

MANDATING DISCLOSURE OF CLIMATE-RELATED FINANCIAL RISK

*Madison Condon, Sarah Ladin, Jack Lienke,
Michael Panfil & Alexander Song**

Climate change presents grave risk across the U.S. economy, including to corporations, their investors, the markets in which they operate, and the American public at large. Unlike other financial risks, however, climate risk is not routinely disclosed to the public. Insufficient corporate disclosures have persisted despite the Securities and Exchange Commission’s (“SEC”) issuance of regulatory guidance on the topic, the emergence of voluntary disclosure frameworks and standards, and growing calls from major investors for improved disclosure.

Given the inadequacy of the current regime, the SEC should take further action to fulfill its statutory mandate to protect investors and promote efficiency, competition, and capital formation. Specifically, the Commission should issue new, mandatory disclosure regulations that will yield comparable, specific, and decision-useful climate risk information.

This Article makes process-oriented recommendations relevant to the development of mandatory climate risk disclosure rules. The Commission should draw on existing frameworks and standards in crafting new regulations. The Commission should also draw on climate-related expertise at other federal agencies through interagency working groups. Finally, the SEC should increase its own expertise in this area by conducting economic research on climate risk through its Division of Economic and Risk Analysis. Taken together, these actions will facilitate informed investing, sustainable growth, and a more resilient economy.

INTRODUCTION	747
I. UNDERSTANDING AND IDENTIFYING CLIMATE RISK	749
A. Physical Risk	749
B. Transition Risk	755
i. Policy and Legal Risk	755

* Madison Condon is an Associate Professor of Law at Boston University School of Law and an Affiliate Scholar at the Institute for Policy Integrity at NYU School of Law. Sarah Ladin is an Attorney at the Institute for Policy Integrity. Jack Lienke is the Regulatory Policy Director at the Institute for Policy Integrity. Michael Panfil is a Senior Attorney and Director of Federal Energy Policy at EDF. Alexander Song is a Legal Fellow at the Institute for Policy Integrity. The authors thank Richard Berner, Sean Donahue, Robert Engle, Andy Green, Jayni Hein, Alice Hill, Gabe Malek, Heather McTeer-Toney, Vickie Patton, Ben Ratner, Richard Revesz, Steven Rothstein, Jeff Smith, and Alex Thornton for valuable feedback.

ii.	Technology Risk	757
iii.	Market and Reputational Risk	758
III.	EXISTING SEC REGULATORY REQUIREMENTS AND VOLUNTARY FRAMEWORKS	759
A.	SEC Regulation S-K, Form 10-K, and the 2010 Climate Disclosure Guidance	762
i.	The Materiality Standard	762
ii.	The 2010 Climate Disclosure Guidance	765
B.	Voluntary Frameworks and Standards: TCFD and SASB	768
i.	The TCFD Framework	769
ii.	The SASB Standards	772
C.	The Existing Regime Is Not Producing Sufficient Disclosure	775
IV.	CURRENT IMPEDIMENTS TO IMPROVED DISCLOSURE	777
A.	Markets' Failure to Drive Disclosure	778
B.	SEC Non-Enforcement	781
V.	THE BENEFITS OF IMPROVED DISCLOSURE FOR CORPORATIONS, INVESTORS, MARKETS, AND SOCIETY ..	783
A.	Benefits for Corporations	785
B.	Benefits for Investors	786
C.	Benefits for Markets	789
D.	Benefits for Society	790
VI.	HOW THE SEC CAN SECURE IMPROVED DISCLOSURES ..	792
A.	An Overview of the SEC's Authority	792
i.	Setting Standards	792
a.	Investor Protection	793
b.	The Public Interest: Efficiency, Competition, and Capital Formation	793
ii.	Initiating and Conducting Economic Research	794
B.	Recommended SEC Actions to Improve Climate Risk Disclosure	795
i.	Recommendation 1: Develop Institutional Expertise on Climate Risk	795
ii.	Recommendation 2: Coordinate Regulatory Actions Across Agencies ..	797
iii.	Recommendation 3: Draw Best Practices from Existing Frameworks and Standards	800
VII.	CONCLUSION	802

INTRODUCTION

The effects of anthropogenic climate change are unprecedented: the global average surface temperature of the planet is rising at a faster rate than in any other period of human history, shifting weather patterns in unfamiliar and potentially disastrous ways.¹ These changes will profoundly affect the institutions that undergird modern society and will challenge almost every industry and economic sector. Yet most publicly traded companies in the United States do not disclose sufficient information about the risks that climate change poses to their assets and operations. Rather, corporate disclosure of climate risk is often incomplete or nonexistent.

This state of play leaves actors across the financial space vulnerable. When relevant information is obscured or of low quality, lenders and shareholders cannot effectively allocate capital, regulators cannot exercise effective oversight, and companies themselves cannot proactively manage foreseeable threats to their financial health. As a result, our wider financial system is also inadequately prepared to account for the significant risks posed by climate change.² Experts have warned that continued complacency could lead to a “climate bubble” that, upon bursting, would send shockwaves through the economy, resulting in another financial crisis on the scale of the Great Recession.³ For these reasons, the U.S. Commodity Futures Trading Commission Climate-Related Market Risk Subcommittee issued a report (the “CFTC Report”) concluding that climate change “poses a major risk to the stability of the U.S. financial system and to its ability to sustain the

1. Raphael Neukom, Nathan Steiger, Juan José Gómez-Navarro, Jianghao Wang & Johannes P. Werner, *No Evidence for Globally Coherent Warm and Cold Periods over the Preindustrial Common Era*, 571 NATURE 550, 550 (2019); Raphael Neukom, Luis A. Barboza, Michael P. Erb, Feng Shi, Julien Emile-Geay, Michael N. Evans, Jörg Franke, Darrell S. Kaufman, Lucie Lücke, Kira Rehfeld, Andrew Schurer, Feng Zhu, Stefan Brönnimann, Gregory J. Hakim, Benjamin J. Henley, Fredrik Charpentier Ljungqvist, Nicholas McKay, Veronika Valler & Lucine von Gunten, *Consistent Multidecadal Variability in Global Temperature Reconstructions and Simulations over the Common Era*, 12 NATURE GEOSCIENCE 643, 646 (2019); Chelsea Harvey, *Current Warming Is Unparalleled in the Past 2,000 Years*, SCI. AM. (July 25, 2019), <https://www.scientificamerican.com/article/current-warming-is-unparalleled-in-the-past-2-000-years/> [<https://perma.cc/4DHF-XEBS>].

2. *Climate Change and Artificial Intelligence Seen as Risks to Investment Asset Allocation, Finds New Report by BNY Mellon Investment*, BLOOMBERG (Sept. 16, 2019, 8:00 AM), <https://www.bloomberg.com/press-releases/2019-09-16/climate-change-and-artificial-intelligence-seen-as-risks-to-investment-asset-allocation-finds-new-report-by-bny-mellon-investm> [<https://perma.cc/3HSJ-3CZM>].

3. Rostin Behnam, Comm’r, Commodity Futures Trading Comm’n, Opening Statement of Commissioner Rostin Behnam Before the Market Risk Advisory Committee (June 12, 2019), <https://perma.cc/C37G-497S>.

American economy.”⁴ To avoid this result, many U.S. federal, state and municipal agencies must take a variety of actions to improve the financial system’s integration of and resilience to climate risk.⁵

This Article focuses on one agency that will play a major role in addressing the problem: the U.S. Securities and Exchange Commission (“SEC”).⁶ New regulations are needed to bring the quality of climate risk disclosures level with other forms of risk disclosure commonly required of publicly traded companies.⁷ The SEC, as the primary regulator of American securities markets, should mandate that publicly traded companies disclose their climate risk in a manner that is *comparable*, *specific*, and *decision-useful*. This improved disclosure regime will help remedy the vulnerabilities identified above: lenders and shareholders can draw from the disclosures to make informed investment decisions; regulators can more appropriately identify risk and monitor compliance; and companies can consider and mitigate revealed threats. On an economy-wide level, such a regime will help asset prices reflect all relevant information; accurate pricing, in turn, will help investors allocate capital to its risk-adjusted, highest-value use. These improvements in disclosure and risk assessment will mitigate the risks of a “climate bubble” and the significant financial losses that would accompany its bursting.

The SEC already requires corporations to regularly disclose material financial risks in certain categories and has issued guidance acknowledging that climate risk is both material and fits within those categories under some circumstances. However, despite this guidance and the increasing popularity of voluntary climate risk disclosure frameworks and standards, most corporate climate risk disclosures contain incomplete information and/or boilerplate language that does not enable investors to make meaningful comparisons across compa-

4. COMMODITY FUTURES TRADING COMM’N CLIMATE-RELATED MARKET RISK SUBCOMM. OF THE MARKET RISK ADVISORY COMM., *MANAGING CLIMATE RISK IN THE U.S. FINANCIAL SYSTEM* i (2020), <https://perma.cc/UT9M-FG2Y> [hereinafter “CFTC REPORT”].

5. *See, e.g.*, N.Y. Pub. Serv. Comm’n, Order Instituting Proceedings in the Matter Regarding the Need for Reporting Risks Related to Climate Change, Case 20-M-0499 (Oct. 15, 2020), <https://perma.cc/459N-PTJY>.

6. While this Article focuses exclusively on action that the SEC should take, we recognize that there is a much broader set of regulators that can and should take steps to identify and mitigate climate risk. A more holistic approach would, for example, include activity by the Financial Stability Oversight Council or the Commodity Futures Trading Commission.

7. While this Article focuses on the need and authority for new regulations under existing statutes, new legislation related to climate risk disclosure has also been proposed. *See, e.g.*, Climate Risk Disclosure Act of 2019, H.R. 3623, 116th Cong. (2019).

nies. Accordingly, this Article details the need for new, mandatory disclosure requirements and makes recommendations for crafting them. Section II surveys the climate-related risks that corporations will face in the coming century. Section III provides an overview of the existing climate risk disclosure regime, including the SEC's current regulatory requirements and voluntary disclosure frameworks developed by non-governmental organizations. Section IV considers why current regimes have not resulted in comparable, specific, and decision-useful disclosure. Section V explores the benefits of improved climate risk disclosure, including for corporations, investors, markets, and society. Finally, Section VI recommends steps that the SEC should take in the near term to facilitate its promulgation of new, mandatory climate risk disclosure standards—namely, conducting research to increase institutional expertise on climate risk, coordinating with other agencies, and drawing on best practices from existing climate risk disclosure frameworks.⁸ Section VII concludes.

I.

UNDERSTANDING AND IDENTIFYING CLIMATE RISK

Climate-related financial risk comes in a variety of forms but is generally considered to fall into two broad categories: physical risk and transition risk. *Physical risk* refers to the ways in which climate change-amplified and -altered weather patterns can affect corporate assets and operations. *Transition risk* arises from climate change-driven shifts in public policy, technology, or the market.⁹ These risks, and examples of how they affect various sectors of the U.S. economy, are discussed in detail below.

A. *Physical Risk*

Physical risk encompasses the harmful effects of climate change on a corporation's physical assets and operations. These harms can stem from either acute weather events, like hurricanes, or changing

8. After this Article went to press, the SEC proposed a set of mandatory climate risk disclosure requirements. We do not address the substance of that proposal.

9. TASK FORCE ON CLIMATE-RELATED FIN. DISCLOSURES, FINAL REPORT: RECOMMENDATIONS OF THE TASK FORCE ON CLIMATE-RELATED FIN. DISCLOSURES 5–6 (2017) [<https://perma.cc/QR9J-3636>] [hereinafter “TCFD REPORT”]; BLACKROCK, GETTING PHYSICAL: SCENARIO ANALYSIS FOR ASSESSING CLIMATE-RELATED RISKS 7 (2019), <https://perma.cc/3J5C-7DK6>; COUNCIL ON FOREIGN RELS., IMPACT OF CLIMATE RISK ON THE ENERGY SYSTEM: EXAMINING THE FINANCIAL, SECURITY, AND TECHNOLOGY DIMENSIONS 46 (2019), <https://perma.cc/DAZ7-GFRC> [hereinafter “CFR REPORT”].

baseline conditions, like rising seas,¹⁰ and can encompass both direct economic impacts, such as the cost of repairing a damaged facility, and indirect impacts, such as increased insurance premiums for the facility following its repair.¹¹ The financial implications of physical climate risk are massive. The National Oceanic and Atmospheric Administration estimates that the United States has already experienced over \$500 billion in direct economic costs and damages from extreme weather events since 2015.¹² In 2020 alone, there were twenty-two “billion dollar weather events”—extreme weather events that have caused over \$1 billion each in direct economic damage—totaling \$95 billion in damages.¹³ Though already staggering, these estimates understate the magnitude of physical risk because they do not account for indirect impacts such as increased costs of financing or insurance

10. See EUROPEAN BANK FOR RECONSTRUCTION & DEV., ADVANCING TCFD GUIDANCE ON PHYSICAL CLIMATE RISKS AND OPPORTUNITIES 3 (2018), <https://perma.cc/5R6T-3EDY>; TCFD REPORT, *supra* note 9, at 6. Impacts of changing baseline conditions are often referred to as “chronic physical risks.” *Id.*

11. LEE REINERS & CHARLIE WOWK, CLIMATE RISK DISCLOSURE LAB, CLIMATE RISK DISCLOSURES & PRACTICES: HIGHLIGHTING THE NEED FOR A STANDARDIZED REGULATORY DISCLOSURE FRAMEWORK TO WEATHER IMPACTS OF CLIMATE CHANGE ON FINANCIAL MARKETS 15 (2020) [<https://perma.cc/H44E-C7TG>] [hereinafter “DISCLOSURE LAB REPORT”]. This may also include growing risk to the ability of corporations to obtain financing by “damaging assets that serve as collateral for loans or that underpin other investments.” *Id.* at 15–16.

12. *Billion-Dollar Weather and Climate Disasters: Summary Stats*, NAT’L OCEANIC & ATMOSPHERIC ADMIN., <https://www.ncdc.noaa.gov/billions/summary-stats/US/2020> (last visited June 26, 2021) [<https://perma.cc/57XB-638E>]. For more information on the economic impacts of climate change in the United States, see Solomon Hsiang, Robert Kopp, Amir Jina, James Rising, Michael Delgado, Sashank Mohan, D. J. Rasmussen, Robert Muir-Wood, Paul Wilson, Michael Oppenheimer, Kate Larsen & Trevor Houser, *Estimating Economic Damage from Climate Change in the United States*, 356 SCI. 1362, 1362 (2017) [<https://perma.cc/UN9D-PRYS>]. The Climate Impact Lab has also created a Climate Impact Map that provides information on how climate will impact regions of the U.S. differently under various climate projections, using county-level data. See *Climate Impact Map*, CLIMATE IMPACT LAB, <http://www.impactlab.org/map/#usmeas=absolute&usyear=1981-2010&gmeas=absolute&gyear=1986-2005> (last visited June 26, 2021) [<https://perma.cc/9NGM-DF6E>].

13. *Billion-Dollar Weather and Climate Disasters: Overview*, NAT’L OCEANIC & ATMOSPHERIC ADMIN., <https://www.ncdc.noaa.gov/billions/overview> [<https://perma.cc/GQR2-JBSK>] (last visited June 26, 2021); NAT’L OCEANIC & ATMOSPHERIC ADMIN., *supra* note 12. Direct economic impacts include physical damage to private and public structures and assets, business interruptions, disaster restoration costs, and more, both insured and uninsured. *Billion-Dollar Disasters: Calculating the Costs*, NAT’L OCEANIC & ATMOSPHERIC ADMIN., <https://www.ncdc.noaa.gov/monitoring-references/dyk/billions-calculations> [<https://perma.cc/78UA-2M3E>] (last visited June 26, 2021).

premiums, or for costs arising from changes in baseline climate conditions rather than acute weather events.¹⁴

All U.S. regions and industries face physical climate risk, but each will experience it differently.¹⁵ The chemical industry, for example, is especially vulnerable to extreme weather events given that significant assets are located on coasts and waterways, particularly on the Gulf Coast.¹⁶ These impacts are not theoretical. For instance, in 2017, Hurricane Harvey resulted in massive flooding of Arkema's Crosby Facility in Houston.¹⁷ This caused its primary and backup power systems to go offline, preventing cooling of liquid organic peroxides, which exploded as a result.¹⁸ Research has demonstrated that climate change made rainfall from Hurricane Harvey more likely and more intense.¹⁹

Corporations will also face challenges arising from changes in baseline weather conditions. The agricultural industry appears more vulnerable to temperature increases: in the Southwest, productivity of outdoor labor is expected to decrease by five to seven percent by 2100.²⁰ Changing precipitation and evaporation patterns further

14. These estimates also do not consider “losses to natural capital or assets, health care related losses, or values associated with lost life.” Billion-Dollar Disasters, *supra* note 13.

15. See, e.g., Al Shaw, Abraham Lustgarten & Jeremy W. Goldsmith, *New Climate Maps Show a Transformed United States*, PROPUBLICA (Sept. 15, 2020), <https://projects.propublica.org/climate-migration/> [<https://perma.cc/D67M-HATV>].

16. A recent study identified 872 hazardous chemical facilities located on the Gulf Coast alone. Susan C. Anenberg & Casey Kalman, *Extreme Weather, Chemical Facilities, and Vulnerable Communities in the U.S. Gulf Coast: A Disastrous Combination*, 3 GEOHEALTH 122, 122 (2019); see also Zoe Schlanger, *We Placed Our Chemical Plants Near Waterways. That Used to Make Sense. Now It's a Hazard*, QUARTZ (Feb. 7, 2018), <https://perma.cc/KG6L-CYT3>.

17. Harris County's Original Petition and Application for Permanent Injunction at 8–9, *Harris County, Texas v. Arkema, Inc.*, No. 2017-7691 (157th Tx. Judicial D. Nov. 16, 2017).

18. *Id.* at 9.

19. E.g., Geert Jan van Oldenborgh, Karin van der Wiel, Antonia Sebastian, Roop Singh, Julie Arrighi, Friederike Otto, Karsten Haustein, Sihan Li, Gabriel Vecchi & Heide Cullen, *Attribution of Extreme Rainfall from Hurricane Harvey, August 2017*, 12 ENV'T RSCH. LETTERS 1, 10 (2017) [<https://perma.cc/P2B3-JSXM>] (finding that climate change made rainfall from Hurricane Harvey three times more likely and 15% more intense); Mark D. Risser & Michael F. Wehner, *Attributable Human-Induced Changes in the Likelihood and Magnitude of the Observed Extreme Precipitation During Hurricane Harvey*, 44 GEOPHYSICAL RSCH. LETTERS 12,457, 12,457 (2017) [<https://perma.cc/9AMD-PW8U>] (finding precipitation was likely increased by at least 18.8% due to climate change).

20. CERES, ADDRESSING CLIMATE AS A SYSTEMIC RISK: A CALL TO ACTION FOR U.S. FINANCIAL REGULATORS 6 (2020) [<https://perma.cc/U6HK-2QQW>] (citing ENV'T PROT. AGENCY, CLIMATE CHANGE IN THE UNITED STATES: BENEFITS OF GLOBAL ACTION 28 (2015) [<https://perma.cc/6PZ5-487N>]); see also CFTC REPORT,

threaten the industry. Agricultural supply chains may be disrupted, for example, when rivers have too much or too little water to safely support barge traffic carrying crops, seeds, and other materials.²¹

The real estate industry, too, faces a variety of physical risks—with massive implications for property values. Rising seas and flooding could devalue exposed homes by \$30 to \$80 billion in Florida,²² while climate-intensified wildfires could wipe out \$2 trillion in property values in California.²³

Physical risk varies widely not only across sectors, but also across corporations within sectors.²⁴ Each corporation will experience different damages depending on the type and location of its physical assets, infrastructure, and workers, as well as those of its supply chain

supra note 4, at 13 (finding “general agreement that climate change will reduce average yields and total production for most crops in most regions”); *Climate Change and Agriculture: A Perfect Storm in Farm Country*, UNION OF CONCERNED SCIENTISTS (Mar. 20, 2019), <https://www.ucsusa.org/resources/climate-change-and-agriculture> [<https://perma.cc/YA3N-XTCF>].

21. CFTC REPORT, *supra* note 4, at 21.

22. Jonathan Woetzel, Dickson Pinner, Hamid Samandari, Hauke Engel, Mekala Krishnan, Claudia Kampel & Marlies Vasmel, *Will Mortgages and Markets Stay Afloat in Florida*, MCKINSEY GLOBAL INST. (Apr. 27, 2020), <https://www.mckinsey.com/business-functions/sustainability/our-insights/will-mortgages-and-markets-stay-afloat-in-florida> [<https://perma.cc/KAY7-GZCQ>]; *see also* UNION OF CONCERNED SCIENTISTS, UNDERWATER: RISING SEAS, CHRONIC FLOODS, AND THE IMPLICATIONS FOR US COASTAL REAL ESTATE 2 (2018) [<https://perma.cc/2BVT-6VYJ>] (concluding that more than 300,000 coastal homes with a market value of \$117.5 billion today are at risk of “chronic inundation in 2045” and that properties worth more than \$1 trillion could be at risk by 2100).

In 2019, the San Francisco Federal Reserve Bank published a series of articles on climate risk, some of which discussed the concept of “blue-lining,” a practice where lenders refuse to authorize loans for the purchase of homes in locations with unacceptable flood risk. *See* Michael D. Berman, *Flood Risk and Structural Adaptation of Markets*, CMTY. DEV. INNOVATION REV.: STRATEGIES TO ADDRESS CLIMATE CHANGE RISK IN LOW- AND MODERATE-INCOME CMTYS, Oct. 2019 at 13, 16.

23. CERES, *supra* note 20, at 8 (citing Yaling Jiang, *Wildfires Might Erase \$2 Trillion Worth of Housing Value in California*, BARRON’S (Nov. 4, 2019), <https://www.barrons.com/articles/wildfires-might-erase-2-trillion-worth-of-housing-value-in-california-01572882115> (discussing Redfin report analyzing total value of homes at risk of wildfires)).

24. *E.g.*, Rick Lord, Steven Bullock & Murray Birt, *Understanding Climate Risk at the Asset Level: The Interplay of Transition and Physical Risk*, S&P GLOBAL, https://www.spglobal.com/_division_assets/images/special-editorial/understanding-climate-risk-at-the-asset-level/sp-trucost-interplay-of-transition-and-physical-risk-report-05a.pdf [<https://perma.cc/K8VN-87AC>] (last visited Dec. 21, 2020) (“Company exposure and resilience to both transition and physical risk does not conform to clear sectoral patterns, highlighting the need for in-depth analysis to evaluate climate risk at the asset and company level.”); *see also* BLACKROCK, *supra* note 9 (demonstrating how physical risk for sectors can vary across regions).

partners.²⁵ For example, the energy industry has already experienced significant physical effects across regions from a variety of climate change impacts. In the Gulf Coast, the sector has encountered significant damage from climate-amplified flooding and hurricanes. Houston-based Occidental Petroleum alone suffered \$70 million in pre-tax income reduction due to Hurricane Harvey.²⁶ Twelve years prior, Hurricanes Katrina and Rita cost the energy industry \$15 billion.²⁷ With hurricanes growing in severity and reach,²⁸ storm-related impacts in this region are only expected to increase.²⁹

On the East Coast, the energy sector likewise faces a variety of emerging challenges. Rising sea levels put place-bound assets at risk, as New York City utility Consolidated Edison (“ConEd”) highlighted in a 2019 vulnerability study finding that flood heights in ConEd’s service territory are projected to increase from 8.3 feet to 13.3 feet by 2100 due to sea level rise, exposing more of its substations to frequent

25. Physical risk may pose significant concern for corporations whose supply chains involve international actors. For example, the U.S. imports over 90% of its rare earth minerals from China, and these minerals are used to manufacture a wide array of goods, including memory cards, X-ray machines, magnets, catalytic converters, batteries, and cell phones. June Teufel Dreyer, *China’s Monopoly on Rare Earth Elements—and Why We Should Care*, FOREIGN POL’Y RSCH. INST. (Oct. 7, 2020), <https://www.fpri.org/article/2020/10/chinas-monopoly-on-rare-earth-elements-and-why-we-should-care/> [<https://perma.cc/6LEQ-PZGR>]; see also *What Are ‘Rare Earths’ Used For?*, BBC NEWS (Mar. 13, 2012), <https://www.bbc.com/news/world-17357863> [<https://perma.cc/Q2HG-G4LY>]. The regions that produce these minerals, however, have been subject to increasing rates of extreme rainfall, which in turn has increased the risk and severity of landslides, preventing extraction of the necessary materials. The probability of a severe disruption in rare earths production is estimated to double or triple by 2030, placing the supply chains for all of these goods at risk. Jonathan Woetzel, Dickon Pinner, Hamid Samandari, Hauke Engel, Mekela Krishnan, Claudia Kampel & Jakob Graabak, *Could Climate Become the Weak Link in Your Supply Chain*, MCKINSEY GLOB. INST. (Aug. 6, 2020), <https://www.mckinsey.com/business-functions/sustainability/our-insights/could-climate-become-the-weak-link-in-your-supply-chain>, [<https://perma.cc/HG44-8QTZ>].

26. CFR REPORT, *supra* note 9, at 27. Indeed, Houston, home to significant energy sector infrastructure, has seen *three* 1-in-500-year flooding events since 2015. *Id.* at 35.

27. *Id.*

28. See ROGER R. GRENIER, PETER SOUSOUNIS, JON SCHNEYER & DAN RAIZMAN, AIR, QUANTIFYING THE IMPACT FROM CLIMATE CHANGE ON U.S. HURRICANE RISK (2020), https://www.verisk.com/contentassets/307844382ae24e3c9aa9ed4d8d714f60/air_climatechange_us_hurricane_whitepaper.pdf; see also James P. Kossin, Kenneth R. Knapp, Timothy L. Olander & Christopher S. Velden, *Global Increase in Major Tropical Cyclone Exceedance Probability Over the Past Four Decades*, 117 PNAS 11975 (2020) [<https://perma.cc/3GP2-TS2Z>].

29. Lin Li & Panaki Chakraborty, *Slower Decay of Landfalling Hurricanes in a Warming World*, 587 NATURE 230, 230 (2020).

flooding damage.³⁰ Sea level rise and storm surge have also been raised as concerns for nuclear facilities, like Florida Power & Light's ("FPL") existing and planned nuclear reactors at its Turkey Point Facility in southern Florida.³¹ During one licensing hearing for two new nuclear reactors, a Nuclear Regulatory Commission ("NRC") Commissioner raised concerns that FPL used a one foot sea level rise estimate in its design basis, while the National Climate Assessment and other projects suggest sea level rise in south Florida could reach six feet by 2100.³²

Increased drought and longer and more severe heatwaves also pose risk to the energy sector. With respect to drought, CDP (formerly known as Carbon Disclosure Project) conducted a survey of twenty energy companies and found that they had already experienced water-related disruptions to their operations totaling \$1.8 billion in revenue loss due to water scarcity in 2017 alone.³³ Moody's Investor Service has also raised alarm over climate-related water scarcity for utilities, noting early closures of fossil fuel plants could become necessary in drought-prone areas like New Mexico.³⁴ As for heat events, in California, a one-in-thirty five year heat storm caused grid operators to

30. CONSOLIDATED EDISON, CLIMATE CHANGE VULNERABILITY STUDY 3, 47 (2019).

31. *See, e.g.*, Transcript at 121–33, Hearing on Combined Licenses for Turkey Point, Units 6 & 7, No. 52-040-COL (Dec. 12, 2017) [<https://perma.cc/3VYU-PYKE>] (NRC mandatory hearing on combined license application); Memorandum and Order (Ruling on Petitions to Intervene) at 72 n.78, Florida Power & Light Co. (Turkey Point Units 6 & 7), LBP-11-06, (Feb. 28, 2011) (Nos. 52-040-COL and 52-041-COL) [<https://perma.cc/HHD8-WE4D>] (discussing cumulative impacts of sea level rise contention and potential for claims of climate-related design basis flaws).

32. Transcript at 121–33, Hearing on Combined Licenses for Turkey Point, Units 6 & 7, No. 52-040-COL (Dec. 12, 2017) [<https://perma.cc/3VYU-PYKE>] (questioning by NRC Commissioner Baran regarding decision to use a sea level rise estimate at the low end of the National Climate Assessment's predictions). For a broad assessment of the physical risk to electric utility generation assets on a risk-by-risk, plant-by-plant basis, see BLACKROCK, *supra* note 9, at 17.

33. CFR REPORT, *supra* note 9, at 26 (citing CDP's survey).

34. *See* Mike Hughlett, *Moody's Gives Xcel 'Red Flag' for Water Stress Because of Climate Change in Southwest States*, STAR TRIB. (Jan. 22, 2020), <https://www.startribune.com/moody-s-gives-xcel-red-flag-for-water-stress-because-of-climate-change-in-southwest-states/567212732>; ROMANY WEBB, MICHAEL PANFIL & SARAH LADIN, CLIMATE RISK IN THE ELECTRICITY SECTOR: LEGAL OBLIGATIONS TO ADVANCE CLIMATE RESILIENCE PLANNING BY ELECTRIC UTILITIES 21 (2020) [<https://perma.cc/2VU4-26QC>] (citing Kavya Balaraman, *Water Scarcity Accelerates Plans to Close Xcel's Tolk Coal Plant by a Decade*, UTIL. DIVE (Jan. 15, 2020), <https://www.utilitydive.com/news/xcel-energy-plans-shutter-tolk-coal-plant-2032/570456/> [<https://perma.cc/YQ7E-2K3R>]).

engage in rotating outages in summer 2020.³⁵ And in New York, ConEd's vulnerability study found that by 2050 its assets could experience up to twenty-three days per year where temperatures exceed 95°F and twenty-six days where the heat index equals or exceeds 103°F.³⁶ These increased temperatures will result in decreased capacity of ConEd's assets, which were designed to operate in lower temperatures.³⁷ ConEd also reported worker safety concerns due to high heat and the need to increase its HVAC capacity by eleven percent by 2080.³⁸

B. Transition Risk

Corporations are likely to incur substantial costs not only from climate change's physical effects, but also from the actions that society takes in response to those physical effects, such as the adoption of new limits on greenhouse gas emissions or the increase in demand for sustainable products.³⁹ This category of risk, commonly known as *transition risk*, is often divided into several, sometimes overlapping and compounding subcategories, including: policy and legal risk; technology risk; market risk; and reputational risk.⁴⁰ These subcategories are discussed below.

i. Policy and Legal Risk

Corporations will face policy risk as governments take action on climate. This aspect of transition risk "stems from the uncertainty surrounding agreements, rules, and regulations that address transitioning to a low- or net-zero-carbon economy."⁴¹ In the U.S., both state and federal policy changes are likely to significantly affect corporate assets and operations. At the state level, twenty-nine states and the District of Columbia have already established target dates by which electric utilities must provide a set proportion of electricity from renewable or clean energy sources.⁴² The prevalence and aggressiveness

35. CAL. INDEP. SYS. OPERATOR, CAL. PUB. UTILS. COMM'N & CAL. ENERGY COMM'N, PRELIMINARY ROOT CAUSE ANALYSIS: MID-AUGUST 2020 HEAT STORM 5 (2020) [<https://perma.cc/2KV2-K76D>].

36. CONSOLIDATED EDISON, *supra* note 30, at 3.

37. *Id.* at 4.

38. *Id.*

39. TCFD REPORT, *supra* note 9, at 5.

40. *Id.* at 5–6.

41. CFR REPORT, *supra* note 9, at 46.

42. *U.S. State Electricity Portfolio Standards*, CTR. FOR CLIMATE & ENERGY SOLUTIONS, <https://www.c2es.org/document/renewable-and-alternate-energy-portfolio-standards/> [<https://perma.cc/7ZP9-RYP6>] (last updated Nov. 2019).

of these targets has increased in recent years, and fifteen states now aim to achieve one hundred percent clean or renewable energy by 2050 or earlier.⁴³ At the federal level, President Biden has pledged to implement policies to transition the nation to carbon-free electricity generation by 2035, establish greenhouse gas and new fuel economy standards for motor vehicles, and support tax incentives and new finance mechanisms for clean energy.⁴⁴ While the economic impacts of these state and federal policies fall most directly on the energy and automotive sectors, their effects are also felt throughout the broader economy.⁴⁵

Corporations will also face new litigation risk resulting from lawsuits related to corporations' failures to mitigate their climate impacts, adapt to climate change, or sufficiently disclose material financial risks.⁴⁶ The fossil fuel industry and adjacent corporations have faced a substantial increase in lawsuits over the past decade—a more than five-fold increase from the number of cases brought against companies in the 2000s.⁴⁷ Litigation could present a significant financial liability for any company that fails to address new hazards caused by climate change. For example, in 2019, Pacific Gas & Electric (“PG&E”) estimated that it faced \$30 billion in liabilities for its role in

43. Spencer Fields, *100 Percent Renewable Targets*, ENERGY SAGE (May 2, 2019), <https://news.energysage.com/states-with-100-renewable-targets/> [<https://perma.cc/9X9W-TUBJ>]; Sophia Ptacek, *Race to 100% Clean*, NAT. RES. DEF. COUNCIL (Dec. 2, 2020), <https://www.nrdc.org/resources/race-100-clean> [<https://perma.cc/255V-A7BV>].

44. *The Biden Plan to Build a Modern, Sustainable Infrastructure and an Equitable Clean Energy Future*, BIDEN HARRIS, <https://joebiden.com/clean-energy/> [<https://perma.cc/2T8G-SKDH>] (last visited Nov. 24, 2020). While the Biden Administration may face hurdles to enacting portions of his climate plan without new legislation, President Biden can use the existing authority of federal agencies to take action on climate. See, e.g., Umair Irfan, *How Joe Biden Plans to Use Executive Powers to Fight Climate Change*, VOX (Jan. 6, 2021), <https://www.vox.com/21549521/climate-change-senate-election-joe-biden>; Anna M. Phillips, *Five Things Joe Biden Can Do to Fight Climate Change—Without Congress' Help*, L.A. TIMES (Nov. 8, 2020, 3:00 AM), <https://www.latimes.com/politics/story/2020-11-08/five-things-joe-biden-can-do-to-fight-climate-change-without-congress-help>.

45. These types of policies can have implications throughout supply chains by changing the costs of and supply and demand of goods and services. See, e.g., Commission Guidance Regarding Disclosure Related to Climate Change, 75 Fed. Reg. 6290, 6291 (Feb. 8, 2010) [hereinafter “2010 Climate Disclosure Guidance”] (noting corporations may seek to reflect carbon price in goods).

46. TCFD REPORT, *supra* note 9, at 5.

47. See generally *U.S. Climate Change Litigation Database*, SABIN CTR. FOR CLIMATE CHANGE L. AT COLUM. L. SCH., <http://climatecasechart.com/> (last visited Dec. 2, 2020).

climate change-amplified wildfires.⁴⁸ The California Public Utilities Commission ultimately imposed a civil penalty of over \$2 billion,⁴⁹ and, in PG&E's bankruptcy proceedings following the fires, the court approved a \$13.5 billion settlement with wildfire victims.⁵⁰ PG&E is not unique—one analysis of seventeen energy companies estimated that they could face liabilities of \$58 to \$107 billion annually, amounting to between five and twenty percent of the companies' pretax earnings.⁵¹ While the energy sector is already encountering an array of climate-related suits,⁵² corporations in other sectors could also face liability if they fail to disclose and manage the risks of climate change to their business.⁵³

ii. *Technology Risk*

Technological changes also create transition risk. Technological innovation affects corporations' competitiveness, their production and distribution costs, and their revenue streams as demand for their products and services changes.⁵⁴ These changes are particularly salient in the context of climate change, as technological innovation is increasingly resulting in novel zero-carbon products and services. The American coal industry, for example, has seen a sharp decline in production as cleaner energy alternatives like wind and solar—now coupled with advanced technology like energy storage—have become more afford-

48. Steven Mufson, *Inside a California Utility: Mandatory Blackouts Amid Wildfire Threats and Bankruptcy*, WASH. POST (Dec. 21, 2019, 8:19 PM), https://www.washingtonpost.com/climate-environment/inside-pgandes-choices-blackouts-and-the-threat-of-wildfires/2019/12/21/868d58e8-107c-11ea-9cd7-a1becbc82f5e_story.html; Ivan Penn, Lauren Hepler & Peter Eavis, *PG&E Reaches \$13.5 Billion Deal with Wildfire Victims*, N.Y. TIMES (Dec. 6, 2019), <https://www.nytimes.com/2019/12/06/business/energy-environment/pge-wildfire-victims-deal.html>.

49. Cal. Pub. Utils. Comm'n, Investigation 19-06-015: Decision Approving Proposed Settlement Agreement with Modifications, at 2 (May 7, 2020) [<https://perma.cc/FF3M-98JH>].

50. Peg Brickley, *PG&E Wins Court Approval of \$13.5 Billion Deal with Wildfire Victims*, WALL ST. J. (Dec. 18, 2019, 8:51 AM), <https://www.wsj.com/articles/pg-e-wins-court-approval-of-13-5-billion-deal-with-wildfire-victims-11576633923> [<https://perma.cc/24SN-QJ2T>].

51. Cristina Spano, *Guilty by Emission: Courtrooms Are the New Battleground for Climate Activism*, ECONOMIST (Sept. 17, 2020), <https://www.economist.com/special-report/2020/09/17/guilty-by-emission> [<https://perma.cc/VF8U-GMCF>].

52. For a thorough discussion of claims against the energy industry, see WEBB ET AL., *supra* note 34, at 27–30.

53. For a discussion of corporate director fiduciary duties and their intersection with climate risk, see Lisa Benjamin, *The Road to Paris Runs Through Delaware: Climate Change Litigation and Directors' Duties*, 2 UTAH L. REV. 313 (2020) [<https://perma.cc/AMW6-QMLJ>].

54. TCFD REPORT, *supra* note 9, at 6.

able alternatives.⁵⁵ Outside of the energy sector, substitution of products or services with lower emissions options is increasing as well. For example, the development of new plant-based or other meat-alternative products, and lab-cultured meat as a substitute for factory-farmed meats, could pose risk to the industry as consumers look to limit their consumption of highly carbon-intensive meats.⁵⁶

iii. Market and Reputational Risk

Finally, transition risk includes market risk that results from changes in the supply of and demand for products and services.⁵⁷ On the supply side, climate change can increase the cost of raw materials (or make them unavailable), as well as other production costs.⁵⁸ For example, changes in weather patterns could make crops used in clothing production unavailable, affecting the supply of products available.⁵⁹ On the demand side, newly developed “customer preferences for carbon-friendly goods and services” could lead to “rapid losses in the asset values of carbon-focused industries.”⁶⁰ Consumers may also prioritize sustainability, altering demand for products and even moving retailers to shift their product lines.⁶¹ Closely related, reputational risk

55. Fred Pearce, *As Investors Back Away, the Economics of Coal Turn Toxic*, YALE ENVIRONMENT 360 (Mar. 10, 2020), <https://e360.yale.edu/features/as-investors-and-insurers-back-away-the-economics-of-coal-turn-toxic> [<https://perma.cc/6M25-3MES>].

56. See, e.g., Julia B. Olayanju, *Plant-Based Meat Alternatives: Perspectives on Consumer Demands and Future Directions*, FORBES (July 30, 2019, 12:07 PM), <https://www.forbes.com/sites/juliabolayanju/2019/07/30/plant-based-meat-alternatives-perspectives-on-consumer-demands-and-future-directions/?sh=535cd73d6daa> [<https://perma.cc/52RV-YWFN>]; *Our Meatless Future: How the \$2.7T Global Meat Market Gets Disrupted*, CBINSIGHTS (July 15, 2020), <https://www.cbinsights.com/research/future-of-meat-industrial-farming/> [<https://perma.cc/V7EZ-9U6Y>]; Agnieszka de Sousa, *Lab-Grown Meat Is Getting Closer to Supermarket Shelves*, BLOOMBERG (Dec. 9, 2020, 7:01 PM), <https://www.bloomberg.com/news/articles/2020-12-10/lab-meat-is-getting-closer-to-supermarket-shelves> [<https://perma.cc/7S3F-8W3R>].

57. TCFD REPORT, *supra* note 9, at 6.

58. *Id.* at 10.

59. See, e.g., BSR & KERING, CLIMATE CHANGE: IMPLICATIONS AND STRATEGIES FOR THE LUXURY FASHION SECTOR 3 (2015), <https://perma.cc/Z2H6-5HMV> (“Fashion companies rely on agricultural production for their raw materials. This is where climate change will have significant consequences through temperature changes, water scarcity, and impact from catastrophic climatic events, such as cyclones and droughts. Luxury fashion has additional vulnerabilities because raw material quality is critical to create outstanding products and because some of these materials derive from nature-based systems and ecological processes that can be easily disrupted by climate change.”).

60. DISCLOSURE LAB REPORT, *supra* note 11, at 17.

61. See, e.g., Randi Kronthal-Sacco & Tensie Whelan, *Sustainable Share Index: Research on IRI Purchasing Data (2013-2018)*, NYU STERN CTR. FOR SUSTAINABLE BUS. (Mar. 11, 2010), <https://perma.cc/2MSF-MS5M> (finding that “[p]roducts mar-

could also affect the demand for products from carbon-intensive industries.⁶² That is, in response to stigmatization of carbon-intensive sectors, consumers may seek out corporations that they perceive as embracing or furthering the energy transition and avoid those seen as laggards.⁶³

* * * * *

The physical and transition risks detailed above implicate the financial and operational well-being of a wide range of U.S. corporations. Thus, these risks should be clearly disclosed in corporate financial reports. However, as the following section makes clear, neither the SEC's existing disclosure rules nor the array of voluntary frameworks and standards created to supplement those regulatory requirements currently elicit sufficient disclosures.

III.

EXISTING SEC REGULATORY REQUIREMENTS AND VOLUNTARY FRAMEWORKS

The SEC requires every public corporation in the U.S. to file annual and quarterly reports that disclose a variety of information regarding the corporation's financial health and its exposure to risk.⁶⁴ As the evidence explored in Section II makes clear, climate risk has significant implications for U.S. corporations, and foreseeable physical and transition risks associated with climate change impacts—and related risk management strategies and actions—should thus be disclosed in annual and quarterly filings. Indeed, in 2010 the SEC released guidance specifically on disclosure of climate risk (“2010 Climate Disclosure Guidance” or “2010 Guidance”).⁶⁵ Yet, as described more fully below in the last part of this Section, publicly

keted as sustainable . . . [g]rew 5.6x faster than products not marketed as sustainable”); Karl Haller et al., *Meet the 2020 Consumers Driving Change*, IBM INST. FOR BUS. VALUE (June 24, 2020), <https://perma.cc/FT45-73NL>.

62. TCFD REPORT, *supra* note 9, at 6.

63. EDF recently unveiled its Climate Authenticity Meter, which “rates how companies and industry groups’ lobbying activities support or obstruct progress on climate policy.” Press Release, Env’t Def. Fund, EDF Launches New Tool to Highlight Corporate Action on Climate Policy (Oct. 1, 2020), <https://perma.cc/9HZC-9H7J>. This tool could be used by consumers to understand whether corporations are going beyond committing to individual mitigation strategies to also support necessary climate-related public policies, and make purchasing decisions on this basis.

64. *See generally* 17 C.F.R. Part 229 (2021); *see also* Ruth Jebe, *The Convergence of Financial and ESG Materiality: Taking Sustainability Mainstream*, 56 AM. BUS. L.J. 645, 654–61 (2019).

65. 2010 Climate Disclosure Guidance, *supra* note 45, at 6291.

traded companies currently do not make *comparable*, *specific*, and *decision-useful* climate risk disclosure.

While the following decade saw a spike in costly climate-induced disasters and more widespread acknowledgement of the financial nature of climate risk, the SEC has not taken action since 2010 to improve upon the issued guidance. In the absence of SEC activity, a variety of voluntary frameworks and standards have emerged. Two of the most adopted examples are discussed in the second part of this Section: The Task Force on Climate-Related Financial Disclosures (“TCFD”) framework and the sector specific standards for environmental, social, and corporate governance (“ESG”) disclosures, including climate risk disclosures established by the Sustainability Accounting Standards Board (“SASB”). The SEC’s 2010 Guidance was significant in acknowledging climate risk and the emergence of voluntary frameworks and standards have been instrumental in forward progress. However, as detailed in the third part of this Section, the current patchwork approach to climate risk disclosure has not led to a sufficient quantity or quality of information for investors, regulators, and other interested stakeholders. This Article considers sufficient disclosure to mean disclosure that is *comparable*, *specific*, and *decision-useful*. These elements necessarily overlap, but each has particular meaning and is designed to incorporate and reflect the core disclosure principles set out by various governmental entities and voluntary regimes.⁶⁶

Comparable, *specific*, and *decision-useful* disclosures allow investors to make more informed decisions and allow regulators to more effectively carry out their responsibilities. *Comparable* disclosures are provided in a manner that allows users, like investors and regulators, to understand how corporations compare with one another in risk and performance.⁶⁷ This is also useful for the corporation itself as a

66. See, e.g., TCFD REPORT, *supra* note 9, at 51–54 (providing seven principles of effective disclosure); Guidelines on Non-Financial Reporting (Methodology for Reporting Non-Financial Information), 2017 O.J. (C 215) 5–9 [hereinafter 2017 EU Guidance] (laying out key principles of disclosure); SUSTAINABILITY ACCOUNTING STANDARDS BD., SASB CONCEPTUAL FRAMEWORK 9 (2017) [<https://perma.cc/C6AH-F9N4>] [hereinafter “SASB CONCEPTUAL FRAMEWORK”] (noting information disclosed under the standards should be material, decision-useful, and cost-effective).

67. TCFD REPORT, *supra* note 9, at 18, 53 (providing principles of disclosure including, “disclosures should be comparable among companies within a sector, industry, or portfolio,” meaning “disclosures should allow for meaningful comparisons of strategy, business activities, risks, and performance across organizations and within sectors and jurisdictions”); CFTC REPORT, *supra* note 4, at 91 (“Large companies are increasingly disclosing some climate-related information, but vary significantly in the

benchmarking tool against competitors.⁶⁸ Comparability demands consistency and standardization in what, where, and how information is provided. Balancing comparability with the other necessary characteristics of sufficient disclosure—specificity and decision-usefulness—will require industry-based standardization of disclosure rules.⁶⁹ *Specific* disclosures provide information that is particular to the corporation, rather than what can be generally applicable to any corporation. Disclosure should also balance the need for comparable industry-level information with granular information about possible impacts on the individual corporation and its assets.⁷⁰ Specificity must also be balanced with efficiency and cost concerns for preparers. Lastly, *decision-useful* disclosures are of a kind and quality that allows users to “integrate climate risk into their decision-making.”⁷¹ Relevant decisions include not just those regarding whether and how much to invest, but also ownership, engagement, and proxy voting-related decisions.⁷²

specific information they disclose, presenting a challenge for investors and others seeking to understand exposure to and management of climate risks.”).

68. CFTC REPORT, *supra* note 4, at 91 (“For all industries in which climate risk is material, the lack of comprehensive and comparable disclosure not only poses a challenge to investors seeking to assess, manage, and mitigate climate risk, but it also impedes the ability of disclosing organizations to inform their strategic responses to climate risk by benchmarking their performance against peer organizations.”).

69. SASB CONCEPTUAL FRAMEWORK, *supra* note 66, at 5, 7 (explaining its focus on industry-specific standards to allow useful comparison); TCFD REPORT, *supra* note 9, at 18 (calling for comparable disclosure among sectors or industries); *see also* SUMMARY REPORT OF THE PUBLIC CONSULTATION ON THE REVIEW OF THE NON-FINANCIAL REPORTING DIRECTIVE: 20 FEBRUARY 2020 – 11 JUNE 2020, at 18–19 (2020) [<https://perma.cc/M2PB-6BDD>] [hereinafter “NFRD CONSULTATION SUMMARY”] (“80% of all respondents favour the inclusion of sector-specific elements in a reporting standard.”).

70. SASB describes this as a balance between corporation and industry-level information, in discussing “company-tailored disclosures.” This is disclosure where the “company provides disclosure using specific language that can only be understood in the context of the issuer” and is “tailored to reflect the company’s specific and unique circumstances” but does not “provide information allowing for quantitative comparisons between companies.” SUSTAINABILITY ACCOUNTING STANDARDS BD., THE STATE OF DISCLOSURE 2017: AN ANALYSIS OF THE EFFECTIVENESS OF SUSTAINABILITY DISCLOSURE IN SEC FILINGS 7 (2017), [<https://perma.cc/USC8-2HN2>] [hereinafter “SASB STATE OF DISCLOSURE”]. Disclosure using metrics that provide information specific to the corporation but relevant to the sector allows comparison.

71. CFTC REPORT, *supra* note 4, at 88.

72. *See, e.g.*, SASB CONCEPTUAL FRAMEWORK, *supra* note 66, at 10–11.

A. *SEC Regulation S-K, Form 10-K, and the 2010 Climate Disclosure Guidance*

Corporate financial disclosure requirements are governed by Regulation S-K and Regulation S-X, both promulgated under the U.S. Securities Act of 1933.⁷³ Broadly speaking, these regulations require public corporations to disclose a wide range of financial and nonfinancial information about their operations when that information is material. S-K largely deals with qualitative, textual disclosure while S-X focuses on financial statements.⁷⁴ These mandatory disclosures are made through standard “forms,” including Form 10-K, a detailed annual reporting requirement that is intended to elicit a comprehensive summary of a company’s history, structure, executive compensation, and financial performance.⁷⁵

Two aspects of the SEC’s current disclosure regime are significant in the context of climate risk. First is the concept of *materiality*—the standard that governs disclosure for most categories of information included in an annual report. Whether climate risk is material to a corporation is the primary question that drives whether and to what extent climate risk is disclosed under current rules. Second is the SEC’s 2010 Climate Disclosure Guidance, which identified specific categories of climate risk that could be material and specific Form 10-K line items to which the categories could be relevant.

i. *The Materiality Standard*

The concept of materiality plays an important role in determining what information must be disclosed under Regulation S-K and Regulation S-X.⁷⁶ Materiality is also a key element of securities fraud,

73. ALEXANDER F. COHEN ET AL., FINANCIAL STATEMENT REQUIREMENTS IN US SECURITIES OFFERINGS: WHAT YOU NEED TO KNOW 1 (2020) [<https://perma.cc/YG7H-36CX>].

74. *Id.*

75. *How to Read a 10-K/10-Q*, SEC. & EXCHANGE COMM’N (JAN. 26, 2021), <https://www.sec.gov/fast-answers/answersreada10khtm.html>.

76. *See* 17 C.F.R. § 229.101(a)(1) (“In describing developments, only information material to an understanding of the general development of the business is required.”); *id.* § 229.103(a) (“Describe briefly any material pending legal proceedings, other than ordinary routine litigation incidental to the business, to which the registrant or any of its subsidiaries is a party or of which any of their property is the subject.”); *id.* § 229.105(a) (“Where appropriate, provide under the caption ‘Risk Factors’ a discussion of the material factors that make an investment in the registrant or offering speculative or risky.”); *id.* § 210.4-01(a) (“The information required with respect to any statement shall be furnished as a minimum requirement to which shall be added any further material information as is necessary to make the required statements, in light of the circumstances under which they are made, not misleading.”).

which is governed by a separate regulation—Rule 10b-5. Under Rule 10b-5, if a court finds that a corporation has failed to disclose a material fact, the corporation can be held civilly or criminally liable.⁷⁷ In a landmark 1976 decision clarifying the 10b-5 materiality standard, the Supreme Court explained that a fact is material if there is a

substantial likelihood that, under all the circumstances, [it] would have assumed actual significance in the deliberations of the reasonable shareholder. Put another way, there must be a substantial likelihood that the disclosure of the omitted fact would have been viewed by the reasonable investor as having significantly altered the “total mix” of information made available.⁷⁸

The Court has subsequently characterized the test as intended to “filter out essentially useless information that a reasonable investor would not consider significant, even as part of a larger ‘mix’ of factors to consider in making his investment decision.”⁷⁹ In the context of a potential merger, the Court further held that for “contingent or speculative information or events,” the materiality standard is applied by balancing “the indicated probability that the event will occur and the anticipated magnitude of the event in light of the totality of the company activity.”⁸⁰

These Court decisions did not discuss limits on the SEC’s authority to require disclosure of non-material information under Regulation S-K or S-X, but the SEC incorporated the Court’s holdings on materiality in a 1999 Staff Accounting Bulletin, which stated that “the omission or misstatement of an item in a financial report is material if, in the light of surrounding circumstances, the magnitude of the item is such that it is probable that the judgment of a reasonable person relying upon the report would have been changed or influenced by the inclusion or correction of the item.”⁸¹

77. 17 C.F.R. § 240.10b-5. The Supreme Court has long recognized that a private cause of action exists for violations of Section 10(b) and Rule 10b-5. *Basic Inc. v. Levinson*, 485 U.S. 224, 230–31 (1985).

78. *TSC Industries, Inc. v. Northway, Inc.*, 426 U.S. 438, 449 (1976). Although the Supreme Court in *TSC* was interpreting the term “materiality” as used in Rule 14a-9 (implementing Section 14(a) of the Securities Exchange Act on proxy solicitation), the Supreme Court concluded in *Levinson*, that this standard was appropriate in the context of Rule 10b-5 (implementing Section 10(b) of the Act), as well.

79. *Levinson*, 485 U.S. at 234.

80. *Id.* at 238 (accepting test from *SEC v. Texas Gulf Sulphur Co.*, 401 F.2d 833, 849 (2d Cir. 1968)).

81. DISCLOSURE LAB REPORT, *supra* note 11, at 28 (citing SEC Staff Accounting Bulletin No. 99, 64 Fed. Reg. 45,150 (Aug. 19, 1999)). Accounting Bulletins “reflect the Commission staff’s views regarding accounting-related disclosure practices. They represent interpretations and policies followed by the Division of Corporation Finance and the Office of the Chief Accountant in administering the disclosure requirements

Materiality can be an elusive concept in any context because of the discretion it affords to corporations in determining what information is material.⁸² When a rule gives a company the flexibility to withhold information if it is “not material,”⁸³ there are no bright-line rules for determining what *is* material, and there are no degrees of materiality—information is either material or it is not.⁸⁴ Along with a lack of insight into corporations’ materiality assessment processes,⁸⁵ these aspects make it difficult to assess or second-guess materiality determinations. In the climate context, deference to a corporation’s materiality determination may be magnified by the inability to rigorously assess those determinations, as the SEC has not historically staffed internal climate expertise.⁸⁶

While this Article primarily considers SEC authority to require disclosure of material information to improve climate risk disclosures, it does not foreclose the other avenues available for the SEC to take action. The materiality standard is a self-imposed limitation on the typical scope of the SEC’s disclosure requirements and the Commission has occasionally required disclosures untethered from a material-

of the federal securities laws.” *Selected Staff Accounting Bulletins*, SEC. & EXCHANGE COMM’N (Jan. 8, 2021), <https://www.sec.gov/regulation/staff-interpretations/accounting-bulletins> [<https://perma.cc/HMW6-MNBL>].

82. Rick E. Hansen, *Climate Change Disclosure by SEC Registrants: REvisiting the SEC’s 2010 Interpretive Release*, 6 BROOK. J. CORP. FIN. & COM. L. 487, 502 (2012) [<https://perma.cc/U4TJ-5P37>]; Virginia Harper Ho, “*Comply or Explain*” and the Future of Nonfinancial Reporting, 21 LEWIS & CLARK L. REV. 317, 328 (2017) [<https://perma.cc/5QS2-BPD8>] (“For purposes of financial reporting, the materiality of ESG information is a determination over which corporate management has discretion, so ESG issues may be under-reported, particularly if firms are not adequately identifying and monitoring ESG risk.”).

83. *See supra* note 76.

84. Hana V. Vizcarra, *The Reasonable Investors and Climate-Related Information: Changing Expectations for Financial Disclosures*, 50 ENVTL. L. REP. 10106, 10112 (2020) [<https://perma.cc/AJU6-QDKH>].

85. The materiality concept is a difficult standard to assess because the SEC often lacks information about how these materiality determinations are made and is therefore unable to push back on the materiality determinations made by individual corporations. Corporations are not required to disclose their materiality assessment process, limiting investor and regulator access to the processes underlying disclosure and providing companies significant discretion in making disclosure decisions. Hana V. Vizcarra, *Climate Related Disclosure and Litigation Risk in the Oil & Gas Industry: Will State Attorneys General Investigations Impede the Drive for More Expansive Disclosures?*, 43 VT. L. REV. 733, 758 (2019) [<https://perma.cc/93ZS-283K>] (“SEC’s enforcement role with regard to disclosures is limited by the information it can review. The division of the agency that reviews disclosures for compliance with SEC rules does not have subpoena power, *does not have access to the underlying information that companies consider in making their materiality determinations*, and has little training in climate-related disclosure.” (emphasis added)).

86. *Id.*

ity assessment.⁸⁷ Consideration of SEC pathways not premised upon materiality are, however, beyond the scope of this Article.

ii. *The 2010 Climate Disclosure Guidance*

In 2010, the SEC made clear that climate risk may be material to corporations in some circumstances and thus subject to disclosure under Regulation S-K.⁸⁸ The 2010 Climate Disclosure Guidance identified four specific portions of Form 10-K where climate risk could be relevant. While the SEC finalized amendments to these sections in 2020,⁸⁹ the 2010 Guidance remains the most relevant statement from

87. Academic authors have argued that the SEC is not bound exclusively to the materiality standard. *See, e.g.,* Hillary A. Sale, *Disclosure's Purpose*, 107 GEO. L.J. 1045 (2019) [<https://perma.cc/978E-A8U8>] (arguing the SEC has authority to require disclosure in the public interest). The CFTC report also recommended that financial regulators like the SEC “consider additional, appropriate avenues for firms to disclose other substantive climate risks that do not pass the materiality threshold over various time horizons.” CFTC REPORT, *supra* note 4, at 132. However, as argued below, without going beyond the bounds of materiality, the SEC should acknowledge that the changing structure of capital markets means that what the “reasonable investor” considers material includes information related to systematic, non-diversifiable, risks, including climate-related risks. John C. Coffee, *The Future of Disclosures: ESG, Common Ownership, and Systematic Risk* (European Corp. Governance Inst. Law, Working Paper No. 541/2020, 2021) [<https://perma.cc/R7GS-KZCH>] (arguing that SEC has authority to require disclosure of systemic risks); *see also* INST. FOR POL’Y INTEGRITY, CORPORATE CLIMATE RISK: ASSESSMENT, DISCLOSURE, AND ACTION CONFERENCE BRIEF 12–13 (2021) [<https://perma.cc/N5BB-CLBT>] [hereinafter “POL’Y INTEGRITY CONFERENCE BRIEF”] (summarizing remarks by Robert Jackson, former SEC commissioner); Inst. for Pol’y Integrity, *Keynote Remarks by Rob Jackson (with Richard Revesz)*, at 19:34, YOUTUBE (Oct. 6, 2020), <https://www.youtube.com/watch?v=YXVaz-x7Ans> (arguing that the SEC’s authority under the Securities Exchange Act of 1934 is sufficiently expansive to encompass disclosures related to systemic rather than corporation-specific risk and noting that the Commission, in fact, required disclosures of some systemic risks in a 2010 rulemaking).

88. 2010 Climate Disclosure Guidance, *supra* note 45, at 6290.

89. Critics of the 2020 amendments to Regulation S-K observed that it did not “make any attempt to address investors’ need for standardized disclosure on climate change risk.” *See* Modernization of Regulations S–K Items 101, 103, and 105, 85 Fed. Reg. 63,726, 63,742 (Oct. 8, 2020); Public Statement, Allison Herren Lee, Comm’r, Securities & Exchange Comm’n, “Modernizing” Regulation S-K: Ignoring the Elephant in the Room (Jan. 30, 2020), <https://www.sec.gov/news/public-statement/lee-mds-2020-01-30> [<https://perma.cc/PCY5-DVP6>]. The SEC finalized amendments to various portions of Regulation S-K that effectively shifted disclosure to more heavily rely upon a “principles-based” approach, which can be contrasted with line-item disclosure. *Line-item disclosure* is a fairly prescriptive approach that utilizes “bright-line, quantitative or other thresholds to identify when disclosure is required or require registrants to disclose the same types of information.” *Principles-based disclosure*, by contrast, provides greater flexibility to corporations to determine “(1) whether certain information is material, and (2) how to disclose such information.” Principles-based disclosure “articulates a disclosure ‘concept’ rather than a hard rule.” *See, e.g.,* Jay Knight, *Recent SEC Comment Letter Reveals the Difference Between*

the SEC on climate risk disclosure and the general principles it established remain in place. In relevant part, the 2010 Guidance included the following requirements:

- Item 101: Description of Business. Item 101 requires a corporation to describe its general development, as well as its “form of organization, principal products and services, major customers, and competitive conditions.”⁹⁰ Potentially relevant provisions include “the material effects that compliance with Federal, State and local provisions . . . may have upon the capital expenditures, earnings and competitive position of the registrant and its subsidiaries.”⁹¹
- Item 103: Legal Proceedings. Item 103 requires corporations to “describe briefly any material pending legal proceedings, other than ordinary routine litigation . . . to which the registrant or any of its subsidiaries is a party or of which any of their property is the subject.”⁹²
- Item 303: Management’s Discussion and Analysis of Financial Condition and Results of Operations (MD&A). Item 303 provides an opportunity for the corporation to “communicate to

Prescriptive-Based and Principles-Based Rules, BASS BERRY SIMMS (Nov. 5, 2020), <https://www.bassberrysecuritieslawexchange.com/prescriptive-based-principles-based-rules-securities-exchange-commission-sec-comment-letter/> [<https://perma.cc/4ETY-A8LE>].

The 2020 amendments were criticized by Commissioners Lee and Jackson, who shared two primary concerns: principles-based disclosure (1) “gives company executives discretion over what they tell investors” and (2) “can produce inconsistent information that investors cannot easily compare.” Public Statement, Robert J. Jackson & Allison Herren Lee, Comm’rs, Securities & Exchange Comm’n, Joint Statement of Commissioners Robert J. Jackson, Jr. and Allison Herren Lee on Proposed Changes to Regulation S-K (Aug. 27, 2019), <https://www.sec.gov/news/public-statement/statement-jackson-lee-082719> [<https://perma.cc/5RK7-RV24>]. To ensure that future regulations yield comparable, specific, and decision-useful disclosures of climate risk, the SEC should thus carefully consider how to balance line-item and principles-based disclosure requirements.

90. 2010 Climate Disclosure Guidance, *supra* note 45, at 6293; 17 C.F.R. Part 229 § 101.

91. 17 C.F.R. Part 229 § 101(c)(1)(xii) (2008). Additionally, while not noted in the guidance, this item also required disclosure of the “[s]ources and availability of raw materials[.]” *Id.* § 101(c)(1)(iii) (2008). This requirement was retained in the 2020 amendments but explicitly limited to encompass only those resources “material to a registrant’s business.” *Id.* § 229.101(c)(1)(iii)(A) (2020).

92. *Id.* § 229.103(a). Later regulatory amendments have added that disclosure of environmental legal proceedings is required (and not subject to the “ordinary litigation” exception) if it “involves potential monetary sanctions of \$300,000 or more, or at the election of the registrant, *such other amount* that that the registrant determines is reasonably designed to result in disclosure of any such proceeding that is material to its business or financial condition.” Modernization of Regulations S-K Items 101, 103, and 105, 85 Fed. Reg. 63,726, 63,742 (Oct. 8, 2020); DISCLOSURE LAB REPORT, *supra* note 11, at 30.

shareholders management's view of the company's financial condition and prospects."⁹³ This item requires disclosure of "material events and uncertainties known to management that would cause reported financial information not to be necessarily indicative of future operating results or of future financial condition."⁹⁴ A "trend, demand, commitment, event or uncertainty" must be disclosed if the corporation cannot affirmatively determine that it is not reasonably likely to occur and not reasonably likely to have a material effect.⁹⁵

- Item 503(c): Risk Factors.⁹⁶ Item 503(c) requires registrants to provide "a discussion of the most significant factors that make the offering speculative or risky."⁹⁷ Registrants are encouraged to focus on risks that are unique or specific to their businesses, rather than general risks that are associated with the market as a whole.⁹⁸

The 2010 Guidance also identified four categories of climate risk for reporting corporations to consider: (1) compliance and litigation issues with *legislation and regulation*; (2) compliance and litigation issues with *international accords*; (3) the *indirect consequences of*

93. 2010 Climate Disclosure Guidance, 75 Fed. Reg. at 6294. This item is intended to accomplish three principal objectives: (1) "enabl[ing] investors to see the company through the eyes of management," (2) "provid[ing] the context within which financial information should be analyzed," and (3) providing information about earnings and cash flow that allows investors to "ascertain the likelihood that past performance is indicative of future performance." *Id.* (emphasis added).

94. DISCLOSURE LAB REPORT, *supra* note 11, at 31. Notably, this item is intended to be forward looking and the Commission has not provided any specific time horizon that should be assessed, but has instead left that decision to the company under the circumstances. 2010 Climate Disclosure Guidance, 75 Fed. Reg. at 6294.

95. 2010 Climate Disclosure Guidance, 75 Fed. Reg. at 6295. The SEC uses a two prong test, in which management must make two determinations. The first determination is the likelihood of occurrence, the second is the likelihood of material effect if it occurs. Management must determine how likely it is to occur: "[i]f management determines that it is not reasonably likely to occur, no disclosure is required. [But] if management cannot make that determination, it must evaluate objectively the consequences of the known trend, demand, commitment, event or uncertainty, on the assumption that it will come to fruition. Disclosure is then required unless management determines that a material effect on the registrant's financial condition or results of operations is not reasonably likely to occur." *Id.*

96. This item has been moved to new item 105 with some changes. *See* Modernization of Regulations S-K Items 101, 103, and 105, 85 Fed. Reg. 63,726, 63,742–46 (Oct. 8, 2020). Because this Section of the report is intended to discuss the 2010 Guidance, it continues to use item 503 throughout when discussing the Risk Factors disclosure requirement. However, there are important changes to note. First, item 105 replaces "most significant" with "material" in identifying which factors must be discussed. *Id.* Second, item 105 eliminates the requirement to disclose "unique or specific" information, in favor of more general risk. *Id.*

97. 17 C.F.R. § 229.503(c) (2008).

98. 2010 Climate Disclosure Guidance, 75 Fed. Reg. at 6294.

regulation or business trends, such as decreased demand for products or the public perception associated with emissions; and (4) *physical impacts*, like property damage or the disruptions in supply chains and operations of customers.⁹⁹ For each of these categories, the SEC provided specific examples and explained how they might trigger disclosure under the four line items.¹⁰⁰

B. Voluntary Frameworks and Standards: TCFD and SASB

A variety of voluntary disclosure standards and frameworks have been developed as supplements to the SEC regulations and guidance described above. This Section discusses two of the most adopted voluntary efforts: the TCFD framework and the SASB standards. Although developed by separate entities, the two tools are best understood as complementary. The TCFD framework is just that: a framework. It sets forth core elements and broad disclosure recommendations. It explicitly does not, however, “develop any detailed, industry-specific standards or metrics for disclosing [climate-related] risks.”¹⁰¹ Granular voluntary standards, including but not limited to the SASB standards, are being used to fill in this detail.¹⁰² And while

99. *Id.* at 6295–97. The first two align well with the legal and policy transition risks, the third with the technological, market, and reputational transition risks, and the fourth with physical risk, each discussed in Section II.

100. For example, potential domestic and international law may trigger disclosure under all items. Potential climate change legislation and regulation may need to be disclosed under both Items 303 and 503(c). *Id.* at 6295–96. As to the indirect consequences of regulation or business trends, 503(c) may require disclosure of reputational risks—where public perception of a corporation’s contribution to climate change could expose it to adverse consequences on operations or financial conditions, that should be disclosed. *Id.* Both Item 101 and the MD&A may require disclosure of climate-related changes in demand for goods and services or increases in competition. *Id.* The 2010 Guidance is also clear that physical effects of climate change can affect a corporation’s operations and results, which could potentially trigger disclosure as a risk under 503(c) or the MD&A. *Id.* at 6296–97. Because “severe weather can have a devastating effect on the financial condition of affected businesses,” vulnerable companies should disclose relevant climate risk. *Id.* at 6297.

101. DISCLOSURE LAB REPORT, *supra* note 11, at 40. The TCFD has provided a few sectors with some guidance, however. See TASK FORCE ON CLIMATE-RELATED FIN. DISCLOSURES, IMPLEMENTING THE RECOMMENDATIONS OF THE TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES 52–55 (2017) [<https://perma.cc/KA7E-6WYL>].

102. Some of the other prominent standard setters include CDP, the Climate Disclosure Standards Board (“CDSB”), the Global Reporting Initiative, and the International Integrated Reporting Council. We do not take a position on the relative value of each of these, which have different standards and purposes. For more information on each of these standards and how they align, see CDP ET AL., STATEMENT OF INTENT TO WORK TOGETHER TOWARDS COMPREHENSIVE CORPORATE REPORTING 7 (2020) [<https://perma.cc/L9Y2-8U3S>] [hereinafter “STANDARD SETTER STATEMENT OF INTENT”].

the SASB standards were not developed for the express purpose of supplementing the TCFD framework, SASB has published guidance explaining how they can be used in conjunction.¹⁰³

i. The TCFD Framework

The TCFD was established in 2015 by the Financial Stability Board, an international organization with members from twenty-four of the world's major economies, and representatives from oversight organizations such as the European Central Bank and the International Monetary Fund.¹⁰⁴ The TCFD's stated purpose is "to develop recommendations for more effective climate-related disclosures that could promote more informed investment, credit, and insurance underwriting decisions" and that "would enable stakeholders to understand better the concentrations of carbon-related assets in the financial sector and the financial system's exposures to climate-related risks."¹⁰⁵

In 2017, the TCFD published its final report establishing a voluntary framework for disclosure of potential financial impacts of climate risk.¹⁰⁶ It provides detailed examples of climate risk and the financial impacts that may result.¹⁰⁷ It also clarifies that disclosure should be made in annual financial filings, not in supplemental sustainability reports.¹⁰⁸ A key feature of the report's recommendations is their generality: the disclosure recommendations are intended to be "widely adoptable" and "applicable to organizations across all sectors and ju-

103. Press Release, Sustainability Accounting Standards Bd., SASB and CDSB Release Handbook, Highlighting Real-World Reporting on Climate-Related Financial Risks and Opportunities (Sept. 23, 2019) [<https://perma.cc/P77L-XFH6>] (explaining the handbook is intended "carry the TCFD's work forward" and to align their own tools with the TCFD's recommendations). SASB and the CDSB describe the relationship of the TCFD framework, CDSB framework and SASB standards as follows:

The TCFD recommendations serve as a global foundation for effective climate related disclosures. The CDSB Framework helps organizations integrate and disclose financially material climate and natural capital-related information into their annual reports. The SASB standards help organizations to collect, structure, and effectively disclose related performance data for the material, climate-related risks and opportunities they have identified.

CLIMATE DISCLOSURE STANDARDS BD. & SUSTAINABILITY ACCOUNTING STANDARDS BD., TCFD IMPLEMENTATION GUIDE 4 (2019) [<https://perma.cc/9JT3-URSV>].

104. *Members of the FSB*, FIN. STABILITY BD. (Dec. 9, 2020) [<https://perma.cc/YH9U-QQ7A>].

105. TASK FORCE ON CLIMATE-RELATED FIN. DISCLOSURES, TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES: OVERVIEW 7 (2020) [<https://perma.cc/Q4V6-DK56>].

106. TCFD REPORT, *supra* note 9.

107. *E.g., id.* at 10–11.

108. *Id.* at 17.

risdictions.”¹⁰⁹ The framework is structured around four core elements: (1) “the organization’s governance around climate-related risks and opportunities” (governance); (2) “the actual and potential impacts of climate-related risks and opportunities on the organization’s businesses, strategy, and financial planning” (strategy); (3) “the processes used by the organization to identify, assess, and manage climate-related risks” (risk management); and (4) “the metrics and targets used to assess and manage relevant climate-related risks and opportunities” (metrics and targets).¹¹⁰

Within these core elements, the TCFD recommends eleven specific disclosures. Under governance, the TCFD asks all corporations to “[d]escribe the board’s oversight of climate-related risks and opportunities,” and “management’s role in assessing and managing” these risks and opportunities.¹¹¹ For strategy, corporations should “[d]escribe the climate-related risks and opportunities the organization has identified over the short, medium, and long term,” their impact “on the organization’s businesses, strategy, and financial planning,” and “the resilience of the organization’s strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.”¹¹² As to risk management, disclosure includes describing “the organization’s processes for identifying and assessing climate-related risks” and “for managing climate-related risks,” and how those processes “are integrated into the organization’s overall risk management.”¹¹³ Finally, under metrics and targets, corporations should disclose “the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process,” and the “Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.”¹¹⁴ Corporations should also describe “the targets used by the organization to manage climate-related risks and opportunities and performance against targets.”¹¹⁵

109. *Id.* at iii.

110. *Id.* at 14.

111. *Id.*

112. *Id.*

113. *Id.*

114. *Id.* Scope 1 emissions are direct emissions from sources owned or controlled by the corporation (e.g., emissions from on-site fossil fuel combustion). Scope 2 emissions are indirect emissions from sources controlled by the corporation (e.g., emissions resulting from the purchase of electricity). Scope 3 emissions are from sources not owned or directly controlled by the corporation, but related to the corporation’s activities (e.g., emissions resulting from employee commuting). *Cf.* EPA, *Greenhouse Gases at EPA* [<https://perma.cc/B4B4-JJ3W>].

115. *Id.*

As a final layer, the TCFD framework provides guidance on how to go about making these recommended disclosures—that is, what kinds of information to provide in a disclosure. For example, under the first recommended disclosure for governance, “board oversight,” one suggested item includes the “processes and frequency by which the board and/or board committees . . . are informed about climate-related issues.”¹¹⁶ The TCFD report identifies seven principles that should guide corporate disclosures. Climate-related disclosures should be (1) relevant; (2) specific and complete; (3) clear, balanced, and understandable; (4) consistent over time; (5) comparable among companies within a sector, industry or portfolio; (6) reliable, verifiable, and objective; and (7) timely.¹¹⁷

The TCFD framework has garnered broad support from the investment community, regulators, and corporations.¹¹⁸ The TCFD’s 2020 Status Report found that 1,340 corporations globally have expressed support for its recommendations, including 219 U.S. companies.¹¹⁹ Financial institutions managing \$150 trillion have stated support for the TCFD,¹²⁰ including major investors like BlackRock, which alone manages over \$7 trillion in assets.¹²¹ Countries have increasingly announced their support for the framework, with some announcing intent to mandate disclosures that align with its recommendations, most recently New Zealand and the United Kingdom (“UK”).¹²² And in the European Union (“EU”), a recent public consultation survey on amending the Non-Financial Reporting Direc-

116. *Id.* at 19.

117. *Id.* at 18.

118. EDF and Policy Integrity, along with the Sabin Center for Climate Change Law at Columbia Law School, submitted joint comments to the New York Public Service Commission, which responds to the Commission’s query as to whether it should adopt the TCFD framework, including discussion of support for the TCFD and various other regimes. See Env’t Def. Fund, Inst. for Pol’y Integrity & The Sabin Ctr. for Climate Change L. at Colum. L. Sch., Joint Comments to the N.Y. Pub. Serv. Comm’n, Case No. 20-M-0499 – In the Matter Regarding the Need for Reporting Risks Related to Climate Change (Dec. 9, 2020) [hereinafter “Joint Comments to NYPSC”].

119. TASK FORCE ON CLIMATE-RELATED FIN. DISCLOSURES, 2020 STATUS REPORT 2, 68 (2020) [<https://perma.cc/55QE-4RFL>] [hereinafter “TCFD 2020 STATUS REPORT”].

120. *Id.* at 2.

121. Larry Fink, *A Fundamental Reshaping of Finance*, BLACKROCK (Jan. 14, 2020) [<https://perma.cc/RCG7-EC73>].

122. Mark Segal, *UK Becomes First Country in the World to Make TCFD-Aligned Disclosures Mandatory*, ESG TODAY (Nov. 9, 2020) [<https://perma.cc/2DU9-HT78>]; *Mandatory Climate-Related Financial Disclosure Proposed*, RADIO NEW ZEALAND (Sept. 15, 2020) [<https://perma.cc/W8Y8-G4WL>]; TCFD 2020 STATUS REPORT, *supra* note 119, at 3; CFTC REPORT, *supra* note 4, at 96 (also noting Canadian officials have recommended the adoption of the TCFD).

tive (“NFRD”) found that seventy-one percent of respondents agreed that any changes should incorporate the TCFD framework.¹²³

ii. *The SASB Standards*

As noted above, granular voluntary standards that encourage corporations to provide details compatible with the TCFD framework have also emerged.¹²⁴ While many of these organizations share similarities in their missions and principles, SASB’s work serves as a leading example of a set of standards that supplements the TCFD framework by providing detail and specificity. Over 450 companies have adopted SASB’s industry-specific standards, including 234 in the S&P Global 1200.¹²⁵ Major investors, including BlackRock and State Street Global Advisors, also rely on the standards.¹²⁶

The SASB standards provide accounting standards for climate-related disclosure. SASB itself is modeled upon the Financial Accounting Standards Board (“FASB”), a private organization that serves as the SEC’s designated accounting standard setter.¹²⁷ SASB

123. NFRD CONSULTATION SUMMARY, *supra* note 69, at 21 (588 responses were submitted by stakeholders across Europe and elsewhere, representing users and prepares, financial and non-financial corporations, academia and non-governmental organizations).

Although the TCFD framework has been rightfully heralded, critics have pointed to several weaknesses of the framework. Aside from the fact that the framework has not elicited sufficient disclosure, as discussed below, other criticism include that it provides too much flexibility to corporations over which scenarios to choose when conducting scenario analysis and insufficiently focuses on short-term risk disclosure. See POLICY INTEGRITY CONFERENCE BRIEF, *supra* note 87, at 8–9 (summarizing remarks of Margaret Peloso of Vinson & Elkins LLP).

124. Helle Bank Jorgensen, *Demystifying the “Alphabet Soup” of Reporting Frameworks*, REUTERS EVENTS (June 27, 2018), <https://www.reuters-events.com/sustainability/demystifying-alphabet-soup-reporting-frameworks> [https://perma.cc/TE4K-FDYT].

125. *Global Use of SASB Standards*, SUSTAINABILITY ACCT. STANDARDS BD., <https://www.sasb.org/about/global-use> [https://perma.cc/SH4W-F64G].

126. Fink, *supra* note 121; Letter from Cyrus Taraporevala, Pres. & Chief Exec. Officer, State Street Global Advisors, to Board Members (Jan. 28, 2020), <https://www.ssga.com/library-content/pdfs/insights/CEOs-letter-on-SSGA-2020-proxy-voting-agenda.pdf> [https://perma.cc/7K7W-SWFZ].

127. See Jebe, *supra* note 64, at 667–68. An accounting standard is a “standardized guiding principle that determines the policies and practices of financial accounting” and is intended to improve transparency and facilitate reporting. *What Is an Accounting Standard?*, CORP. FIN. INST., <https://corporatefinanceinstitute.com/resources/knowledge/accounting/accounting-standard/> [https://perma.cc/SHG3-2JAU]. FASB only sets standards; it does not enforce compliance with them or the content of disclosures.

Some have argued that FASB could be the appropriate authority for setting non-financial standards to complement its financial accounting standards. The organization has the infrastructure, institutional knowledge, and credibility with the investment and

aims to create FASB-like standards focused on sustainability for use in SEC filings like the 10-K annual report.¹²⁸ SASB standards hew closely to U.S. securities law by focusing on factors that are most likely to be deemed material under existing case law and SEC regulations.¹²⁹ SASB characterizes sustainability accounting as a complement to financial reporting that “provide[s] a more complete view of a corporation’s performance on material factors likely to affect its ability to create long-term value.”¹³⁰ SASB’s approach, therefore, “consists of defining operational metrics on material, industry-specific sustainability topics likely to affect current or future financial

corporate community to successfully create nonfinancial information accounting standards. While FASB has no plans to set sustainability standards, the governing organization for its international counterpart recently took steps toward doing so. The International Financial Reporting Standards Foundation, home to the International Accounting Standards Board (“IASB”), the organization that sets the financial reporting standards for most of the world, recently published a consultation paper setting out potential options for involvement in sustainability reporting. One of its options is to create a counterpart to the IASB in the form of a Sustainability Standards Board to develop global sustainability standards. RICHARD BARKER & ROBERT G. ECCLES, SHOULD FASB AND IASB BE RESPONSIBLE FOR SETTING STANDARDS FOR NONFINANCIAL INFORMATION? (2018), https://www.sbs.ox.ac.uk/sites/default/files/2018-10/Green%20Paper_0.pdf [<https://perma.cc/63WC-48G5>]; INT’L FIN. REPORTING STANDARDS FOUND., CONSULTATION PAPER ON SUSTAINABILITY REPORTING (2020), <https://cdn.ifrs.org/content/dam/ifrs/project/sustainability-reporting/consultation-paper-on-sustainability-reporting.pdf> [<https://perma.cc/XR2S-VTKL>].

128. BARKER & ECCLES, *supra* note 127, at 21.

129. *Id.* SASB’s focus on the impact of climate risk for *investors* can be contrasted with the GRI’s focus on the *broader society*. The GRI’s disclosure standards are more tailored to address how the corporation will affect the environment; SASB, vice versa. See Dunstan Allison-Hope, *Can the GRI and SASB Reporting Frameworks Be Collaborative?* GREENBIZ (Jan. 2, 2018), <https://www.greenbiz.com/article/can-gri-and-sasb-reporting-frameworks-be-collaborative> [<https://perma.cc/PW7S-CPHC>]. Notably, the TSC materiality standard is different than that in other countries, including those in the European Union, which has a double materiality standard for nonfinancial information—disclosure is required for information on how climate change impacts the company and how the company impacts climate change. 2017 EU Guidance, *supra* note 66, at 5; *Guidelines on Non-Financial Reporting: Supplement to Reporting Climate-Related Information*, 2019 O.J. (C 209), at 4–5 (June 6, 2019) [<https://perma.cc/7CC5-UKV8>]. The TCFD report acknowledges that some recommended disclosures may not be “clearly tied to an assessment of materiality” but that “[b]ecause climate-related risk is a non-diversifiable risk that affects nearly all sectors, many investors believe it requires special attention.” TCFD REPORT, *supra* note 9, at 34.

130. SASB CONCEPTUAL FRAMEWORK, *supra* note 66, at 4–5. “Sustainability accounting refers to the measurement, management, and reporting” of “corporate activities that maintain or enhance the ability of the company to create value over the long term.” *Id.* at 2, 4.

value.”¹³¹ A core objective is to provide decision-useful information for both the corporation and its investors.¹³²

The SASB standards are industry-specific, with quantitative metrics for seventy-seven different sectors.¹³³ SASB selects sustainability topics it deems material to the industry and provides accounting metrics—that is, the information that actually must be reported—for each topic.¹³⁴ Topics selected must (1) have the potential to affect corporate value; (2) be of interest to investors; (3) be relevant across an industry; (4) be actionable by (within the control of) companies; and (5) be reflective of stakeholder consensus.¹³⁵ The metrics chosen must meet explicit criteria, namely: fair representation, useful, applicable, comparable, complete, verifiable, aligned, neutral, and distributive.¹³⁶

SASB’s standards are also detailed. For example, its standards for the semiconductor industry include metrics such as “processor energy efficiency,” which is required to be disclosed in watts for servers, desktops, and laptops, and “total emissions from perfluorinated compounds.”¹³⁷ Notably, not all of SASB’s standards focus on climate-related information; it provides standards on five dimensions of sustainability: environment, social capital, human capital, business model and innovation, and leadership and governance.¹³⁸ SASB’s standards require many, if not all, industries to report on emissions and energy consumption, both of which are highly relevant to transition risks. Some metrics are also relevant to physical risk, such as the water management metrics, which include information on withdrawal and consumption generally and in areas designated high stress,¹³⁹ and the grid

131. *Id.* at 5.

132. *Id.* at 9.

133. *Standards Overview*, SUSTAINABILITY ACCT. STANDARDS BD., <https://www.sasb.org/standards/> [<https://perma.cc/4UD5-U8UX>].

134. *See* SASB CONCEPTUAL FRAMEWORK, *supra* note 66, at 10.

135. *Id.* at 18–19.

136. *Id.* at 19. SASB has recently proposed to amend its criteria by adding the characteristic “understandable” to this list, removing “useful” (as redundant because the core objective of the standards is to elicit useful information), and consolidating “applicable” and “distributive” under “aligned” and “comparable,” respectively. SUSTAINABILITY ACCT. STANDARDS BD., PROPOSED CHANGES TO THE SASB CONCEPTUAL FRAMEWORK & RULES OF PROCEDURE: BASES FOR CONCLUSIONS & INVITATION TO COMMENT ON EXPOSURE DRAFTS 8–9 (2020), <https://www.sasb.org/wp-content/uploads/2020/08/Invitation-to-Comment-SASB-CF-RoP.pdf> [<https://perma.cc/3THG-AA55>].

137. SUSTAINABILITY ACCT. STANDARDS BD., SEMICONDUCTORS: SUSTAINABILITY ACCOUNTING STANDARD 6 (2018), https://www.sasb.org/wp-content/uploads/2018/11/Semiconductors_Standard_2018.pdf [<https://perma.cc/7J7S-DXJE>] [hereinafter SASB SEMICONDUCTORS STANDARD].

138. SASB CONCEPTUAL FRAMEWORK, *supra* note 66, at 2–3.

139. *See, e.g.*, SASB Semiconductors Standard, *supra* note 137, at 11–14.

resilience metrics for electric utilities, which demand information on the number and causes of disruptions and on efforts to address future disruptions.¹⁴⁰

C. The Existing Regime Is Not Producing Sufficient Disclosure

While the SEC's 2010 Guidance and the rise of voluntary frameworks and standards have been important steps toward improved disclosure, neither has yielded comparable, specific, and decision-useful information on climate risk for investors. The SEC's 2010 Guidance represented a significant step: for the first time, a U.S. federal agency recognized that climate change creates financial risks that should be disclosed by corporations. In practice, however, the SEC's 2010 Guidance did not result in the disclosure many expected. In a report to Congress two years after its publication, the SEC concluded that it had not seen a noticeable change in disclosure from the year before the guidance came out to the year after.¹⁴¹ Outside studies conducted in the first few years after publication of the guidance reached similar conclusions.¹⁴² One examination of disclosures made for fiscal years 2010 to 2013, for example, found that disclosures "are very brief, provide little discussion of material issues, and do not quantify impacts or risk," and that forty-one percent of corporations did not include *any* climate-related disclosure in their annual report.¹⁴³ Even now, some corporations continue to avoid climate risk disclosures altogether.¹⁴⁴ Others provide only boilerplate disclosures that are neither corporation-specific (or even industry-specific) nor decision-useful—that is, they do not help investors understand and assess the risk the corporation faces or how that risk compares to those faced by other corporations.¹⁴⁵

140. SUSTAINABILITY ACCOUNTING STANDARDS BD., *ELECTRIC UTILITIES & POWER GENERATORS: SUSTAINABILITY ACCOUNTING STANDARD* 43–45 (2018).

141. U.S. GOV'T ACCOUNTABILITY OFF., GAO-18-188, *CLIMATE RELATED RISKS: SEC HAS TAKEN STEPS TO CLARIFY DISCLOSURE REQUIREMENTS* 15 (2018), <https://www.gao.gov/assets/gao-18-188.pdf> [<https://perma.cc/7TSW-T22B>].

142. JIM COBURN & JACKIE COOK, CERES, *COOL RESPONSE: THE SEC & CORPORATE CLIMATE CHANGE REPORTING, SEC CLIMATE GUIDANCE & S&P 500 REPORTING—2010 TO 2013* 5 (2014), https://www.ceres.org/sites/default/files/reports/2017-03/Ceres_SECguidance-append_020414_web.pdf [<https://perma.cc/4JE8-2DJP>].

143. *Id.*

144. *See generally* PARKER BOLSTAD, SADIE FRANK, ERIC GESICK, & DAVID VICTOR, BROOKINGS INST., *FLYING BLIND: WHAT DO INVESTORS REALLY KNOW ABOUT CLIMATE CHANGE RISKS IN THE U.S. EQUITY AND MUNICIPAL DEBT MARKETS?* 3–4 (2020), https://www.brookings.edu/wp-content/uploads/2020/09/WP67_Victor-et-al.pdf [<https://perma.cc/8LNV-BEGK>].

145. *Id.*

The outgrowth of voluntary frameworks and standards, although a critical development, has not resolved these core challenges. SASB conducted a State of Disclosure report in 2017 and found that “the most common form of disclosure across the majority of industries and topics was generic boilerplate language, which is inadequate for investment decision-making.”¹⁴⁶ Boilerplate disclosure is not tailored to “reflect the company’s specific and unique circumstances,” and thus fails to provide its audience with “sufficient and significant information to differentiate between the company and most, if not all, of its peers.”¹⁴⁷ For example, the insurance company Prudential acknowledged the reality of climate risk in its Form 10-K, but merely stated that “climate change may increase the frequency and severity of weather related disasters and pandemics,” and that their operations may be threatened by the “occurrence of natural disasters, including hurricanes, floods, earthquakes, tsunamis, [and] tornadoes.”¹⁴⁸ The SASB report found that overall, “companies continue to take a minimally compliant approach to sustainability disclosure, providing the market with information that is inadequate for efficient pricing and effective decision making.”¹⁴⁹

More recent reports have reached similar conclusions. One 2020 study, for example, found that while disclosure may have increased in quantity, “[m]ore firms are disclosing more general information that is essentially of no utility to the marketplace.”¹⁵⁰ Although the data show that more corporations are saying more,¹⁵¹ much of the disclosure involves only transition risk, most of it does not quantify risk, and much of the information disclosed is unsurprising.¹⁵² Exxon Mobil’s 2019 annual report is a touchstone example, explaining that “a number of countries have adopted, or are considering the adoption of, regulatory frameworks to reduce greenhouse gas emissions” and that such policies could “make our products more expensive, less competitive, lengthen project implementation times, and reduce demand for hydrocarbons, as well as shift hydrocarbon demand toward relatively lower carbon sources such as natural gas.”¹⁵³ The report further notes that

146. SASB STATE OF DISCLOSURE, *supra* note 7069, at 2.

147. *Id.* at 7. More generally, boilerplate disclosure involves “standardized, recyclable language,” and results in corporations providing “essentially identical disclosures.” Jeremy McClane, *Boilerplate and the Impact of Disclosure in Securities Dealmaking*, 72 VAND. L. REV. 194–95 (2019).

148. SASB STATE OF DISCLOSURE, *supra* note 70, at 39.

149. *Id.* at 3.

150. BOLSTAD ET AL., *supra* note 144, at 3.

151. *Id.* at 6-7; TCFD 2020 STATUS REPORT, *supra* note 119, at 12.

152. BOLSTAD ET AL., *supra* note 144, at 10–11.

153. EXXON MOBIL CORP., Annual Report (Form 10-K) 3 (Feb. 26, 2020).

“current and pending greenhouse gas regulations or policies may also increase our compliance costs, such as for monitoring or sequestering emissions.”¹⁵⁴ These general statements could apply to any energy company and are thus useless for investors seeking to make cross-company comparisons of climate risk. The disclosure contains, for example, no analysis of which of Exxon’s planned capital expenditures are for projects that would be unprofitable in a future that meets the goals of the Paris Agreement (<2°C warming), or under other policy scenarios.¹⁵⁵

Disclosure can be lacking even where corporations have committed to, and are ostensibly seeking to align reporting with, the TCFD framework and/or SASB standards. In its 2020 Status Report, the TCFD found that only seventeen percent of companies discussed their process for integrating climate change into risk management, and only seven percent discussed resilience of strategy, two key recommended disclosures.¹⁵⁶ The recommendation most reported was disclosure of risks and opportunities identified, yet only forty-one percent of companies made that disclosure.¹⁵⁷ And, while hundreds of corporations have signed on to the TCFD framework, less than eight percent comply with the recommendation to provide climate risk information in their annual report.¹⁵⁸

IV.

CURRENT IMPEDIMENTS TO IMPROVED DISCLOSURE

Dissatisfied with the nonexistent or perfunctory disclosures described above, investors have become increasingly aggressive in demanding more information on climate risk from corporations in which they hold shares. At the time of this writing, 545 investors, collectively managing more than \$52 trillion in assets, have signed the Climate Action 100+ Statement, committing to advocate for improved climate risk disclosures in line with the TCFD recommendations by

154. *Id.*

155. *Cf.* CARBON TRACKER INITIATIVE, EXXONMOBIL COMPANY ENGAGEMENT PROFILE 5 (2019), https://carbontracker.org/wp-content/uploads/2020/07/CTI_CA100_OG_2019_Exxon.pdf (calculating that at least 55% of Exxon’s planned capital expenditures are inconsistent with a policy pathway that limits warming to 1.7-1.8°C).

156. TCFD 2020 STATUS REPORT, *supra* note 119, at 11.

157. *Id.*

158. *Id.* at 11–12. SASB also found that less than 8% of reporting companies provided the information in an annual report. *Global Use of SASB Standards*, SUSTAINABILITY ACCT. STANDARDS BD., <https://www.sasb.org/about/global-use> [<https://perma.cc/SH4W-F64G>].

investee companies.¹⁵⁹ Signatories include two of the largest fund managers in the world, BlackRock and State Street Global Advisors. Major investors are also using the climate risk information they do have to make prudent investment decisions.¹⁶⁰

One might think that these investor calls alone would be sufficient to prompt improved disclosure, but for a number of reasons, managers might be unresponsive to shareholder demands in the absence of a legal mandate to satisfy them. These include market-related explanations surrounding information and incentive mismatches among corporations and managers, and the SEC's past disinterest in and non-enforcement of climate risk disclosure.

A. *Markets' Failure to Drive Disclosure*

In an "ideal" market—where a corporation and its managers' incentives are fully aligned, and managers make informed, rational decisions with the goal of maximizing the corporation's long-term value—corporations would already be addressing climate risk and disclosing this information to their investors. However, in reality, persistent in-

159. *Investors*, CLIMATE ACTION 100+, <https://www.climateaction100.org/investors/> [<https://perma.cc/3ZXX-AQVJ>].

Additionally, a growing number of shareholder proposals are calling for increased climate consideration, assessment, disclosure, and management. During the 2020 proxy season, at least 140 climate-related shareholder proposals were filed at U.S. companies. Rob Berridge, *How Climate Proposals Fared During the 2020 Proxy Season*, CERES (Sept. 14, 2020), <https://www.ceres.org/news-center/blog/how-climate-proposals-fared-during-2020-proxy-season> [<https://perma.cc/MT3N-M7E3>]. While many of these proposals failed to garner a majority vote, the proposals averaged over 30% approval, an increase over previous years, and 40% were withdrawn in return for commitments by the corporation. *Id.* Notable winning proposals included a Phillips 66 shareholder proposals on petrochemical climate risk and a Chevron shareholder proposal demanding greater disclosure on whether the corporation's lobbying activities align with goals to limit global warming. Press Release, As You Sow, Majority Vote – Phillips 66 Shareholders Strongly Back Petrochemical Climate-Risk Resolution (May 8, 2020), <https://www.asyousow.org/press-releases/2020/5/8/phillips-66-shareholder-proposal-climate-change> [<https://perma.cc/W4JD-ZJB7>]; CHEVRON, 2020 PROXY STATEMENT 78 (May 31, 2020), <https://www.chevron.com/-/media/shared-media/documents/chevron-proxy-statement-2020.pdf> [<https://perma.cc/Z288-YEJL>].

160. In January 2020, BlackRock, the world's largest asset manager, announced its intent to exit investments from companies that generate more than 25% of their revenues from thermal coal production. Fink, *supra* note 121. In September, Morgan Stanley announced that it plans to move all of its loans and investments out of fossil fuels in the next thirty years. Press Release, Morgan Stanley, Morgan Stanley Announces Commitment to Reach Net Zero Financed Emissions by 2050 (Sept. 21, 2020), <https://www.morganstanley.com/press-releases/morgan-stanley-announces-commitment-to-reach-net-zero-financed-e> [<https://perma.cc/ZMP3-9B9E>]. Investors are finding new ways to integrate climate information, including acquiring climate data and risk analysis companies. See Vizcarra, *supra* note 84, at 10109–10.

formation failures, conflicting managerial incentives, and biased decision-making heuristics have led to the widespread problem of insufficient climate risk disclosure.

Information asymmetry between climate scientists and corporate managers represents a primary hurdle to effective disclosure of climate risk.¹⁶¹ While managers may have the asset-level data that is necessary for a proper valuation of climate risk, they usually do not have the most up-to-date information on how climate change is expected to affect different geographic regions. Climate experts advising investors have the opposite problem, as they lack the firm-specific information that is necessary to assess climate risk on a firm-by-firm basis.

This information asymmetry persists when managers decline to disclose asset-level information to investors, which can occur when managements' incentives are not aligned with the long-term interests of the corporation. Although climate risk is likely to affect companies in the short-term, some of the most severe effects of climate change will occur on a time horizon that is longer than the business cycles that officers are traditionally accustomed to planning for.¹⁶² Also, because executive compensation structures often reward short-term improvements in shareholder value over long-term performance,¹⁶³ managers may have implicit incentives to overlook information that would lead to drops in stock prices.¹⁶⁴ Managers who take steps to improve a corporation's long-term value by sacrificing short-term profits could also be at risk of being ousted by dissatisfied short-term shareholders, which may disincentivize a corporation's officers from pursuing climate risk mitigation strategies altogether.¹⁶⁵ A 2005 survey of corpo-

161. See Madison Condon, *Market Myopia's Climate Bubble*, 2022 UTAH L. REV. 63, 67–68, 122 (2021).

162. Mark Carney, Governor, Bank of England, Speech at the European Commission Conference: A New Horizon (Mar. 21, 2019), <https://www.bankofengland.co.uk/-/media/boe/files/speech/2019/a-new-horizon-speech-by-mark-carney.pdf> [https://perma.cc/QN5R-TNY2] (“Climate risks also have a number of distinctive elements, which, in combination, require a strategic approach. These include their . . . [u]ncertain time horizon which may stretch beyond traditional business planning cycles.”).

163. LUCIAN BEBCHUCK & JESSE FRIED, *PAY WITHOUT PERFORMANCE: THE UNFULFILLED PROMISE OF EXECUTIVE COMPENSATION* (2004); Marcel Kahan & Edward B. Rock, *Hedge Funds in Corporate Governance and Corporate Control*, 155 U. PA. L. REV. 1021, 1088 (2007).

164. Condon, *supra* note 161, at 84.

165. Despite the increasing prevalence of index funds and exchange traded funds, which have incentives to promote long-term value, these diversified investors are usually less likely to play an active role in governing individual companies than short-term investors. See Ronald J. Gilson & Jeffrey N. Gordon, *The Agency Costs of*

rate executives found that eighty percent “felt pressure to decrease spending in areas like research and development in order to meet quarterly earnings targets.”¹⁶⁶ Investments in climate risk management may be comparable to research and development investments in their long-term benefits and short-term costs, and may be deprioritized in a similar manner.

In addition to the problem of information failure, cognitive biases may prevent corporate officers and directors from acknowledging the severity and seriousness of climate risk to their corporation’s health and profitability.¹⁶⁷ Behavioral economists have identified several cognitive biases and common decision-making patterns that might result in a systemic undervaluing of climate risk. The *availability heuristic* predicts that individuals will prioritize risks that can be recalled and irrationally discount low probability “black swan” events if they have not occurred in the past.¹⁶⁸ Even if general climate risk is known, *optimism bias* predicts that individuals will often assume that they, themselves, are less likely to experience the most negative consequences of an event. As a result, managers may focus their time and attention on best-case scenarios and underprepare for the worst climate scenarios.¹⁶⁹ Lastly, *prospect theory* suggests that individuals put more weight on outcomes that are certain and less weight on outcomes that are uncertain, discounting them by more than the rational weighting of their probability of occurrence.¹⁷⁰ Therefore, “managers may overweight the costs of adaptation measures in the present, which have a certain, known, price tag, and underweight expected future climate damages whose magnitude and timing is more uncertain.”¹⁷¹

These information failures and heuristics can explain how corporations continue to provide insufficient climate risk information despite rising investor pressure. They also suggest that insufficient reporting can be overcome through improved mandatory disclosure rules. Such disclosure could at least partially correct information

Agency Capitalism: Activist Investors and the Revaluation of Governance Rights, 113 COLUM. L. REV. 863, 889–90 (2013).

166. Condon, *supra* note 161, at 85 n.123 (citing John R. Graham, Campbell Harvey & Shiva Rajgopal, *The Economic Implications of Corporate Financial Reporting*, 40 J. ACCT. & ECON. 3, 32–35 (2005)).

167. *Id.* at 99–102.

168. *Id.* at 99.

169. *Id.* at 101 (citing Donald Langevoort, *Organized Illusions: A Behavioral Theory of Why Corporations Mislead Stock Market Investors (and Cause Other Social Harms)*, 146 U. PENN. L. REV. 101, 144 (1997)).

170. *Id.* (citing Daniel Kahneman & Amos Tversky, *Prospect Theory: An Analysis of Decision Under Risk*, 47 ECONOMETRICA 263 (1979)).

171. *Id.*

asymmetries between corporate managers and climate experts and between managers and investors. It could also counteract cognitive biases that prevent officers and directors from confronting their companies' climate risks.

B. SEC Non-Enforcement

Until recently, the SEC had done little to prompt corporations to improve their climate risk disclosure. Trump-appointed SEC Commissioner Hester Peirce has publicly characterized organizations' calls for improved disclosure as a coordinated attempt at "public shaming," and a "brutish" effort by a "group of people who take the lead in instigating their fellow citizens into a frenzy of moral rectitude."¹⁷² Former SEC Chairman Jay Clayton acknowledged the reality of climate risk, but opposed petitions for rulemaking that would standardize ESG disclosure, arguing that the flexibility of the existing materiality standard is preferable.¹⁷³ Even prior to Clayton's tenure, the Commission did not aggressively promote disclosure in accordance with the 2010 Guidance. In 2010, the SEC's Division of Corporate Finance sent forty-nine "comment letters to companies regarding the quality of their climate risk disclosure," but only three were sent in 2012 and none were sent in 2013.¹⁷⁴ From 2016 to 2020, a total of just six letters were issued.¹⁷⁵

In addition to failing to push for improved climate disclosures itself, the Commission hindered investors' attempts to do so on their own, actively intervening to block investor proposals related to climate change, including climate disclosure proposals, from being voted

172. Hester M. Peirce, Comm'r, Sec. & Exch. Comm'n, *Scarlet Letters: Remarks Before the American Enterprise Institute* (June 18, 2019).

173. Donna Mussio, Mary Beth Houlihan & Taylor Souter, *To Lead or Not to Lead: Contrasting Recent Statements by SEC and ESMA Chairs on ESG Disclosure*, HARV. L. SCH. F. ON CORP. GOV. (Mar. 16, 2020), <https://corpgov.law.harvard.edu/2020/03/16/to-lead-or-not-to-lead-contrasting-recent-statements-by-sec-and-esma-chairs-on-esg-disclosure/>.

174. CERES, *supra* note 20, at 31. Comment letters are used by the SEC staff to promote compliance where "the staff believes a company can significantly enhance its compliance with the applicable requirements." SEC. & EXCH. COMM'N, FILING REVIEW PROCESS, <https://www.sec.gov/divisions/corpfin/cffilingreview.htm>. These letters might "request that a company provide supplemental information to help the staff better understand the company's disclosure, revise disclosure in a document on file with the SEC, provide additional disclosure in a document on file with the SEC, or provide additional or different disclosure in a future filing with the SEC." *Id.*

175. CERES, *supra* note 20, at 31.

on in the proxy process.¹⁷⁶ As a result, corporate managers had little incentive to improve their disclosures.¹⁷⁷

Under the Biden Administration, however, the SEC has signaled interest in both more vigorously enforcing disclosure under the 2010 Guidance and promulgating new mandatory disclosure regulations aimed specifically at climate risk. After Commissioner Clayton's resignation in December 2020, President Biden nominated Gary Gensler, a supporter of improved climate risk disclosures, to chair the SEC.¹⁷⁸ Prior to Gensler's confirmation, Commissioner Allison Herren Lee, as Acting Chair, had already announced new measures to enforce the 2010 Guidance on climate risk.¹⁷⁹ With a majority of Commissioners

176. Madison Condon, *Climate Change's New Ally: Big Finance*, BOSTON REV. (July 28, 2020), <http://bostonreview.net/science-nature/madison-condon-climate-change%E2%80%99s-new-ally-big-finance> (citing David Hasemyer, *Investors Worried About Climate Change Run into New SEC Roadblocks*, INSIDE CLIMATE NEWS (May 3, 2019)) [<https://perma.cc/K9VL-D3PM>]; see also *Complaint* at 9–10, *Sierra Club v. U.S. Sec. & Exch. Comm'n*, No. 4:19-cv-06971 (N.D. Cal. Oct. 24, 2019) (seeking documents from SEC on increased use of no-action letters for climate-related proposals). The SEC does this through “no-action” letters, which are issued in response to requests for advice on whether an individual or entity's activities would constitute a violation of federal securities law and conclude that the SEC would not bring an enforcement action against the entity for its conduct. SECURITIES & EXCHANGE COMM'N, *No Action Letters* (Jan. 8, 2021) <https://www.sec.gov/regulation/staff-interpretations/no-action-letters>. Such letters may be sought when a company wants to exclude a shareholder proposal from being voted on in the proxy process. See, e.g., *Shareholder Proposal No-Action Responses Issued Under Exchange Act Rule 14a-8*, U.S. SEC. & EXCH. COMM'N (Dec. 23, 2020), <https://www.sec.gov/corpfin/shareholder-proposals-no-action> [<https://perma.cc/4D2V-9UGP>]. In 2017, the SEC issued guidance broadening its definition of “micromanagement,” a basis that can be used to exclude shareholder proposals. See *Staff Legal Bulletin No. 14I*, U.S. SEC. & EXCH. COMM'N (Nov. 1, 2017), <https://www.sec.gov/interps/legal/cfs1b14i.htm> [<https://perma.cc/US4Z-76NU>]. The SEC subsequently granted its first no-action letter allowing a corporation to exclude a proposal seeking adoption of an emissions targets. See Amy Harder, *Investors Stunned Over Oil Producer's Climate-Change Exemption*, AXIOS (Apr. 2, 2018), <https://www.axios.com/oil-producers-climate-change-exemption-e3887656-42c0-4510-ad0d-6118cc3aef94.html>.

177. Although the SEC is an independent agency, the Biden Administration's clear focus on climate risk is relevant. President Biden's campaign climate plan endorsed “requiring public companies to disclose climate risk and the greenhouse gas emissions in their operations and supply chains,” *The Biden Plan for a Clean Energy Revolution and Environmental Justice*, BIDEN HARRIS, <https://joebiden.com/climate-plan/> (last visited Feb. 1, 2021), and, in a January executive order, he called on the federal government to “drive assessment, disclosure, and mitigation of climate pollution and climate-related risks.” Exec. Order No. 14,008, 86 Fed. Reg. 7622, § 201 (Jan. 27, 2021). Additionally, Acting SEC Chair Lee and Commissioner Crenshaw have expressed strong support for climate-related disclosures, see *infra* note 182.

178. Katanga Johnson & Pete Schroeder, *U.S. SEC Chair Tells Congress He Plans New Rules on Climate Risk, Trading*, REUTERS (May 7, 2021).

179. Allison Herren Lee, Cmm'n'r, Sec. and Exch. Comm'n, Statement on the Review of Climate-Related Disclosure (Feb. 24, 2021), <https://perma.cc/NT2Q-EH4L>.

now in favor of stronger disclosures, it is widely expected that the SEC will announce new climate risk regulations in the early half of 2022.¹⁸⁰

V.

THE BENEFITS OF IMPROVED DISCLOSURE FOR CORPORATIONS, INVESTORS, MARKETS, AND SOCIETY

The prior Section provided several explanations for why climate risk disclosure has not improved to a point where corporations are providing comparable, specific, and decision-useful information. Given these impediments to disclosure, some investors and regulators have called for new rules that will *require* improved disclosure. As of the time of this writing, 631 investors representing over \$37 trillion in assets had signed onto the Global Investor Statement to Governments on Climate Change, calling for “reliable and decision-useful climate-related financial information to price climate-related risks and opportunities effectively” and asking global leaders to “implement the TCFD recommendations into their jurisdictions, no later than 2020.”¹⁸¹ Regulators at the SEC¹⁸² and other U.S. federal agencies¹⁸³ have increasingly become cognizant of growing climate risk and the

180. See, e.g., Veronica E. Callahan, Ellen Kaye Fleishhacker, David F. Freeman, Jr., Brian D. Israel, Teresa L. Johnson, Michael D. Trager, Mark Epley, Daniel M. Hawke, James Feeney, Sarah Grey, Amber A. Hay, Marne Marotta, Joshua R. Martin, Stephanna F. Sztokowski, Erik Walsh & Charles Yi, *A Rising Tide of Climate-Related Disclosure Requirements? (ESG Advisory Series, Part 2)*, ARNOLD & PORTER (Mar. 9, 2021), <https://perma.cc/B7NS-U27X>.

181. Global Investor Statement to Governments on Climate Change (Dec. 19, 2019), <https://perma.cc/8ZCP-C396>. BlackRock has also joined calls for mandatory disclosure rules. See Simon Jessopp & Matthew Green, *BlackRock CEO Backs Mandatory Climate Reporting, Urges U.S. Action*, REUTERS (Nov. 10, 2020), <https://perma.cc/YDU4-S6J6>; see also Larry Fink, *Larry Fink's 2021 Letter to CEOs*, BLACKROCK (Jan. 26, 2021), <https://perma.cc/F2HF-VZ7A> (expressing strong support for a single reporting standard, “which will enable investors to make more informed decisions about how to achieve durable long-term returns”).

182. Acting Chair Lee and her Democratic colleagues have consistently criticized many of the SEC’s recent regulatory actions, including amending Regulation S-K, for failing to address climate risk in the process or undermining ESG disclosure more broadly. See, e.g., Allison Herren Lee & Caroline A. Crenshaw, Comm’rs, Securities & Exchange Comm’n, Joint Statement on Amendments to Regulations S-K: Management’s Discussion and Analysis, Selected Financial Data, and Supplementary Financial Information (Nov. 18, 2020), <https://perma.cc/Y5N9-SS9C>; Robert J. Jackson & Allison Herren Lee, Comm’rs, Securities & Exchange Comm’n, Joint Statement of Commissioners Robert J. Jackson, Jr. and Allison Herren Lee on Proposed Changes to Regulation S-K (Aug. 27, 2019), <https://perma.cc/AX46-ZXFN>. She has also argued that climate risk information has become as relevant to investor decision-making as traditional metrics, such as return on equity, or earnings volatility. Allison Herren Lee,

need for improved disclosures. International regulators too have taken major steps to mandate climate risk disclosure.¹⁸⁴

Improving mandatory disclosure rules so that they elicit comparable, specific, and decision-useful climate risk information would provide benefits to companies, investors, and the broader economy. As the previous sections demonstrated, neither existing SEC requirements nor voluntary disclosure programs provide stakeholders with the information necessary to properly price risk and make investment decisions. Like risk disclosure generally, climate risk disclosure is essential for price discovery and market functioning, resulting in smarter investing and allocation of capital to higher-value projects or corporations. The increased transparency enabled through improved disclosure can also correct mispricing, resulting in informed risk management strategies that would stabilize investor portfolios and mitigate risks of a “climate bubble” akin to the housing bubble of the late 2000s.¹⁸⁵ Bringing the quality of climate risk disclosure level with

Big Business’s Undisclosed Climate Crisis Plans, N.Y. TIMES (Sept. 27, 2020), <https://perma.cc/FTS3-EDUR>.

In 2020, the SEC’s Investor Advisory Committee made a formal recommendation that the SEC find that ESG information is material and take action to incorporate ESG disclosures into the disclosure regime. SECURITIES & EXCHANGE COMM’N INVESTOR ADVISORY COMM., RECOMMENDATIONS OF THE SEC INVESTOR ADVISORY COMMITTEE RELATING TO ESG DISCLOSURE (May 21, 2020), <https://perma.cc/8HRK-DJXM>.

183. See, e.g., CFTC REPORT, *supra* note 4, at i, 99–101; BD. OF GOVS. OF THE FED. RESERVE SYS., FINANCIAL STABILITY REPORT 58–59 (2020), <https://perma.cc/95HG-2NXS>; BD. OF GOVS. OF THE FED. RESERVE SYS., SUPERVISION AND REGULATION REPORT 26 (2020), <https://perma.cc/8SV5-5K2E> (recognizing climate risk in the context of microprudential risk).

Indeed, the Federal Reserve’s joining the Network for Greening of the Financial System, and the creation of a new Supervision Climate Committee signal a significant shift in the U.S. central bank’s public messaging on how it views climate-related risks. Press Release, Bd. of Govs. of the Fed. Reserve Sys., Federal Reserve Board Announces It Has Formally Joined the Network of Central Banks and Supervisors for Greening the Financial System, or NGFS, as a Member (Dec. 15, 2020), <https://perma.cc/LBT5-3HYR>; Press Release, Fed. Reserve Bank of N.Y., Kevin Stiroh to Step Down as Head of New York Fed Supervision to Assume New System Leadership Role at Board of Governors on Climate (Jan. 25, 2021), <https://perma.cc/6NP5-7URN>.

184. See *supra* note 122 and accompanying text. The EU is currently working on amending or replacing its non-financial disclosure regime, with the European Supervisory Authorities making clear that they favor mandatory, standardized reporting requirements. Letter from European Banking Auth., European Insurance & Occupational Pension Auth. & European Securities & Markets Auth., to Valdis Dombrovskis, Vice President, European Comm’n (June 11, 2020), <https://perma.cc/YX2R-QAJC>.

185. A “climate bubble” is a hypothesized scenario in which companies facing substantial climate risks are currently overvalued because markets are not properly considering either the physical impacts or the transition costs associated with climate

the quality of other forms of risk disclosure thus addresses financial risk relevant to the SEC's core mission and mandate.

A. *Benefits for Corporations*

Section IV showed that managers and directors of companies will often make decisions based on incomplete information and imperfect heuristics about the risks that they face. Other structural issues may additionally obstruct full and accurate accounting of risk. Managers and directors may have, for example, short-term incentives to boost quarterly earnings and share prices. Taken together, cognitive biases and mismatched incentives can result in managers underestimating or failing to foresee the risks that climate change poses for the long-term fiscal well-being of their companies. This lack of foresight will leave corporations unprepared to adapt to the rapidly changing climate and the regulatory environment that comes with it.

An improved mandatory disclosure regime that requires corporations to share their climate risk assessments and plans may thus help not only investors deciding how to allocate capital across corporations but also the corporations themselves. Improved mandatory disclosures could force corporations to engage in careful and systematic analyses of their exposures to climate risk, preventing them from ignoring worst-case scenarios or unfavorable information. Improved disclosure conveys other benefits as well, including improved information sharing, which may help companies in different industries and geographic regions develop better strategies for climate risk management—and enterprise risk management generally—as well as more strategic investment and business model decisions.

The CFTC Report came to a similar conclusion, finding that the benefits of improved disclosure for companies are three-fold: “the improved ability: (i) to identify, assess, manage, and adapt to the effects of climate change on operations, supply chains and customer demand;

change. Financial experts have raised concerns that economic shocks resulting from the sudden and rapid deflation of that bubble could trigger a new financial crisis. Condon, *supra* note 161, at 111–13. A related concept is the “carbon bubble,” in which fossil fuel assets are overvalued because in the medium- and long-term the world will be drastically reducing emissions and leaving reserves of fossil fuels unused. See Jean-Francois Mercure et al., *Macroeconomic Impact of Stranded Fossil Fuel Assets*, 8 NATURE CLIMATE CHANGE 588 (2018), <https://perma.cc/7YWU-9ZG3>; see also John R. Nolan, *Land Use and Climate Change Bubbles: Resilience, Retreat, and Due Diligence*, 39 WILLIAM & MARY ENV'T L. & POL'Y REV. 321 (2015) (describing the consequences of a coastal real estate bubble, in which flood-vulnerable properties see a sudden depression of value due to rising insurance costs or stricter building codes).

(ii) to relay risk and opportunity information to capital providers, investors, derivatives customers and counterparties, markets, and regulators; and, (iii) to learn from competitors about climate-related strategy and risk management best practices.”¹⁸⁶ Comprehensive and comparable disclosure is therefore needed “to inform [corporations’] strategic responses to climate risk by benchmarking their performance against peer organizations.”¹⁸⁷

Improved mandatory disclosure likely will also address a collective action problem that exists among corporations competing for investors. Currently, managers face strong short-term incentives to keep share prices and credit ratings high, and as a result, have little reason to disclose unfavorable climate risk information if it will lead investors to favor competing corporations.¹⁸⁸ However, because there are benefits to sharing information and strategies for addressing climate risk,¹⁸⁹ corporations would be better off in a world where they assess risks accurately and disclose this information so as long as they have assurance that other corporations will do the same.¹⁹⁰ An improved mandatory disclosure regime solves this problem by creating a level playing field. Corporate managers can benefit from information sharing, while avoiding the penalties and backlash that may have come with unilateral disclosure.¹⁹¹

B. *Benefits for Investors*

The efficient capital markets hypothesis predicts that rational investors who are aware of systemic errors in asset pricing will be able to engage in arbitrage—exploiting mispricing, reaping a profit, and bringing the value of the asset back in line with its fundamentals. But “investors can only price the risks that they are aware of,”¹⁹² and assessing the magnitude of an individual corporation’s climate risk “re-

186. CFTC REPORT, *supra* note 4, at 87.

187. *Id.* at 91.

188. *See supra* Section IV.A. This is especially the case in a regulatory environment where enforcement is unlikely.

189. CFTC REPORT, *supra* note 4.

190. Regulation is often used to address gamesmanship and to create a level playing field wherein all regulated entities are assured that their competitors will be required to comply with the same expectations. *See* CASS SUNSTEIN, AFTER THE RIGHTS REVOLUTION: RECONCEIVING THE REGULATORY STATE 49–51 (1990).

191. Notably, however, the TCFD has noted that a 2019 survey found that a majority of corporations believe there will be a first mover advantage to early disclosure in line with its recommendations. TASK FORCE ON CLIMATE-RELATED FIN. DISCLOSURES, SOUTH POLE, DISCLOSING CLIMATE-RELATED FINANCIAL RISKS AND OPPORTUNITIES: ARE BUSINESSES READY FOR TCFD 4 (2019), <https://perma.cc/6SMB-YEF5>.

192. Condon, *supra* note 161, at 1.

quires more granular data than is currently disclosed in financial reporting.”¹⁹³ As a result, ninety-three percent of institutional investors “view climate change as an investment risk that has yet to be priced in by all the key financial markets globally.”¹⁹⁴

Economic research bears out this widely held belief. In April 2020, the International Monetary Fund assessed the response of equity markets to past extreme weather events and concluded that “climate change physical risk does not appear to be reflected in global equity valuations.”¹⁹⁵ Other reports have similarly concluded that “investors do not fully anticipate the economic repercussions of heat as a first-order physical climate risk.”¹⁹⁶ According to one study, a corporation’s exposure to rising temperatures and extreme heat waves reduced its revenues, and greater heat exposure resulted in a greater deviation between analysts’ estimates and the corporation’s actual financial performance.¹⁹⁷

Asset-specific studies also offer a more detailed picture of climate risk mispricing across different markets. In 2019, BlackRock and Rhodium Group conducted an analysis of three asset types that face substantial physical risks from climate change: municipal bonds, commercial real estate, and electric utility equities. In the municipal bond market, researchers discovered that “similar bonds located in climate-sensitive and non-climate-sensitive areas . . . do not reveal significant differences in valuation.”¹⁹⁸ For commercial real estate, researchers found that “FEMA flood maps understate true risks.”¹⁹⁹ And for electric utilities, researchers compiled geospatial data on the location of every electrical power plant in the United States and used historical data and modeling to assess the susceptibility of each of these plants

193. *Id.* at 13.

194. BLOOMBERG, *supra* note 2.

195. INT’L MONETARY FUND, GLOBAL FINANCIAL STABILITY REPORT: MARKETS IN THE TIME OF COVID-19, at 85 (2020), <https://perma.cc/F6YN-M2RX>.

196. NORA M. C. PANKRATZ, ROB BAUER & JEROEN DERALL, CLIMATE CHANGE FIRM PERFORMANCE, AND INVESTOR SURPRISES 1 (Aug. 30, 2019), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3443146; *cf.* Tord Kjellstrom et al., *Working on a Warmer Planet: The Impact of Heat Stress on Labour Productivity and Decent Work*, INTERNATIONAL LABOR ORGANIZATION 13 (2019), <https://perma.cc/7KGS-PEZA> (“Projections based on a global temperature rise of 1.5°C by the end of the twenty-first century . . . suggest that, in 2030, 2.2 percent of total working hours worldwide will be lost to high temperatures—a productivity loss equivalent to 80 million full-time jobs.”).

197. Pankratz et al., *supra* note 196.

198. BLACKROCK, *supra* note 9, at 11.

199. *Id.* at 3, 14; *see also* Jen Schwartz, *National Flood Insurance Is Underwater Because of Outdated Science*, SCI. AM. (Mar. 23, 2018), <https://perma.cc/T4A5-WDLG>.

to physical risks such as hurricanes, flooding, and droughts. Although some of the most climate-resilient utilities traded at a slightly higher value, the majority of climate risk was still not priced into the electricity market.²⁰⁰ Other research has found similar evidence of mispricing in the agricultural market. One study compared long-term drought forecasts across publicly traded food companies and found that the market had failed to efficiently incorporate drought impacts on profits into stock prices.²⁰¹ Another adopted a climate-risk-adjusted trading strategy for agricultural stocks based on the Actuaries Climate Index and found positive returns over a one-year holding period, again suggesting that the market was “inefficient toward climate change risks.”²⁰²

Improved reporting is also useful for diversified investors, who are generally less exposed to firm-specific risks. Due to the rise of modern portfolio theory, institutional investors with broadly diversified portfolios control a majority of the stock market.²⁰³ While their diversification protects them from idiosyncratic, firm-specific, risks, they remain exposed to unhedgeable systematic risks, including pervasive climate-related risks. And while most of these institutional investor assets are held passively and not actively traded, improved disclosure aids in shareholder governance and oversight of portfolio companies.²⁰⁴ Because institutional investors retain large holdings in many fossil-intensive corporations, they may use this oversight to mitigate systematic climate risks directly through pressing for emissions reductions.²⁰⁵

Lastly, mandatory climate risk disclosures would reduce the prevalence (and the perceived prevalence) of “greenwashing,” a phenomenon in which companies and investment funds overstate their sustainability credentials in an effort to attract environmentally conscious consumers and investors. Greenwashing is a clear problem for

200. BLACKROCK, *supra* note 9, at 18.

201. Harrison G. Hong, Frank Weikai Li & Jiangmin Xu, *Climate Risks and Market Efficiency*, 208 J. ECONOMETRICS 265-81 (2019).

202. RUIHONG JIANG & CHENGGUO WENG, CLIMATE CHANGE RISK AND AGRICULTURE-RELATED STOCKS (Jan. 9, 2020), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3506311.

203. Madison Condon, *Externalities and the Common Owner*, 95 WASH. L. REV. 1, 13-14 (2020); *see also* Ann M. Lipton, *Family Loyalty: Mutual Fund Voting and Fiduciary Obligation*, 19 TENN. J. BUS. L. 175 (2017).

204. Asset managers like BlackRock and pension funds like CalPERS have called for improved climate risk disclosures that would allow for informed shareholder voting and oversight. *See Sustainable Investments Program: Climate Change*, CalPERS (Dec. 31, 2019), <https://perma.cc/4L67-CNSH>; Fink, *supra* note 121.

205. Condon, *supra* note 203, at 72-80.

misled investors and consumers, but it also disadvantages firms and funds that have made actual commitments to environmental responsibility and climate risk mitigation. These firms face competition from greenwashed competitors—competitors that would attract less attention in a market with more rigorous disclosures. Moreover, *fears* of widespread greenwashing can be harmful for companies, as consumer distrust weakens the demand even for genuinely sustainable products and services.²⁰⁶ Improving the climate risk reporting system and standardizing it across industries will help ESG indexes monitor and differentiate companies (and, in turn, help regulators monitor the decisions of index providers); as a result, sustainability-minded investors will have better information about corporations' actual commitments to climate risk management.

C. Benefits for Markets

Disclosure is essential for allowing investors to make accurate valuations of corporations, which in turn supports efficient allocation of capital across industries and individual corporations. As the CFTC Report explained, with sufficient disclosure, “[i]nvestors can better assess a more refined measure of the long-term cost of capital, as well as risks to firms, margins, cash flow and valuations.”²⁰⁷ When companies properly disclose their risks, investors can reduce their own uncertainty and stabilize the economy by diversifying their portfolios.²⁰⁸

Without sufficient disclosure, widespread mispricing could lead the economy towards a “climate bubble.” The market may respond to mispricing with a slow adjustment as it gradually incorporates accurate information about climate risk, or it may correct prices suddenly, creating a significant shift in a short window of time. Financial experts have expressed serious concerns about this latter scenario, which creates a risk to the economic system itself. In 2016, Mark Carney, then-Governor of the Bank of England, warned that “sharp changes in valu-

206. Sustainability and management scholars have warned that “if greenwashing practices continue to go unchecked by regulation, it is possible that green consumers will become increasingly cynical about green claims, eroding the market for green products and services.” Magali A. Delmas & Vanessa Cuerel Burbano, *The Drivers of Greenwashing*, 54 CAL. REV. MGMT. 64, 72 (2011), <https://perma.cc/SKJ4-QXA4>. Additionally, “it is challenging for investors and funds following . . . environmental assessment strategies to correctly assess firms on these dimensions when there is a lack of verifiable information available to them. Just as rampant, unchecked greenwashing could erode the consumer market . . . it could also erode the capital market for socially responsible investing.” *Id.*

207. CFTC REPORT, *supra* note 4, at 87.

208. FRED WELLINGTON & AMANDADA SAUER, FRAMING CLIMATE RISK IN PORTFOLIO MANAGEMENT 3 (2005), <https://perma.cc/AG9G-KDG5>.

ations” of energy company equities could cause a chain reaction throughout the financial sector.²⁰⁹ And in 2019, CFTC Commissioner Rostin Behnam compared the financial risks of climate change to the 2008 financial crisis.²¹⁰

Some researchers have made attempts at modeling how the economy will react to a bubble bursting, with a 2019 study warning that global warming-induced reductions in labor productivity and capital availability could lead to widespread defaults and declarations of bankruptcy, destabilizing the global banking system and requiring new bailouts.²¹¹ According to these researchers, taking measures to rescue insolvent banks “will cause an additional fiscal burden of approximately five to fifteen percent of gross domestic product per year.”²¹² Based on this and other studies, the economic harms from climate change will not just accrue to carbon-intensive industries and their investors. Instead, sudden disruptions to asset prices could affect the health of the entire economy as the shocks reverberate across the market.

D. *Benefits for Society*

In addition to the risk faced by private corporations and investors, climate change also creates financial risk for the American public at large. As the CFTC Report notes, if action is not taken to mitigate climate change, its “impacts could impair the productive capacity of the economy and undermine its ability to generate employment, income, and opportunity.”²¹³ Improved disclosure can help prevent such results by allowing corporations and investors to identify and manage climate risk and facilitate the orderly transition to a low-carbon economy. Improved climate risk disclosure benefits society not just by decreasing the likelihood of systemic financial shock but also by furthering greenhouse gas mitigation efforts. Economic research indicates that climate-related disclosures have already resulted in reduced emissions: one study found that UK-incorporated firms reduced their

209. Mark Carney, Gov., Bank of England, Chair, Fin. Stability Bd., *Resolving the Climate Paradox*, Arthur Burns Memorial Lecture (Sept. 22, 2016), <https://perma.cc/6GPS-VWVU>.

210. Behnam, *supra* note 3.

211. Francisco Lamperti et al., *The Public Costs of Climate-Induced Financial Instability*, 9 *NATURE CLIMATE CHANGE* 829 (2019), <https://perma.cc/39AU-9LKF>.

212. *Id.* at 829; *see also* EUROPEAN SYSTEMIC RISK BOARD, *TOO LATE, TOO SUDDEN: TRANSITION TO A LOW-CARBON ECONOMY AND SYSTEMIC RISK* (2016), <https://perma.cc/E9S3-T9EF>.

213. CFTC REPORT, *supra* note 4, at 3.

emissions by an average of fourteen to eighteen percent after the government mandated that companies disclose their emissions in 2013.²¹⁴

Greenhouse gas mitigation, in turn, provides health and welfare benefits to society by, for example, reducing the severity of air pollution, the spread of infectious disease, the intensity of severe weather events, and risks to the global food supply.²¹⁵ Many climate damages—including direct physical effects like flooding and heat island effect, economic impacts from increased food and energy prices, and human health impacts from respiratory illness and other diseases—are disproportionately borne by low-income communities and communities of color.²¹⁶ By helping to reduce emissions, improved disclosure can thus help lessen the burden of climate change on the communities most vulnerable to its harms.²¹⁷

* * * * *

Given these benefits, a growing number of investors and regulators are calling for improved climate risk disclosures, which would provide substantial benefits for corporations, investors, markets, and society. But because neither existing legal requirements nor voluntary disclosure programs have succeeded in eliciting comparable, specific, and decision-useful disclosures, the SEC should promulgate new disclosure regulations focused on the climate risk.

214. Benedikt Downar et al., *The Impact of Carbon Disclosure Mandates on Emissions and Financial Operating Performance* (2020), <https://perma.cc/ET7A-52TV>.

215. Megan Ceronsky & Peter Heisler, *The Many Benefits of Reducing Carbon Pollution from Existing Power Plants*, ENV'TL DEF. FUND (May 15, 2014), <https://perma.cc/67CC-H9FW>.

216. ILIANA PAUL ET. AL., INST. FOR POL'Y INTEGRITY, IMPROVING ENVIRONMENTAL JUSTICE ANALYSIS: EXECUTIVE ORDER 12,898 AND CLIMATE CHANGE 6–7 (2021), <https://perma.cc/58A2-M477>; see also Brad Plumer & Nadja Popovich, *How Decades of Racist Housing Policy Left Neighborhoods Sweltering*, N.Y. TIMES (Aug. 24, 2020), <https://perma.cc/V4A9-2N7J>; Sarah Mervosh, *Unsafe to Stay, Unable to Go: Half a Million Face Flooding Risk in Government Homes*, N.Y. TIMES (Apr. 11, 2019), <https://perma.cc/PS2S-44KZ>.

217. Disclosure of physical risk to corporate assets will also inform government efforts to make infrastructure and other investments that safeguard marginalized communities from further damage while spurring sustainable and resilient economic development. See, e.g., Exec. Order No. 14,008, § 219 (Jan. 27, 2021) (instructing federal agencies to develop “developing programs, policies, and activities to address the disproportionately high and adverse human health, environmental, climate-related and other cumulative impacts on disadvantaged communities, as well as the accompanying economic challenges of such impacts”).

VI.

HOW THE SEC CAN SECURE IMPROVED DISCLOSURES

As prior sections of the Article have established, current climate risk disclosure practices are not currently meeting the needs of investors or other market actors. Although the SEC has taken steps to strengthen its enforcement of the 2010 Guidance—for example, through the issuance of comment letters to encourage better reporting²¹⁸—mere codification of the 2010 Guidance would not yield sufficient disclosures. Rather, the SEC should promulgate more detailed disclosure requirements that ensure investors receive comparable, specific, and decision-useful information. This Section proceeds in two parts. First, it provides an overview of the SEC’s legal authority and how that authority relates to the benefits conveyed by improved climate risk disclosure. Second, it suggests pathways by which the SEC can coordinate with other organizations and leverage its authority to create an improved disclosure system.

In order to develop a climate risk disclosure regime that provides comparable, specific, and decision-useful information, the SEC should engage staff, seek input from stakeholders, and draw from other institutions’ best practices. Accordingly, this Article specifically recommends the SEC: (1) develop greater institutional expertise on climate risk, improving its ability to set new standards and detect omissions of material information; ; (2) coordinate regulatory actions across agencies with the use of interagency working groups; and (3) draw best practices from existing disclosure frameworks when crafting improved mandatory disclosure rules.

*A. An Overview of the SEC’s Authority**i. Setting Standards*

Disclosure plays a central role in the SEC’s operations. The SEC is authorized, under both the Securities Act and the Securities and Exchange Act, to promulgate rules for disclosure “as necessary or appropriate in the public interest or for the protection of investors.”²¹⁹ In its 1996 revisions to the Securities Act, Congress added Section 2(b), which provides:

218. Michael Littenberg & Marc Rotter, *SEC Highlighting the Need to Consider Climate Change Disclosures in SEC Filings*, HARV. L. SCH. F. ON CORP. GOV. (Oct. 24, 2021), <https://corpgov.law.harvard.edu/2021/10/24/sec-highlighting-the-need-to-consider-climate-change-disclosures-in-sec-filings/>.

219. Business and Financial Disclosure Required by Regulation S-K, Release No. 33-10064, 81 Fed. Reg. 23,915, 23,969-73 (Apr. 13, 2016) (citing Sections 7, 10, and 19(a) of the Securities Act of 1933, 15 U.S.C. §§ 77g(a)(10), 77j, and 77s(a); and

Whenever pursuant to this title the Commission is engaged in rulemaking and is required to consider or determine whether an action is necessary or appropriate in the public interest, the Commission shall also consider, in addition to the protection of investors, whether the action will promote efficiency, competition, and capital formation.²²⁰

SEC rulemaking that ensures corporations make sufficient climate risk disclosures would further each of these goals of investor protection, efficiency, competition, and capital formation.

a. Investor Protection

Sections II and III.C of this Article identified how climate risk is material to investor decision-making and how current disclosure systems are inadequate, leading to significant and widespread mispricing. Under the status quo, investors may be unaware of the physical and transition risks the corporations they invest in face and the implications of that exposure. Further, many of these risks affect entire markets and industries, making them harder to diversify away. Such non-diversifiable risk may necessitate greater investor protection.²²¹ An improved mandatory climate risk disclosure regime protects investors by preventing corporations from withholding material information that could affect an investor's expected returns.

b. The Public Interest: Efficiency, Competition, and Capital Formation

Section V.C showed how remedying mispricing also furthers the economy-wide goal of allocative efficiency, as prices that incorporate all available information about a corporation's financial prospects improve investors' ability to distribute capital to its highest-value use. In addition to furthering allocative efficiency, an improved climate risk disclosure regime would promote U.S. competitiveness and capital

Sections 3(b), 12, 13, 14, 15(d), and 23(a) of the Exchange Act of 1934, 15 U.S.C. §§ 78c(b), 78l, 78m(a), 78n(a), 78o(d), and 78w(a)).

While this statutory delegation of authority appears broad, the SEC has limited itself by interpreting its authority as cabined by its "core mission to promote investor protection, market efficiency and competition, and capital formation." Harper Ho, *supra* note 87, at 340-41 (citing Business and Financial Disclosure Required by Regulation S-K: Concept Release, 81 Fed. Reg. 23,916, 23,917, 23,922 & n.6 & n.55 (Apr. 22, 2016)).

220. National Securities Markets Improvement Act of 1996, Pub. L. No. 104-290, 110 Stat. 3425 (adding 15 U.S.C. § 77b(b) to the Securities Act of 1933 and 15 U.S.C. § 78c(f) to the Securities and Exchange Act of 1934).

221. See TCFD REPORT, *supra* note 9, at 34.

formation by increasing investor confidence. As an SEC petition for rulemaking observed:

Many other developed countries have already promulgated [environmental, social, and corporate governance disclosure] requirements, shaping the expectations of global investors. . . . To the extent that US companies fail to disclose information which global investors are being encouraged, and in some cases required, to consider, they will be at a disadvantage in attracting capital from some of the world's largest financial markets.²²²

As discussed above, many investors perceive current voluntary disclosures to be “highly uneven” as a result of the general lack of oversight or auditing from independent organizations.²²³ Without an improved mandatory regime, U.S. companies that voluntarily disclose their climate risk in accordance with best practices may still have a comparatively hard time attracting capital because investors lack assurances that the voluntary disclosures are trustworthy. Increasing investor confidence in climate risk disclosures “may well mobilize sources of capital from investors who are currently unwilling to invest given knowledge gaps or information symmetries.”²²⁴

The SEC thus has clear legal authority under its enabling statutes to engage in rulemakings that set improved mandatory standards for climate risk disclosure. Such regulations would protect investors and further the public interest in allocative efficiency, international competitiveness, and capital formation.

ii. *Initiating and Conducting Economic Research*

In addition to promulgating and enforcing regulations for the securities industry, the SEC has the authority to conduct its own research on market risks and financial trends. The SEC's Division of Economic and Risk Analysis (“DERA”) serves as the SEC's “think tank,” and is tasked with “facilitat[ing] capital formation through sound economic analysis and rigorous data analytics.”²²⁵ DERA participates in all of the activities of the SEC, including rulemaking and enforcement; its duties include “identifying and analyzing issues, trends, and innovations in the marketplace” and “working with outside

222. Cynthia A. Williams & Jill E. Fisch, Request for Rulemaking on Environmental, Social, and Governance, 3–6 (Oct. 1, 2018), <https://perma.cc/NDW4-3NW9>.

223. BROOKINGS REPORT, *supra* note 144.

224. Williams & Fisch, *supra* note 222, at 5.

225. *About the Division of Economic and Risk Analysis*, SECURITIES & EXCHANGE COMM'N, <https://perma.cc/6SGB-6PRN> (last visited Feb. 4, 2021).

experts in academia and industry to strengthen the Commission's foundation of market knowledge."²²⁶

DERA also plays an important role in facilitating standardized disclosure and detecting violations of securities law. Within DERA, the Office of Structured Disclosure "works . . . to design data structuring approaches for required disclosures . . . and works with investors, regulated entities, and the public to support the submission and use of structured data."²²⁷ Additionally, DERA's Office of Risk Assessments and Office of Data Science facilitates the efficient enforcement of federal securities law by "developing customized, analytic tools and analyses to proactively detect market risks indicative of possible violations."²²⁸

B. Recommended SEC Actions to Improve Climate Risk Disclosure

Drawing on the authorities discussed above, the SEC should issue new regulations that specifically require disclosure of climate risk. Rulemakings as contemplated here should build on the requirements of Regulation S-K to further standardize climate risk disclosure and resolve any interpretive ambiguities left by the 2010 Guidance. To ensure that these regulations elicit disclosures that are comparable, specific, and decision-useful, the Commission should take the following procedural steps. First, at the staff level, the Commission should develop greater institutional expertise on climate risk, improving its ability to set new standards and detect omissions of material information. Second, the Commission ought to coordinate its regulatory actions with other financial regulators and agencies with climate expertise. Third, in crafting its new disclosure requirements, the SEC should draw on best practices from voluntary and foreign disclosure regimes.

i. Recommendation 1: Develop Institutional Expertise on Climate Risk

As an initial matter, the SEC should take steps to improve its institutional expertise on climate risk.²²⁹ As previously noted, the lack of subject-matter expertise has hampered the agency's enforcement ef-

226. *Id.*

227. *Office of Structured Disclosure*, SECURITIES & EXCHANGE COMM'N, <https://perma.cc/S25E-R77F> (last visited Dec. 2, 2020).

228. SECURITIES & EXCHANGE COMM'N, *supra* note 225.

229. This should also be done in coordination with other U.S. financial regulators and particularly in collaboration with the Financial Stability Oversight Council, as discussed below.

forts. The SEC should thus hire advisors with expertise on climate risk to guide the agency through the regulatory process and to spearhead relevant research projects.²³⁰ The Commission could also rely on DERA to conduct economic analyses of the impacts of climate risk on financial markets, and integrate DERA's findings into the SEC's policymaking, rulemaking, and enforcement operations.

Securities regulators in other countries have undertaken similar research projects. The Bank of England's Prudential Regulation Authority ("PRA") has published reports on the impacts of climate change on PRA-regulated banks, as well as analyses of how banks have responded to climate risk.²³¹ The Canadian Securities Administrators has also issued a report on the state of climate risk disclosures, and plans to use those findings to develop "guidance and educational initiatives which are useful to issuers across a wide range of industries with respect to the business risks and opportunities and potential financial impacts of climate change," and to consider "new disclosure requirements regarding corporate governance in relation to business risks, including climate change-related risks, and risk oversight and management."²³²

SEC-directed research into climate risk would help the agency make informed, evidence-based decisions as it establishes new policies and rules. This knowledge would additionally help the SEC set priorities as it considers which industries are most urgently in need of improved climate risk disclosure and how best to regulate and structure disclosures. Sustainability reporting organizations, think tanks, scholars, and advocacy groups have already made important contributions to these subjects, and the SEC should not hesitate to leverage this valuable research.²³³ By centralizing and building on this body of

230. The SEC has already begun taking this step, announcing the hiring of a Senior Policy Advisor for Climate and ESG. Press Release, Securities & Exchange Comm'n, Satyam Khanna Named Senior Policy Advisor for Climate and ESG (Feb. 1, 2021), <https://perma.cc/6ZP7-ED4P>.

231. See, e.g., BANK OF ENGLAND PRUDENTIAL REG. AUTH., *TRANSITION IN THINKING: THE IMPACT OF CLIMATE CHANGE ON THE UK BANKING SECTOR* (2018), <https://www.bankofengland.co.uk/-/media/boe/files/prudential-regulation/report/transition-in-thinking-the-impact-of-climate-change-on-the-uk-banking-sector.pdf>.

232. CANADIAN SECURITIES ADMIN., *CSA STAFF NOTICE 51-354, REPORT ON CLIMATE CHANGE-RELATED DISCLOSURE PROJECT*, at 3 (Apr. 5, 2018), <https://perma.cc/K2JE-XUYU>.

233. Scholarly work on climate risk disclosure and proposals to improve disclosure both span decades. See generally, e.g., Jeffrey M. McFarland, *Warming Up to Climate Change Risk Disclosure*, 14 *FORDHAM J. CORP. & FIN. L.* 281 (2009); Natalie Nowiski, *Rising Above the Storm: Climate Risk Disclosure and Its Current and Future Relevance to the Energy Sector*, 39 *ENERGY L.J.* 1 (2018); Kevin L. Doran & Elias L. Quinn, *Climate Change Risk Disclosure: A Sector by Sector Analysis of SEC*

knowledge through DERA, the SEC can identify which of its disclosure regulations are most effective, anticipate new trends in the marketplace, and find solutions to regulatory challenges as they arise.

Research on the current state of climate risk disclosure is also useful to SEC regulatory enforcement. As discussed in Section IV.B, from 2016 to 2020, the SEC did not engage in a serious effort to enforce its 2010 Climate Disclosure Guidance, issuing only six comment letters to companies regarding the sufficiency and accuracy of their climate risk disclosures.²³⁴ This trend toward non-enforcement seems poised for change with the arrival of a new presidential administration and commissioners, but growth in the SEC's institutional expertise on climate change would also greatly enhance its ability to detect when companies have reported implausible or misleading estimates of their risk exposure. This increased threat of detection and enforcement would, in turn, incentivize corporations to share accurate information with the public. In particular, DERA's Offices of Risk Assessment and Data Science would be well suited to develop analytic tools analogous to those it already employs to detect violations of other securities laws.²³⁵ These tools, when applied to a standardized and improved disclosure regime, could greatly reduce the cost of enforcement for the SEC.

ii. Recommendation 2: Coordinate Regulatory Actions Across Agencies

While this Article focuses on the SEC, it is only one of several agencies across the federal government with regulatory authority relevant to climate risk disclosure. Other agencies—such as the CFTC, the Federal Reserve, the Federal Deposit Insurance Corporation (“FDIC”), and the Office of the Comptroller of the Currency—share financial oversight authority with the SEC, regulating financial markets, banks, investment companies, and other broker-dealers.²³⁶ Additionally, while the SEC is well positioned to develop expertise on some issues—such as the types of financial risk that particular

10-K Filings from 1995-2008, 34 N.C.J. INT'L L. & COM. REG. 721 (2009); Melissa K. Scanlan, *Climate Risk Is Investment Risk*, 35 NAT. RESOURCES & ENV'T 18 (2020); Constance Wagner, *Corporate Environmental Reporting and Climate Change Risk: The Need for Reform of Securities and Exchange Commission Disclosure Rules*, 11 TRANSACTIONS: TENN. J. BUS. L. 151 (2009).

234. CERES, *supra* note 20, at 31 (citing Andy Green & Andrew Schwartz, *Corporate Long-Termism, Transparency, and the Public Interest*, CTR. FOR AM. PROGRESS (Oct. 2, 2018), <https://perma.cc/3QVX-S2TY>).

235. See *supra* note 228.

236. CERES, *supra* note 20, at 15.

changes in climate conditions could pose to particular industries—other agencies, such as the Environmental Protection Agency (“EPA”) and National Oceanic and Atmospheric Administration (“NOAA”) have superior institutional knowledge on the extent to which the climate can be expected to change in a given time period.

Therefore, it is important that the SEC coordinate with other agencies both to leverage their expertise and to ensure consistency across distinct but overlapping regulatory regimes.²³⁷ The SEC should explore ways to coordinate with relevant federal agencies through, for example, an Interagency Working Group (“IWGs”). IWGs, convened by executive order or using other source of authority, have been deployed successfully in other regulatory contexts to address technical issues that require a unified regulatory approach.²³⁸ For example, after *Center for Biological Diversity v. National Highway Traffic and Safety Administration*, a case in which the Ninth Circuit remanded a set of corporate average fuel economy standards due to the agency’s failure to account for the value of reducing greenhouse gas emissions when determining the standards’ stringency,²³⁹ This coordination effort could also occur through an IWG or other mechanism convened by the Financial Stability Oversight Council (“FSOC”),²⁴⁰ a collaborative body consisting of each of the federal financial regulators and charged with facilitating regulatory coordination.²⁴¹

237. The SEC should likewise consider working with international regulators. In a January executive order, President Biden directed the Secretary of the Treasury to “ensure that the United States is present and engaged in relevant international fora and institutions that are working on the management of climate-related financial risks,” Exec. Order No. 14,008, § 102(g)(i) (Jan. 27, 2021), but the Commission should also coordinate and learn from international endeavors.

238. Notably, interagency working groups are generally not convened by individual executive agencies, but are established through Presidential executive orders. *See, e.g.*, Exec. Order No. 12,898, § 1-102 (1994) (creating interagency working group on environmental justice); Exec. Order No. 12,866, § 4(d) (1993) (providing authority for regulatory working group that coordinated efforts to set a consistent social cost of carbon); Exec. Order No. 13,439, § 1 (2007) (convening interagency working group on import safety).

239. 538 F.3d 1172 (9th Cir. 2008).

240. FSOC has created interagency working groups previously, for example, convening a IWG on hedge funds in 2016 to better understand their activities and assess their potential risk to financial stability. Press Release, Dep’t of Treasury, Financial Stability Oversight Council Releases Statement on Review of Asset Management Products and Activities (Apr. 18, 2016), <https://perma.cc/M9T9-M9J5>.

241. Dodd-Frank Wall Street Reform and Consumer Protection Act, § 111, 12 U.S.C. § 5322(a)(2)(E). FSOC was created by the Dodd Frank Act for three primary purposes: identifying risk to financial stability; promoting market discipline; responding to emerging risks to stability. *Id.* § 5322(a)(1). FSOC is chaired by the Secretary of Treasury, and has nine other voting members including the heads of the Board of Governors of the Federal Reserve System, the Office of the Comptroller of the Cur-

One issue for which an IWG or other coordinating mechanism may prove particularly useful is climate scenario analysis. The TCFD recommends that corporations engage in climate scenario analysis, but research by the Institute for Climate Economics indicates that very few companies actually engage in such analysis, and the companies that do vary widely in their assumptions, modeling techniques, and approaches.²⁴² Many corporations, express confusion as to how climate scenarios should be understood and used.²⁴³ The SEC could improve on the TCFD recommendations by providing more detailed guidance on how scenario analyses should be conducted, standardizing which scenario (or menu of scenarios) corporations should consider, or mandating fuller disclosure of the assumptions underlying the company's chosen scenario(s) and the results of its analyses. However, other U.S. regulators, such as the Federal Reserve, have expressed interest in using scenario analysis to assess the resilience of the financial system and the economy to climate risk.²⁴⁴ Additionally, NOAA and EPA have relevant expertise on climate modeling techniques and may be better positioned to determine which warming scenarios are most useful to consider, which modeling assumptions are most reasonable, and how to translate projected physical impacts into economic impacts that can be integrated into financial models.²⁴⁵ Using an IWG to address these questions could help the SEC and the Federal Reserve (and other financial regulators) craft their scenario-analysis requirements more efficiently and ensure that the requirements do not conflict.

rency, the Consumer Financial Protection Bureau, the SEC, the FDIC, the CFTC, the Federal Housing Finance Agency, the National Credit Union Administration, and one independent member with insurance expertise appointed by the President. *About FSOC*, DEP'T OF THE TREASURY, <https://perma.cc/HVK9-AEJV> (last visited Feb. 1, 2021). In October 2021, FSOC released a report identifying climate risk as a threat to financial stability. FSOC, REPORT ON CLIMATE-RELATED FINANCIAL RISK (2021), <https://perma.cc/P5NR-KS5F>.

242. CHARLOTTE VAILLES & CLÉMENT MÉTIVIER, INST. FOR CLIMATE ECONOMICS, VERY FEW COMPANIES MAKE GOOD USE OF SCENARIOS TO ANTICIPATE THEIR CLIMATE-CONSTRAINED FUTURE (2019), <https://perma.cc/YXF7-QNWJ>.

243. *Id.*

244. Lael Brainard, Gov'r, Bd. of Gov'rs of the Fed. Reserve Sys., Strengthening the Financial System to Meet the Challenge of Climate Change (Dec. 18, 2020), <https://perma.cc/K965-2LP4>. Other central banks, like the Bank of England, have likewise expressed interest in scenario analysis. *See, e.g.*, Press Release, Bank of England, The Bank of England Is Restarting the Climate Biennial Exploratory Scenario (CBES) (Nov. 13, 2020), <https://perma.cc/8W28-G5WX>.

245. *See generally* Tanya Fiedler et al., *Business Risk and the Emergence of Climate Analytics*, NATURE CLIMATE CHANGE (2021), <https://perma.cc/WSB7-QFM5> (discussing use of climate models in financial risk assessment).

iii. *Recommendation 3: Draw Best Practices from Existing Frameworks and Standards*

Lastly, the SEC's new disclosure regulations should draw from best practices established by voluntary disclosure programs and disclosure regimes in other countries, which are the product of years of research and practitioner input and are thus highly reflective of the needs of both users and preparers of disclosures. Specifically, the Commission should look to the TCFD framework and the SASB standards when determining which standards and metrics should apply to a given industry. SASB's focus on creating standards that are maximally useful for investors makes it a particularly valuable resource for the SEC. A rulemaking consistent with the existing TCFD framework and SASB standards would also decrease the compliance costs for companies that are already voluntarily disclosing climate risk under these regimes.

Additionally, because other countries have begun to structure their disclosure regimes based on the TCFD framework, adopting a similar approach in the United States could decrease corporations' cost of compliance and improve their ability to attract capital from foreign investors seeking comparable information. The European Union, the United Kingdom, and New Zealand have all initiated regulatory actions to mandate climate risk disclosure, and all three have used the TCFD as a starting point for their respective disclosure frameworks.²⁴⁶ The UK Financial Reporting Council has also encouraged companies to disclose using SASB metrics.²⁴⁷

A robust climate risk disclosure framework would likely contain several key elements: (1) a series of broadly applicable disclosures for all registrants, similar to the TCFD requirements; (2) a number of universal line-item disclosures that would provide all investors with comparable information; and (3) a series of industry-specific metrics and standards that address climate issues material to particular industries, similar to the SASB framework. The TCFD provides a common core

246. See Frances Schwartzkopff, *EU Wants Tougher Climate Disclosure Rule as Firms Lag Behind*, BLOOMBERG (Apr. 21, 2021), <https://www.bloomberg.com/news/articles/2021-04-21/eu-wants-tougher-climate-disclosure-rules-as-firms-lag-behind>; Vanessa Havard-Williams et al., *UK Paves Way for Mandatory TCFD Climate Disclosure for Companies and Other Organisations by 2025*, LINKLATERS (Nov. 12, 2020) <https://www.linklaters.com/en/insights/blogs/sustainable-futures/2020/november/uk-paves-way-for-mandatory-tcf-d-climate-disclosure-for-companies-and-other-organisations-by-2025>; NZ Ministry for the Env't, *Mandatory Climate Related Disclosures* (Apr. 2021), <https://environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/mandatory-climate-related-financial-disclosures/>.

247. Havard-Williams et al., *supra* note 246.

of disclosures that are relevant to all companies, but its standards, which are broadly worded, may not by themselves elicit comparable disclosure.²⁴⁸ Therefore, a series of more concrete line items and metrics will be helpful to ensure that disclosures are maximally comparable, specific, and decision-useful for investors. Universal line-items may include, for example, materially relevant state and federal climate legislation and regulation, or the total value of fossil fuel-related assets owned or managed by the registrant. Both of these line items would be relevant to understanding the transition-related risks associated with any registrant's business.

This is not to say, however, that the SEC's new disclosure regulations should merely codify the TCFD framework and SASB standards. The Commission should also rely on its own economic research, work done by international counterparts, and recommendations from other sustainability reporting organizations and climate change experts, and it should deviate from TCFD and SASB requirements where it finds that an alternative approach to disclosure would yield superior results. Still, using these two voluntary programs as a basis point for regulation will allow the agency to take advantage of years of research on best practices for climate risk disclosure.²⁴⁹

248. The eleven TCFD recommendations include a mix of line-item disclosures and broader, principles-based disclosures. For example, in the "Metrics and Targets" section, the TCFD recommends that registrants disclose Scope 1, 2, and 3 greenhouse gas emissions, and that registrants "describe the targets used by the organization to manage climate-related risks and opportunities." The first recommendation, as a numeric metric of climate risk exposure, is more likely to elicit comparable information across corporations than the second.

249. An improved climate risk disclosure regime should be comprised of industry-specific reporting requirements, and the SEC should consider building these reporting requirements through an *iterative approach* to sector-specific rulemaking or guidance. Under an iterative approach, the SEC would establish a disclosure regime that could be revised and expanded over time. This process could begin with an initial rulemaking that enacts improved reporting requirements that are (1) widely agreed upon to be decision-useful for investors, and (2) applicable across all industries. For example, the TCFD recommends that all companies engage in scenario analysis, which asks corporations to assess the resilience of their business strategies against a range of warming scenarios and the associated physical and transition risk. As the TCFD explains, scenario analysis is useful for investors and corporations across all industries because it "clarifies the predictable and uncertain elements in different futures," and encourages the development of alternative strategies that could bolster a corporation's resilience. TASK FORCE ON CLIMATE-RELATED FIN. DISCLOSURES, GUIDANCE ON SCENARIO ANALYSIS FOR NON-FINANCIAL COMPANIES 1 (2020), <https://perma.cc/BL4V-227L>. The SEC could then promulgate industry-specific requirements, similar to SASB's standards, and consider prioritizing disclosure rulemakings for industries that are most broadly exposed to climate risk—industries such as energy, agriculture, clothing, and real estate.

VII.

CONCLUSION

Climate change is ushering in a new set of challenges and opportunities for corporations and their investors. Climate risk disclosure has not kept pace, as current regulatory rules and voluntary regimes do not provide investors and other financial stakeholders access to comparable, specific, and decision-useful information. Without proper disclosure of climate-related financial risks and the strategies undertaken to manage those risks, creditors and shareholders lack the information necessary to price assets correctly, jeopardizing economic stability. These problems have led financial experts and institutional investors to call for an improved mandatory climate risk disclosure regime with standardized reporting requirements.

The SEC should respond to these growing demands with new rulemakings that would set mandatory climate risk disclosure requirements for public companies. In order to ensure that disclosures are maximally useful, the SEC should coordinate with other agencies through interagency working groups and solicit input from financial and climate experts, investors, and voluntary reporting organizations. Additionally, the SEC should develop its own institutional expertise on climate risk by conducting economic research on climate risk through DERA. Taken together, these actions will facilitate informed investing, sustainable growth, and a more resilient economy.

This Article has refrained from specifying the ideal substance of new disclosure rules, focusing instead on process-oriented recommendations. More research and advocacy should, however, be dedicated to the substantive questions that the SEC will confront in crafting an improved disclosure regime. Among myriad other considerations, such questions include the desirability of standardizing climate scenarios, designating an authoritative source for climate information, setting relevant time horizons, or establishing assurance requirements in conjunction with the Public Company Accounting Oversight Board. The process-oriented recommendations made herein will put the SEC in a better position to consider these substantive issues and craft disclosure rules that elicit comparable, specific, and decision-useful information.