn=2&_ga=2.9866101.1144720960.1615690490-925116982.1615690490

[30] Melissa Malkin-Weber, David Beck, Brian Schneiderman and Philip E. Otienoburu. Self-Help and the Center for Responsible Lending. The Climate Imperative and Community Finance. February 2021. https://self-helpfcu.org/docs/default-source/pdfs/climate-imperative--final-release-2102021.pdf?sfvrsn=2&_ga=2.9866101.1144720960.1615690490-925116982.1615690490

[31] Regenerative Crisis Responsive Committee (RCRC). Fact Sheet: Secondary Capital for Climate Finance. 2021. https://regenerativecrisisresponsecommittee.org/recentwork/factsheet-secondarycapital

[32] Regenerative Crisis Responsive Committee (RCRC). Fact Sheet: Secondary Capital for Climate Finance. 2021. https://regenerativecrisisresponsecommittee.org/recentwork/factsheet-secondarycapital

[33] Regenerative Crisis Responsive Committee (RCRC). Fact Sheet: Secondary Capital for Climate Finance. 2021. https://regenerativecrisisresponsecommittee.org/recentwork/factsheet-secondarycapital

[34] Michela Zonta and Zoe Willingham. Center for American Progress. A CRA To Meet the Challenge of Climate Change Advancing the Fight Against Environmental Racism. December 17, 2020. https://www.americanprogress.org/issues/economy/reports/2020/12/17/493886/cra-meet-challenge-climate-change/

[35] Irene Farnsworth and Rawan Elhalaby. The Greenlining Institute. *Investing in Climate Equity: Lessons and Opportunities for Increasing Green Bank Investments in Communities of Color*. January 2021. https://greenlining.org/wp-content/uploads/2021/01/Greenlining-Investing-in-Climate-Communities-Report-2021.pdf

[36] Michela Zonta and Zoe Willingham. Center for American Progress. A CRA To Meet the Challenge of Climate Change Advancing the Fight Against Environmental Racism. December 17, 2020. https://www.americanprogress.org/issues/economy/reports/2020/12/17/493886/cra-meet-challenge-climate-change/

[37] Principles of Environmental Justice. https://www.ejnet.org/ej/principles.html

[38] Melissa Malkin-Weber, David Beck, Brian Schneiderman and Philip E. Otienoburu. Self-Help and the Center for Responsible Lending. The Climate Imperative and Community Finance. February 2021. https://self-helpfcu.org/docs/default-source/pdfs/climate-imperative--final-release-2102021.pdf?sfvrsn=2&_ga=2.9866101.1144720960.1615690490-925116982.1615690490

[39] Sarah Bloom Raskin. NY Times. *Why Is the Fed Spending So Much Money on a Dying Industry*? May 2020. It should not be directing money to further entrench the carbon economy. https://www.nytimes.com/2020/05/28/opinion/fed-fossil-fuels.html

[40] Jayson O'Neill. Western Values Project. Over One-Third Of All Oil, Gas, and Mining Corporations Already Awarded Bailout Funds. April 28, 2020. https://westernvaluesproject.org/over-one-third-of-all-oil-gas-and-mining-corporations-already-awarded-bailout-funds/

[41] Graham Steele. The American Prospect. *A Climate Bailout Is a Big Finance Bailout.* And now is not the time for either. The Federal Reserve should take note. April 22, 2020. https://prospect.org/economy/climate-bailout-is-big-finance-bailout/

[42] Joe Rennison and Jennifer Ablan. Financial Times. *US energy 'junk' bonds hammered by oil plunge.* January 29, 2020. https://www.ft.com/content/55f74150-4225-11ea-a047-eae9bd51ceba

[43] Graham Steele. The American Prospect. *A Climate Bailout Is a Big Finance Bailout.* And now is not the time for either. The Federal Reserve should take note. April 22, 2020. https://prospect.org/economy/climate-bailout-is-big-finance-bailout/

[44] Hugues Chenet, Josh Ryan-Collins, Frank van Lerven, Finance, climate-change and radical uncertainty: Towards a precautionary approach to financial policy, Ecological Economics, Volume 183, 2021, 106957, ISSN 0921-8009, https://doi.org/10.1016/j.ecolecon.2021.106957

[45] Hugues Chenet, Josh Ryan-Collins, Frank van Lerven, Finance, climate-change and radical uncertainty: Towards a precautionary approach to financial policy, Ecological Economics, Volume 183, 2021, 106957, ISSN 0921-8009, https://doi.org/10.1016/j.ecolecon.2021.106957

[46] Andy Green, Gregg Gelzinis, and Alexandra Thornton. *Financial Markets and Regulators Are Still in the Dark on Climate Change*. June 2020. Center for American Progress. https://www.americanprogress.org/issues/economy/reports/2020/06/29/486893/financial-markets-regulators-still-dark-climate-change/

[47] Graham Steele. The American Prospect. *Overhaul the Business of Wall Street Remaking the financial system does not require any new laws.* September 23, 2019. https://prospect.org/day-one-agenda/overhaul-the-business-of-wall-street/

[48] Gregg Gelzinis and Graham Steele. Climate Change Threatens the Stability of the Financial System. November 21, 2019. https://www.americanprogress.org/issues/economy/reports/2019/11/21/477190/climate-change-threatens-stability-financial-system/

[49] Steele, Graham, Confronting the 'Climate Lehman Moment': The Case for Macroprudential Climate Regulation (February 22, 2020). 30 Cornell J.L.& Pub. Pol'y 109 (2020), Available at SSRN: https://ssrn.com/abstract=3542840

[50] Americans for Financial Reform Education Fund (AFR). Sustainable Investing Under the New ERISA ESG Rules. 2021. https://ourfinancialsecurity.org/wp-content/uploads/2021/01/Factsheet_ESG_ERISA-Rules_final.pdf

[51] US SIF Foundation. 2020. Report on US Sustainable and Impact Investing Trends 2020. https://www.ussif.org/files/US%20SIF%20Trends%20Report%202020%20Executive%20Summary.pdf

[52] R. West. *High Hurdles. What if fossil fuels are starved of capital*? Redburn Research. (2018). Redburn Research

[53] Rory Sullivan, Will Martindale, Elodie Feller, Margarita Pirovska, and Rebecca Elliott. UNEP FI and PRI, Fiduciary Duty in the 21st Century. https://www.unpri.org/download?ac=9792

[54] Divya Vijay and Andy Green. Center for American Progress. *Switching to Responsible Banking How Empowering Consumers to Switch Accounts Can Boost Bank Accountability to Consumers, Workers, and the Planet*. February 26, 2021. https://www.americanprogress.org/issues/economy/reports/2021/02/26/496444/switching-responsible-banking/

[55] Maya Faulstich-Hon, Rebecca Oran, Erin Sherman, Griffin Smith and Sarah Welch. Ideas42. January 2020. Bank on What You Believe: Behavioral Insights to Accelerate Adoption of Sustainable Bank Deposit Accounts. https://www.ideas42.org/wp-content/uploads/2019/10/I42-1196_Sustainable-Banking_Jan22.pdf

[56] Financial Industry Regulatory Authority (FINRA). *Understanding the Brokerage Account Transfer Process*. Available: https://www.finra.org/investors/learn-to-invest/brokerage-accounts/understanding-brokerage-account-transfer-process

[57] BBC. Bank account switching service to launch in September. August 2013. https://www.bbc.com/news/business-23700012

[58] Maya Faulstich-Hon, Rebecca Oran, Erin Sherman, Griffin Smith and Sarah Welch. Ideas42. January 2020. Bank on What You Believe: Behavioral Insights to Accelerate Adoption of Sustainable Bank Deposit Accounts. https://www.ideas42.org/wp-content/uploads/2019/10/I42-1196_Sustainable-Banking_Jan22.pdf

[59] Yale Program on Climate Change Communication. September 2019. Poll: American Voters Support Climate Action https://climatecommunication.yale.edu/news-events/poll-american-voters-support-climate-action/

[60] https://bankforgood.org/

[61] Tara Siegel Bernard. (November 2011). NY Times. In Retreat, Bank of America Cancels Debit Card Fee. https://www.nytimes.com/2011/11/02/business/bank-of-america-drops-plan-for-debit-card-fee.html

[62] Divya Vijay and Andy Green. Center for American Progress. *Switching to Responsible Banking How Empowering Consumers to Switch Accounts Can Boost Bank Accountability to Consumers, Workers, and the Planet.* February 26, 2021. https://www.americanprogress.org/issues/economy/reports/2021/02/26/496444/switching-responsible-banking/

[63] Matthias Ruth, Roy F. Weston, Dana Coelho, and Daria Karetnikov. Center for Integrative Environmental Research (CIER) at the University of Maryland. *The Economic Impacts of Climate Change and the Costs of Inaction*. http://cier.umd.edu/climateadaptation/