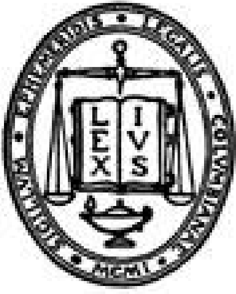

CORPORATE (NON)DISCLOSURE OF CLIMATE CHANGE INFORMATION

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CORPORATE (NON)DISCLOSURE OF CLIMATE CHANGE INFORMATION

*Roshaan Wasim**

As the impacts of climate change become increasingly severe and perceptible, corporations that continue to disregard the risks created by the Earth's shifting climate stand to suffer significant financial harm. Particular sectors, such as the oil and gas industry, are especially susceptible to the effects of climate change and are already experiencing losses in value due to extreme weather events, disrupted operations, and environmental regulations. Despite a growing number of investors demanding more information from companies about their vulnerabilities to climate change, there is virtually no discussion of climate change risks in publicly traded companies' filings with the Securities and Exchange Commission and on other public platforms. This indifference to climate change matters is potentially harmful to investors, who may be trading inaccurately priced securities that fail to account for the risks posed by climate change.

A number of recent investigations and litigation alleging securities fraud based on publicly traded companies' failure to disclose climate change risks represent an attempt to ensure that investors have access to critical information about the true value of their holdings. This Note cautions that such allegations of securities fraud may become more common in the near future if companies continue to ignore, misrepresent, or fail to disclose the effects of climate change on their operations and financial value. In light of the growing threat of such securities fraud litigation, this Note examines different theories that plaintiffs in these suits can advance to argue that climate change information falls within the ambit of existing mandatory disclosure laws. By encouraging companies to assess and disclose climate change risks, these lawsuits are not only critical to maintaining transparency and efficiency in financial markets but they may also spur innovation and new modes of thinking that can help mitigate the harmful impacts of climate change.

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INTRODUCTION

Major Climate Report Describes a Strong Risk of Crisis as Early as 2040[1]

PG&E: The First Climate-Change Bankruptcy, Probably Not the Last[2]

Climate Change Could Spark Another Great Recession. This Time, It May Be Permanent[3]

Such headlines, while provocative, derive from scientific research and data that are predicting increasingly certain and unfavorable effects on the global economy due to the Earth's changing climate.[4] Although the potential long-term effects of climate change have been widely discussed and documented, there has been less focus on how climate change can presently impact the financial value of a company's assets and operations. The Securities and Exchange Commission (SEC), whose mandate includes protecting investors from fraudulent and misleading corporate practices by requiring publicly traded companies to disclose certain information in periodic reports,[5] has largely disregarded the disclosure of climate change risks.[6] A number of recent investigations and lawsuits,[7] however, allege that investors are increasingly at risk of making uninformed investment decisions based on inadequate and, in some cases, intentionally misleading statements by companies about their vulnerabilities to the effects of climate change.

One of the earliest such investigations was launched in 2007 when the Office of the New York State Attorney General (NYAG) issued subpoenas seeking internal documents from several energy companies as part of an inquiry into the companies' failure to disclose climate change risks.[8] Three of these energy companies eventually reached settlement

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1. Coral Davenport, Major Climate Report Describes a Strong Risk of Crisis as Early as 2040, N.Y. Times (Oct. 7, 2018), https://www.nytimes.com/2018/10/07/climate/ipcc-climate-report-2040.html (on file with the *Columbia Law Review*).

2. Russell Gold, PG&E: The First Climate-Change Bankruptcy, Probably Not the Last, Wall St. J. (Jan. 18, 2019), https://www.wsj.com/articles/pg-e-wildfires-and-the-first-climate-change-bankruptcy-11547820006 (on file with the *Columbia Law Review*).

3. Justin Worland, Climate Change Could Spark Another Great Recession. This Time, It May Be Permanent, Time (June 29, 2017), http://time.com/4837020/climate-change-economy-recession/ [https://perma.cc/MD6A-UG6G].

4. See infra section I.A (discussing the potential negative impacts of climate change on the global economy as a whole, as well as on particular companies and industries); see also infra notes 21–24 and accompanying text (discussing the scientific evidence in support of human-induced climate change).

5. See Division of Corporation Finance, SEC, https://www.sec.gov/page/corpfin-section-landing [https://perma.cc/PV7J-3QM4] (last modified Jan. 31, 2017).

6. See infra section III.A.1 (discussing the lack of climate change information in companies' SEC filings and the SEC's relative inattention to this matter).

7. See infra notes 12–20 and accompanying text.

8. See Katrina Fischer Kuh, Impact Review, Disclosure, and Planning, *in* The Law of Adaptation to Climate Change 543, 557 (Michael B. Gerrard & Katrina Fischer Kuh eds.,

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agreements with the NYAG in which they agreed to disclose material financial risks related to the effects of climate change, such as increases in extreme weather events and changes in temperature and precipitation levels.[9] In late 2015, the NYAG reached a similar settlement with Peabody Energy Corporation (Peabody), the world's largest publicly traded coal company.[10] As part of the settlement, Peabody agreed to disclose specific climate change risks and to "refrain from any future representations that the company cannot reasonably predict the impact of climate policies on its future business."[11]

Just a few days before concluding the Peabody investigation, the NYAG revealed that it had initiated another fraud investigation against ExxonMobil Corporation (Exxon), one of the world's largest publicly traded oil and gas companies.[12] The investigation was prompted by data uncovered by a group of Harvard University researchers that suggested Exxon had deliberately misrepresented its vulnerabilities to climate change over the past forty years, even as the company's internal scientists cautioned that climate change posed a serious threat to Exxon's future.[13] Over the course of its investigation, the NYAG uncovered "significant evidence" that Exxon used two sets of numbers, one disclosed publicly

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2012). The investigation was prompted by concerns that investors were being denied information about the companies' plans to build and operate coal-fired power plants, which posed a significant risk to the companies' financial profiles due to potential liabilities associated with carbon dioxide emissions. See Felicity Barringer & Danny Hakim, New York Subpoenas 5 Energy Companies, N.Y. Times (Sept. 16, 2007), http://www.nytimes.com/2007/09/16/nyregion/16greenhouse.html (on file with the *Columbia Law Review*).

9. Kuh, supra note 8, at 558.

10. Jessica Wentz, Peabody Energy Agrees to Update SEC Filings to Acknowledge Financial Risks of Climate Change Policies, Sabin Ctr. for Climate Change Law: Climate Law Blog (Nov. 9, 2015), http://blogs.law.columbia.edu/climatechange/2015/11/09/peabody-energy-agrees-to-update-sec-filings-to-acknowledge-financial-risks-of-climate-change-policies/ [https://perma.cc/V2A4-GL8R].

11. Id. This settlement concluded a two-year fraud investigation that revealed Peabody had consistently denied its ability to make accurate predictions about the effects of climate change on the company's operations in its filings with the SEC. Id. These denials occurred despite the fact that Peabody had conducted internal market projections about the effects of climate change on its financial profile and was aware of significant and specific risks, such as projections that the federal government's existing regulations regarding greenhouse gases would reduce the value of Peabody's Southern Powder River Basin coal by thirty-eight percent and the value of its Illinois Basin coal by thirty-three percent by the year 2025. Id.

12. See Press Release, Union of Concerned Scientists, Over 100 New York Scientists Urge NY Attorney General to Pursue ExxonMobil Investigation to the Fullest Extent of the Law (Apr. 21, 2017), http://www.ucsusa.org/press/2017/over-100-new-york-scientists-urge-ny-attorney-general-pursue-exxonmobil-investigation [https://perma.cc/S4SR-YQFW]; Who We Are, ExxonMobil, http://corporate.exxonmobil.com/en/company/about-us [https://perma.cc/FKJ7-JGS7] (last visited Mar. 1, 2019).

13. See Jessica Shankleman, Exxon Duped Public over Climate Concerns, Harvard Research Says, Bloomberg Law (Aug. 23, 2017), https://www.bloomberglaw.com/document/X9P0Q4TO000000 (on file with the *Columbia Law Review*).

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and one kept secret, to calculate the impact of climate change on the company's operations.[14] Based on its findings, the NYAG filed a lawsuit against Exxon in October 2018, which "pose[s] a financial threat to Exxon that could run into the hundreds of millions of dollars or more" if the court accepts the allegation that Exxon misled shareholders regarding its vulnerabilities to climate change.[15]

The Massachusetts Attorney General is also investigating Exxon's knowledge and disclosure of climate change information, and the Supreme Court recently refused Exxon's request to block this investigation.[16] Prompted by mounting evidence of potential corporate malfeasance regarding climate change disclosures, a growing number of jurisdictions are proposing or initiating similar investigations into Exxon's corporate practices.[17]

The SEC has also taken steps to consider how climate change can presently impact a company's financial profile. In 2017, the SEC conducted an investigation into Exxon's valuation of its oil and gas reserves in view of low oil prices and government regulations on carbon emissions.[18] In addition to being embroiled in these investigations, Exxon is currently in the midst of a securities fraud class action in the Northern District of Texas (the "*Ramirez* lawsuit"), which alleges that the company failed to disclose climate change information and misrepresented the

14. Erik Larson, Exxon Must Disclose Accounting Details in New York Climate Probe, Bloomberg (Sept. 12, 2017), https://www.bloomberg.com/news/articles/2017-09-12/exxons-records-refusal-rejected-by-court-in-n-y-climate-probe (on file with the *Columbia Law Review*).

15. John Schwartz, New York Sues Exxon Mobil, Saying It Deceived Shareholders on Climate Change, N.Y. Times (Oct. 24, 2018), https://www.nytimes.com/2018/10/24/climate/exxon-lawsuit-climate-change.html (on file with the *Columbia Law Review*).

16. Greg Stohr, Exxon Rejected by U.S. Supreme Court on Climate Change Documents, Bloomberg Law (Jan. 7, 2019), https://www.bloomberglaw.com/document/XEVPFUH4000000 (on file with the *Columbia Law Review*).

17. See Lauren Kurtz, Increasing Number of Investigations Into Fossil Fuel Industry's "Disinformation Campaign," Sabin Ctr. for Climate Change Law: Climate Law Blog (May 6, 2016), http://blogs.law.columbia.edu/climatechange/2016/05/06/increasing-number-of-investigations-into-fossil-fuel-disinformation [https://perma.cc/7FYZ-YAVG] (reporting on similar investigations being conducted in other states such as California, New Hampshire, and the Virgin Islands); see also Nina Hart, Note, Moving at a Glacial Pace: What Can State Attorneys General Do About SEC Inattention to Nondisclosure of Financially Material Risks Arising from Climate Change?, 40 Colum. J. Envtl. L. 99, 137–38 (2015) (discussing how attorneys general from other states can support the NYAG in its investigations regarding potential fraud in corporate disclosures of climate change information).

18. Emily Flitter, New York Prosecutor Says Exxon Misled Investors on Climate Change, Reuters (June 2, 2017), https://www.reuters.com/article/us-usa-climatechange-exxon/new-york-prosecutor-says-exxon-misled-investors-on-climate-change-idUSKBN18T1XK [https://perma.cc/P8TB-X9EK]. The SEC later closed the investigation without taking any action against the company. Dave Michaels & Bradley Olson, SEC Drops Probe of Exxon's Climate-Change Disclosures, Wall St. J., https://www.wsj.com/articles/sec-drops-probe-of-exxons-climate-change-disclosures-1533317730 (on file with the *Columbia Law Review*) (last updated Aug. 3, 2018).

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effects of climate change on certain company assets.[19] Exxon filed a motion to dismiss on September 26, 2017, which was largely denied by the district court, save for a few claims, on August 14, 2018.[20]

In light of these prominent developments and the increasingly accurate scientific projections regarding the effects of climate change on the corporate sector, companies may need to reevaluate their discussion of climate change risks in SEC filings and other public statements from company officials. This Note cautions that corporations may be facing a heightened risk of fraud investigations or litigation, similar to those discussed above, if they continue to ignore or misrepresent the short-term and long-term effects of climate change on their operations and finances. In particular, this Note focuses on the liabilities that can arise from fraudulent disclosures under the federal securities laws.

Part I discusses the potential effects of climate change, both positive and negative, on a company's operations and finances. Part II describes the SEC's disclosure regime, identifies mandatory disclosure requirements that are most likely to implicate climate change information, and provides a brief overview of federal securities fraud with a focus on the element of "materiality" in the context of climate change disclosures.

Part III dives into the crux of the problem: Whereas companies' current disclosures are woefully inadequate at discussing the risks of climate change primarily based on the rationale that climate change risks are too speculative or indeterminable to be disclosed, a growing body of data can pinpoint significant and quantifiable consequences for corporations as a result of climate change. When coupled with an increasing interest in climate change disclosure from investors, these factors suggest that companies may soon be subject to more lawsuits similar to *Ramirez*, and that such lawsuits are more likely to succeed. In light of this broader exposure to the threat of litigation based on inadequate corporate disclosure of climate change information, Part IV approaches potential solutions from two directions: first, by considering how corporations can voluntarily improve their disclosures to avoid

19. See Consolidated Complaint for Violations of the Federal Securities Laws at 2, Ramirez v. Exxon Mobil Corp., 334 F. Supp. 3d 832 (N.D. Tex. 2018) (No. 3:16-cv-3111-K), 2017 WL 3188487 [hereinafter Ramirez Consolidated Complaint]. The original complaint in the case was filed by investor Pedro Ramirez, Jr., in the Northern District of Texas. See Complaint for Violations of the Federal Securities Laws at 1, *Ramirez*, 334 F. Supp. 3d 832 (No. 3:16-cv-3111-K), 2016 WL 6594861 [hereinafter Ramirez Initial Complaint]. A consolidated complaint was filed a few months later, which named the Greater Pennsylvania Carpenters Pension Fund as the lead plaintiffs and designated the class period as extending from March 31, 2014, to January 30, 2017. See Ramirez Consolidated Complaint, supra, at 1–2.

20. See *Ramirez*, 334 F. Supp. 3d at 859–60 (describing the court's ruling on Exxon's motion to dismiss). See generally Defendants' Motion to Dismiss the Consolidated Complaint and Brief in Support, *Ramirez*, 334 F. Supp. 3d 832 (No. 3:16-cv-3111-K), 2017 WL 4274325 [hereinafter Exxon Motion to Dismiss] (outlining Exxon's arguments for dismissing the case at the pleadings stage).

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fraud charges, and second, by looking at how plaintiffs can overcome some of the legal hurdles associated with establishing corporate liability for failure to disclose climate change information. The latter solution rests on the assumption that a credible risk of litigation—and a risk of credible litigation—will compel companies to evaluate and consider their vulnerabilities to climate change in a more serious manner.

I. CLIMATE CHANGE: RISKS, BENEFITS, AND IMPACT ON CORPORATE VALUE

This Part begins by looking at the different types of risk that companies are exposed to as a result of climate change. Beyond these risks, however, climate change also presents opportunities for financial gain, which are discussed in section I.B.

A. *The Physical and Financial Risks Associated with Climate Change*

There is overwhelming scientific evidence that human-induced changes in the Earth's climate are an urgent and pressing concern.[21] Climate change has the potential to affect global capital markets and individual companies' operations in significant ways, both directly and indirectly, and it is crucial for investors to understand these risks in order to make informed short- and long-term investment decisions.[22] Importantly,

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21. The Intergovernmental Panel on Climate Change (IPCC) is one of the leading authorities in support of this proposition. See IPCC Factsheet: What Is the IPCC?, Intergovernmental Panel on Climate Change (Aug. 30, 2013), https://www.ipcc.ch/site/assets/uploads/2018/02/FS_what_ipcc.pdf [https://perma.cc/N66W-66DA]. A report issued by the IPCC in 2014 unequivocally states that "[h]uman influence on the climate system is clear, and recent anthropogenic emissions of greenhouse gases are the highest in history." IPCC, Climate Change 2014 Synthesis Report: Summary for Policymakers 2 (2014), https://www.ipcc.ch/site/assets/uploads/2018/02/AR5_SYR_FINAL_SPM.pdf [https://perma.cc/9RWW-VZ2V]. The report goes on to warn that "[r]ecent climate changes have had widespread impacts on human and natural systems [and] . . . [c]ontinued emission of greenhouse gases will cause further warming and long-lasting changes in all components of the climate system, increasing the likelihood of severe, pervasive and irreversible impacts for people and ecosystems." Id. at 2, 8. For a detailed and comprehensive overview of the impact of climate change on specific regions and industries in the United States, see generally National Climate Assessment, U.S. Global Change Res. Program, https://nca2014.globalchange.gov [https://perma.cc/EVG4-8XP7] (last visited Jan. 26, 2019).

22. One study of climate change effects on the asset management industry estimated that climate change will cause "permanent, present value losses to current manageable assets of 3% on average and up to 10% at extreme outcomes," with the total value at risk to all global assets ranging between $4.2 trillion and $43 trillion by the end of the century. Christopher Watts, The Economist Intelligence Unit, The Cost of Inaction: Recognising the Value at Risk from Climate Change 41 (2015), https://www.eiuperspectives.economist.com/sites/default/files/The%20cost%20of%20inaction_0.pdf [https://perma.cc/K8D6-74JW] [hereinafter The Economist Report]. In April 2015, the multinational bank HSBC issued a report to its clients warning about the potential for fossil fuel assets to become stranded due to climate change regulation and technological innovations in alternative energy sources, noting that "the risks of this occurring are growing" and that investors should "devise a strategy on how to manage exposure to high-cost and high-carbon assets." Ashim

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the impact of climate change will not be restricted to the most vulnerable industries—since indirect impacts will affect the entire global economy, investors "cannot simply avoid climate risks by moving out of vulnerable asset classes."[23] The risks associated with climate change are also unique in that they are cumulative over time. A 2014 report emphasized that "[b]y not acting to lower greenhouse gas emissions today, decisionmakers put in place processes that increase overall risks tomorrow, and each year those decisionmakers fail to act serves to broaden and deepen those risks."[24]

The discussion below identifies three particular ways climate change can hurt a company's financial value: by disrupting a company's supply chains and operations, increasing the cost of compliance with environmental regulations and litigation, and damaging a company's public reputation.

1. *Disruption to Supply Chains and Operations.* — The physical impacts of climate change have the ability to severely disrupt a company's supply chains and operations. These physical impacts can be the result of long-term effects of climate change—such as changes in sea levels, the arability of farmland, and water availability and quality—or the result of one-time catastrophic events that are accelerating in frequency.[25] Not only is climate

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Paun, Zoe Knight & Wai-Shin Chan, HSBC Glob. Research, Stranded Assets: What Next? 1, 13 (2015), https://www.businessgreen.com/digital_assets/8779/hsbc_Stranded_assets_what_next.pdf [https://perma.cc/JA9E-8TZT].

23. The Economist Report, supra note 22, at 3; see also Kathy Hibbard et al., U.S. Glob. Change Research Program, Energy, Water, and Land Use, *in* Climate Change Impacts in the United States 257, 259 (2014), http://s3.amazonaws.com/nca2014/low/NCA3_Full_Report_10_Energy_Water_Land_LowRes.pdf [https://perma.cc/6Y3C-QPHS] ("Energy production, land use, and water resources are linked in increasingly complex ways. . . . The links between and among energy, water, and land sectors mean that they are susceptible to cascading effects from one sector to the next."); Task Force on Climate-Related Fin. Disclosures, Final Report: Recommendations of the Task Force on Climate-Related Financial Disclosures iii (2017), https://www.fsb-tcfd.org/wp-content/uploads/2017/06/FINAL-TCFD-Report-062817.pdf [https://perma.cc/26UC-YHL8] [hereinafter Task Force Report] ("[T]he transition to a lower-carbon economy requires significant and, in some cases, disruptive changes across economic sectors and industries . . . ."); Stefano Battiston, Antoine Mandel, Irene Monasterolo, Franziska Schütze & Gabriele Visentin, A Climate Stress-Test of the Financial System, 7 Nature Climate Change 283, 283 (2017) (assessing financial actors' exposure to the fossil fuel sector via equity holdings and finding that while direct exposure is small (between four and thirteen percent), the financial system's interconnectedness means that up to forty-eight percent of equity holdings face indirect exposure to climate change risks).

24. The Risky Bus. Project, The Economic Risks of Climate Change in the United States: A Climate Risk Assessment for the United States 3–4 (2014), https://riskybusiness.org/site/assets/uploads/2015/09/RiskyBusiness_Report_WEB_09_08_14.pdf [https://perma.cc/2CYD-39YT].

25. See Commission Guidance Regarding Disclosure Related to Climate Change, Securities Act Release No. 9106, Exchange Act Release No. 61,469, 75 Fed. Reg. 6290 (Feb. 8, 2010) [hereinafter SEC 2010 Climate Change Disclosure Guidance]. The Financial Stability Board, an international body that aims to strengthen financial systems and increase the stability of financial markets, terms these long-term physical risks "chronic risks" and the risks associated with particular events "acute risks." See Task Force Report, supra note

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change increasing the likelihood of extreme weather events but it is also increasing the severity of such events when they do occur.[26] An uptick in the frequency and severity of extreme weather events is particularly troubling because the financial liabilities associated with such events appear to rise exponentially with their intensity.[27]

The SEC has noted several climate change–related scenarios involving disruption to business operations that might give rise to a duty to disclose, such as property damage (especially pertinent to companies with a presence near coastlines), interference with supply chains due to severe weather, increased insurance claims or premiums, and decreased agricultural capacity in areas affected by drought.[28]

2. *Increased Cost of Compliance and Litigation Related to Environmental Regulations.* — Environmental regulations have the potential to upset a company's future planning, including decisions about location and investment, and to increase production costs while decreasing productivity by requiring a company to adopt new processes.[29] For instance, stricter air quality controls, such as regulations governing ozone, have the potential to decrease a manufacturing plant's productivity by almost five percent, which represents an annual cost of approximately $21 billion to the entire

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23, at 6; About the FSB, Fin. Stability Bd., https://www.fsb.org/about/ [https://perma.cc/U3YH-A8A4] (last visited Jan. 26, 2019).

26. See Robinson Meyer, Global Warming Really Did Make Hurricane Harvey More Likely, Atlantic (Nov. 13, 2017), https://www.theatlantic.com/science/archive/2017/11/global-warming-really-did-make-hurricane-harvey-more-likely/545765/ [https://perma.cc/6X6M-BJ46]. The damage to business and property from the 2017 Atlantic hurricane season, which saw several major hurricanes—Harvey, Irma, and Maria, among others—exemplifies some of the ways in which extreme weather events can affect a company's operations. See, e.g., Factbox-Effect of Hurricanes Harvey and Irma on Key U.S. Companies, Reuters (Sept. 26, 2017), https://uk.reuters.com/article/storm-companies-impact/factbox-effect-of-hurricanes-harvey-and-irma-on-key-u-s-companies-idUKL4N1LV4XR [https://perma.cc/D2HQ-48VB] (listing the impact of Hurricanes Harvey and Irma on major U.S. companies such as Exxon, which had to shut down operations at a large oil refinery in Texas, and the retailer Francesca's Holdings Corporation, which reported that its headquarters, distribution centers, and about forty boutiques in Texas were impacted).

27. For instance, one study found that, between 1900 and 2005, Category 3, 4, and 5 hurricanes on the Saffir-Simpson Hurricane Wind Scale accounted for only twenty-four percent of landfalls in the United States but resulted in eighty-five percent of the total economic damage caused by all hurricanes making landfall. See Roger A. Pielke Jr., Joel Gratz, Christopher W. Landsea, Douglas Collins, Mark A. Saunders & Rade Musulin, Normalized Hurricane Damage in the United States: 1900–2005, 9 Nat. Hazards Rev. 29, 37–38 (2008); see also U.S. Gov't Accountability Office, GAO-07-285, Climate Change: Financial Risks to Federal and Private Insurers in Coming Decades Are Potentially Significant 16 (2007), http://www.gao.gov/assets/260/257686.pdf [https://perma.cc/TW6B-M9QY] [hereinafter GAO 2007 Climate Change Report].

28. See SEC 2010 Climate Change Disclosure Guidance, supra note 25, at 6291.

29. See Wayne B. Gray, IZA World of Labor, Environmental Regulations and Business Decisions 5–6, 9 (2015), https://wol.iza.org/uploads/articles/187/pdfs/environmental-regulations-and-business-decisions.pdf [https://perma.cc/3YW9-YWUA].

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manufacturing sector.[30] Companies such as Exxon whose operations produce large amounts of carbon dioxide emissions might be heavily taxed or regulated in the near future, a prospect that threatens to severely impact their financial value.[31] Indeed, the investigations and lawsuits currently besieging Exxon reflect the fact that it is a company whose value—and the price of its stock—is closely linked to the amount and valuation of its oil and gas reserves, thus making it particularly sensitive to changes in the Earth's climate and attendant government regulations.[32]

3. *Impact on Corporate Reputation.* — As the public becomes more aware of climate change and investors begin to take environmental considerations into account when making investment decisions,[33] a company may suffer financially if it gains a negative reputation in connection with climate change matters.[34] The SEC has recognized this as a potential indirect risk, noting that "[d]epending on the nature of a registrant's business and its sensitivity to public opinion, a registrant may have to consider whether the public's perception of any publicly available data relating to its greenhouse gas emissions could expose it to potential adverse consequences . . . resulting from reputational damage."[35]

4. *Heightened Risks for Particular Industries.* — The SEC has singled out particular goods and services that may be disproportionately impacted by climate change and accompanying environmental regulations, such as products that result in significant greenhouse gas emissions, services related to carbon-based energy sources, and the generation and transmission of energy from alternative energy sources.[36] The oil and gas industry, which includes companies such as Exxon, is one example of a

30. See Michael Greenstone, John A. List & Chad Syverson, The Effect of Environmental Regulation on the Competitiveness of U.S. Manufacturing 31 (Nat'l Bureau of Econ. Research, Working Paper No. 18,392, 2012), https://www.nber.org/papers/w18392.pdf [https://perma.cc/7G36-6RWK].

31. Cf. Eric A. Posner & Cass R. Sunstein, Climate Change Justice, 96 Geo. L.J. 1565, 1574–75 (2008) (noting a "strong consensus . . . that the world would benefit from significant steps to control greenhouse gas emissions").

32. See Ramirez Consolidated Complaint, supra note 19, at 2, 14.

33. See infra section III.B (describing the increased interest, especially from institutional investors, in climate change and environmental matters).

34. Cf. Kishanthi Parella, Reputational Regulation, 67 Duke L.J. 907, 913–14 (2018) (examining the "information-transmission function of litigation" and arguing that litigation and government investigations can produce a range of "reputational sanctions" for a company, including financial sanctions that result from "consumers who convert information of misdeeds into financial consequences for an organization").

35. SEC 2010 Climate Change Disclosure Guidance, supra note 25, at 6296. But see Victor B. Flatt, Act Locally, Affect Globally: How Changing Social Norms to Influence the Private Sector Shows a Path to Using Local Government to Control Environmental Harms, 35 B.C. Envtl. Aff. L. Rev. 455, 467 (2008) (noting various reasons why the risk of reputational harm may not deter many companies from engaging in environmentally harmful behavior).

36. See SEC 2010 Climate Change Disclosure Guidance, supra note 25, at 6296.

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sector facing heightened risks from the physical impacts of climate change. As of 2014, eighty-six percent of the oil refineries in the United States were located within ten feet of the local high tide line, making them especially vulnerable to extreme weather events and climate-related impacts such as rising sea levels.[37] In addition, certain industries, including the energy sector, may be especially "sensitive to greenhouse gas legislation or regulation."[38] Thus, in numerous ways, climate change is making the cost of doing business more expensive, the value of business more uncertain, and the future of business more risky.

B. *The Potential Financial Benefits Associated with Climate Change*

The consequences of climate change and environmental regulations are certainly not confined to negative effects on a company's financial profile. In fact, some companies stand to gain from the changes brought about by a shifting climate and the attendant rules and regulations.[39] CDP, an international organization that requests and collects voluntary climate change disclosures from companies, cities, and regions worldwide, reports that eighty-seven percent of companies who submit climate change data to CDP are able to identify business opportunities in connection with addressing climate risks.[40] The SEC also recognizes this fact and encourages companies to assess and disclose investment opportunities that might arise from climate change, such as "[n]ew trading markets for emission credits

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37. See Christina Carlson, Gretchen Goldman & Kristina Dahl, Union of Concerned Scientists, Stormy Seas, Risking Risks: What Investors Should Know About Climate Change Impacts at Oil Refineries 3 (2015), https://www.ucsusa.org/sites/default/files/attach/2015/02/stormy-seas-rising-risks-ucs-2015.pdf [https://perma.cc/P9EJ-ESHV]. The insurance sector is another example of an industry that faces heightened challenges in light of climate change, since an insurance company's entire business model depends on its ability to accurately predict potential risk factors. In fact, a 2008 report listed climate change as the top strategic risk facing the insurance industry in that year. See Ernst & Young, Strategic Business Risk 2008—Insurance 4 (2008), http://aaiard.com/11_2008/2008_Strategic_Business_Risk_-_Insurance.2.pdf [https://perma.cc/BTH3-W7TP]. There is evidence that insurance companies have started to recognize the risks associated with climate change and extreme weather events, and "many major private insurers are incorporating some near-term elements of climate change into their risk management practices." GAO 2007 Climate Change Report, supra note 27, at 5.

38. SEC 2010 Climate Change Disclosure Guidance, supra note 25, at 6296.

39. See id. at 6296 ("A registrant should not limit its evaluation of disclosure of a proposed law only to negative consequences. Changes in the law or in the business practices of some registrants in response to the law may provide new opportunities for registrants."); see also New Research Highlights Pipeline of Investment Opportunities in Sustainable Infrastructure Across C40 Cities, CDP (Apr. 4, 2017), https://www.cdp.net/en/articles/cities/new-research-highlights-pipeline-of-investment-opportunities-in-sustainable-infrastructure-across-c40-cities [https://perma.cc/J3V8-M8RN].

40. Why Your Company Should Disclose, CDP, https://www.cdp.net/en/companies-discloser [https://perma.cc/73KB-A639] (last visited Jan. 26, 2019).

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related to 'cap and trade' programs that might be established under pending legislation."[41]

The act of disclosing itself may help companies identify and alleviate climate change risks. "[B]y forcing companies to identify climate risks," mandatory disclosure "provide[s] companies with additional incentives to make their operations climate resilient[,] encourage[s] companies to avoid making infrastructure investments in climate-vulnerable areas[,] and . . . reduce[s] dependence on climate-threatened resources."[42] There is some empirical evidence that lends support to this suggestion. One study examining the effect of greenhouse-gas-emissions disclosure on corporate value for companies listed on the Main Market of the London Stock Exchange found that the most heavily regulated companies in terms of mandatory greenhouse-gas-emissions disclosure experienced significant *positive* valuation effects.[43] Another study looked at corporate investments in various "sustainability issues" and found that companies with strong ratings on sustainability issues that are material to that particular company or industry significantly outperformed companies with poor ratings on the same sustainability issues.[44] These studies and others[45] suggest that by ignoring climate change, companies are potentially missing out on opportunities to benefit financially.

41. SEC 2010 Climate Change Disclosure Guidance, supra note 25, at 6291.

42. Kuh, supra note 8, at 543.

43. See Philipp Krüger, Climate Change and Firm Valuation: Evidence from a Quasi-Natural Experiment 4–5 (Swiss Fin. Inst. Research Paper No. 15-40, 2015), https://ssrn.com/abstract=2565523 (on file with the *Columbia Law Review*). The study advanced a causal explanation for this phenomenon by comparing the valuation of firms immediately before and after the enactment of a United Kingdom law that requires particular U.K. companies listed on the Main Market of the London Stock Exchange to submit detailed information regarding their greenhouse gas emissions in their annual reports. Id. at 3. The study proposed several explanations for why companies affected by this law showed positive valuation effects, including the possibility that environmental regulation encourages a company to address inefficiencies through technological improvements and that "increased transparency and disclosure" make uninformed investors more inclined to trade rather than leave the market. Id. at 6.

44. See Mozaffar Khan, George Serafeim & Aaron Yoon, Corporate Sustainability: First Evidence on Materiality, 91 Acct. Rev., no. 6, 2016, at 1697, 1698. The study's methodology attempted to mitigate the effects of correlation in order to advance the strongest possible causal explanation for the relationship between investments in sustainability issues and firm value. See id. at 1704, 1712.

45. See Jo Confino, Sustainable Corporations Perform Better Financially, Report Finds, Guardian (Sept. 23, 2014), https://www.theguardian.com/sustainable-business/2014/sep/23/business-companies-profit-cdp-report-climate-change-sustainability [https://perma.cc/AH2U-LMKE] (reporting on a 2014 study by CDP that concluded that corporations actively involved in planning for and managing risks associated with climate change earn an eighteen percent higher return on investment than companies who do not engage in such activities); Ella Mae Matsumura, Rachna Prakash & Sandra C. Vera-Muñoz, Firm-Value Effects of Carbon Emissions and Carbon Disclosures, 89 Acct. Rev., no. 2, 2014, at 695, 698 (examining voluntarily disclosed carbon emissions data from S&P 500 firms between 2006 and 2008 and finding that the median value of firms that voluntarily disclosed their carbon

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As the evidence discussed above makes clear, climate change can impact a company's financial value in numerous ways, whether negative or positive, and it is important for investors to know and understand this information in order to engage in fully informed decisionmaking when purchasing and selling securities. Part II outlines the present structure of securities laws and regulations that facilitate and protect such decisions by investors.

II. THE SEC'S DISCLOSURE REGIME AND SECURITIES FRAUD

The recognition that "investors must have access to accurate information important to making investment and voting decisions in order for the financial markets to function effectively" was a principal motivation behind the enactment of mandatory disclosure laws.[46] Pursuant to Section 13(a) of the Securities Exchange Act of 1934, reporting companies, which includes those companies that have registered publicly to issue securities, must fulfill statutory disclosure requirements by filing annual, quarterly, and event-specific reports on Forms 10-K, 10-Q, and 8K respectively.[47] The section below examines certain requirements of Form 10-K in greater detail.

A. *Regulation S-K*

The foundations of the SEC's disclosure requirements are set forth in Regulation S-K,[48] pursuant to which a company must make a number of mandatory disclosures, including filing an annual report on Form 10-K.[49] A company's failure to disclose information required by Regulation S-K

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emissions is about $2.3 billion higher than comparable nondisclosing firms, even after correcting for variables such as self-selection bias); Stefanie Kleimeier & Michael Viehs, Carbon Disclosure, Emissions Levels, and the Cost of Debt 2 (Jan. 7, 2018) (unpublished manuscript), https://ssrn.com/abstract=2719665 (on file with the *Columbia Law Review*) (finding that corporations that voluntarily disclose their carbon emissions pay significantly lower interest costs on their bank loans as compared to their nondisclosing counterparts, which suggests that carbon emissions are an additional risk factor taken into account by banks when assessing the creditworthiness of a borrower).

46. See Business and Financial Disclosure Required by Regulation S-K, Securities Act Release No. 10,064, Exchange Act Release No. 77,599, 81 Fed. Reg. 23,916, 23,921 (Apr. 22, 2016). Not only are disclosure rules meant to protect individual investors, but they also serve to ensure that capital markets function in a fair and efficient manner. The contours of the SEC's rulemaking authority, as prescribed by Congress, further emphasize this point: When engaging in rulemaking, both the Securities Act of 1933 and the Securities Exchange Act of 1934 require the SEC to consider, in addition to the protection of investors, whether the action "will promote efficiency, competition, and capital formation." Securities Act of 1933, 15 U.S.C. § 77b(b) (2012); Securities Exchange Act of 1934, id. § 78c(f).

47. See 15 U.S.C. § 78m.

48. Codified at 17 C.F.R. pt. 229 (2018); see also Adoption of Disclosure Regulation and Amendments of Disclosure Forms and Rules, Securities Act Release No. 5893, Exchange Act Release No. 14,306, Investment Company Act Release No. 10,070, 42 Fed. Reg. 65,554 (Dec. 30, 1977) (adopting a set of disclosure regulations collectively termed Regulation S-K).

49. 17 C.F.R. § 249.310.

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does not automatically give rise to a charge of securities fraud,[50] though it might certainly create other forms of liability.

Over the years, the SEC has issued numerous interpretive letters and guidances that advise and instruct companies regarding their disclosure obligations.[51] In 2010, the agency issued a Commission Guidance Regarding Disclosure Related to Climate Change ("2010 Climate Change Disclosure Guidance") that served to clarify companies' obligation to disclose information related to climate change under existing rules and regulations.[52] While this was not the first time the SEC had addressed disclosure in relation to environmental matters,[53] it remains the most thorough treatment of the topic issued by the agency to date.[54]

The SEC's 2010 Climate Change Disclosure Guidance identifies specific portions of Form 10-K that might implicate climate change disclosures, three of which are discussed below: Item 101, Item 303, and Item 503(c).[55]

1. *Item 101: Description of Business.* — Item 101, "Description of business," requires a company to describe the "general development" of its business and the business of its subsidiaries over the past five years, as well as any information from earlier periods that is material[56] to learning about "the general development of the business."[57] The company is also required to disclose two particular pieces of information regarding environmental matters: (1) the material effect of complying with federal,

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50. As discussed below, in addition to demonstrating a company's failure to disclose required information, a plaintiff in a securities fraud suit must satisfy certain other elements in order to prevail. See infra section II.D.

51. See Other Commission Orders, Notices, and Information, SEC, https://www.sec.gov/rules/other.shtml [https://perma.cc/5KZD-F38T] (last updated Apr. 11, 2019).

52. See SEC 2010 Climate Change Disclosure Guidance, supra note 25, at 6290.

53. For a comprehensive list of interpretations and guidances issued by the SEC from 1972 to 2003 regarding the disclosure of environmental information, see U.S. Gov't Accountability Office, GAO-04-808, Environmental Disclosure: SEC Should Explore Ways to Improve Tracking and Transparency of Information 44–45 (2004), http://www.gao.gov/new.items/d04808.pdf [https://perma.cc/CS59-FJ6Z] [hereinafter GAO 2004 Report].

54. See Rick E. Hansen, Climate Change Disclosure by SEC Registrants: Revisiting the SEC's 2010 Interpretive Release, 6 Brook. J. Corp. Fin. & Com. L. 487, 487–89 (2012) (discussing the SEC's history of dealing with the disclosure of environmental matters, including the more recent focus on climate change disclosures).

55. In addition to Items 101, 303, and 503(c), the 2010 Climate Change Disclosure Guidance mentions Item 103, which concerns "legal proceedings" and requires a company to "[d]escribe 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." 17 C.F.R. § 229.103 (2018). Notably, any judicial or administrative proceeding that relates to "the discharge of materials into the environment" or that is "primary for the purpose of protecting the environment" is not considered to be "ordinary routine litigation incidental to the business" and thus must be disclosed. Instructions to Item 103, 17 C.F.R. § 229.103.

56. "Materiality" has a particular meaning in securities law, discussed in further detail below. See infra section II.D.

57. 17 C.F.R. § 229.101(a).

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state, and local regulations concerning the environment; and (2) "any material estimated capital expenditures for environmental control facilities."[58]

2. *Item 303: The MD&A.* — Item 303, "Management's discussion and analysis of financial condition and results of operation," is commonly referred to as the MD&A.[59] The MD&A requires a company to disclose "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," focusing in particular on three aspects of the company: liquidity, capital resources, and results of operations.[60]

The SEC has clarified disclosure obligations under the MD&A in two key concept releases: Release No. 33-6711, issued in 1987,[61] and Release No. 33-6835, issued in 1989.[62] In both of these, the SEC reiterated the importance of a "narrative" explanation of financial statements, which is meant to "give the investor an opportunity to look at the company through the eyes of management by providing both a short and long-term analysis of the business of the company."[63] Release No. 33-6711 distinguishes known trends, events, and uncertainties (which must be disclosed) from forward-looking information (which does not necessarily have to be disclosed).[64]

3. *Item 503(c): Risk Factors.* — Item 503(c) requires a company to provide "a discussion of the most significant factors that make the offering speculative or risky."[65] The company Vail Resorts, Inc., which manages and owns several ski resorts around the United States, provides an example of the type of climate change risk that might require disclosure under this section. The company's 2017 Form 10-K listed several potential risk factors, including exposure to "unfavorable weather conditions and the impact of

58. Id. § 229.101(c)(1)(xii).

59. Id. § 229.303.

60. Id. Companies are also required to report on any off-balance sheet arrangement that materially affects, or is reasonably likely to have a material effect on, the company's "financial condition, changes in financial condition, revenues or expenses, results of operations, liquidity, capital expenditures or capital resources." Id. § 229.303(a)(4).

61. Concept Release on Management's Discussion and Analysis of Financial Conditions and Operations, Securities Act Release No. 6711, Exchange Act Release No. 24,356, 38 SEC Docket 138 (Apr. 17, 1987) [hereinafter SEC Release No. 33-6711].

62. Management's Discussion and Analysis of Financial Condition and Results of Operations; Certain Investment Company Disclosures, Securities Act Release No. 6835, Exchange Act Release No. 26,831, Investment Company Act Release No. 16,961, 54 Fed. Reg. 22,427 (May 18, 1989) [hereinafter SEC Release No. 33-6835].

63. SEC Release No. 33-6711, supra note 61, at 140.

64. The distinction between these two is discussed further at infra section II.D.2.

65. 17 C.F.R. § 229.503(c). Companies do not need to include generic risks that could apply to any entity. Id.

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natural disasters."[66] Specifically, the company noted that it "experienced very poor conditions in the Lake Tahoe region during the 2012/2013, 2013/2014 and 2014/2015 North American ski seasons and experienced historic low snowfall across all . . . U.S. resorts during the 2011/2012 ski season."[67]

B. *The Sarbanes–Oxley Act of 2002*

The Sarbanes–Oxley Act of 2002 made several changes to disclosure laws with the aim of strengthening the accountability of companies, in part by increasing their liability for making incomplete or inaccurate disclosures.[68] While the Act does not explicitly address environmental disclosures, it significantly heightens the standard for all corporate disclosures.[69] Sarbanes–Oxley mandates "real time" disclosure of any material changes to a company's financial situation and requires companies to "disclose to the public on a rapid and current basis such additional information concerning material changes in the financial condition or operations of the issuer . . . as the Commission determines, by rule, is necessary or useful for the protection of investors and in the public interest."[70]

C. *Why Mandate the Disclosure of Climate Change Information?*

The SEC's release of the 2010 Climate Change Disclosure Guidance reflects the agency's position in a larger debate: While there is broad consensus that mandating the disclosure of certain information promotes market efficiency, encourages competition, and facilitates the formation of capital,[71] the question is whether mandating the disclosure of climate change information is necessarily required in order to achieve

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66. Vail Resorts, Inc., Annual Report (Form 10-K) (Sept. 28, 2017).

67. Id.

68. See Business and Financial Disclosure Required by Regulation S-K, Securities Act Release No. 10,064, Exchange Act Release No. 77,599, 81 Fed. Reg. 23,916, 23,922 (Apr. 22, 2016); Mitchell F. Crusto, Endangered Green Reports: "Cumulative Materiality" in Corporate Environmental Disclosure After Sarbanes–Oxley, 42 Harv. J. on Legis. 483, 500 (2005).

69. See Crusto, supra note 68, at 484–85; see also Larry E. Ribstein, Market vs. Regulatory Responses to Corporate Fraud: A Critique of the Sarbanes–Oxley Act of 2002, 28 J. Corp. L. 1, 3 (2002) ("This Act is the most sweeping federal law concerning corporate governance since the adoption of the initial federal securities laws in 1933 and 1934."). The Act also requires reports of a company's financial statements to be certified by the company's chief executive officer and chief financial officer. The CEO and the CFO must certify that "[e]ach periodic report containing financial statements" that is filed with the SEC "fairly presents, in all material respects, the financial condition and results and operations" of the company. Sarbanes–Oxley Act of 2002, 18 U.S.C. § 1350(a)–(b) (2012). The penalty for certifying false or inaccurate statements includes a fine of up to $5 million and a prison term of up to twenty years. Id. § 1350(c).

70. Sarbanes–Oxley Act of 2002, 15 U.S.C. § 78m (2012).

71. See supra note 46 and accompanying text.

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these objectives. The Earth's changing climate and the resultant shifting landscape of the securities market provide a resounding "yes" as an answer—the growing threat posed by climate change makes it clear that information about climate change is now a critical component of accurately assessing corporate risks and valuation, and thus requiring disclosure of this information rests squarely within the SEC's regulatory mandate.[72] Accordingly, a failure to disclose climate change information may also fall within the ambit of the federal securities fraud laws, which are discussed below.

D. *Fraud in Securities Disclosure*

Section 10(b) of the Exchange Act of 1934[73] and Rule 10b-5,[74] promulgated by the SEC under Section 10(b), are the main antifraud provisions to protect investors from manipulative or deceptive management practices.[75] Section 10(b) makes it unlawful to sell a security registered on a national securities exchange through the use of "any manipulative or deceptive device or contrivance in contravention of such rules and regulations as the Commission may prescribe."[76] In particular, Rule 10b-5 makes it unlawful to "make any untrue statement of a material fact or to omit to state a material fact necessary in order to make the statements made, in the light of the circumstances under which they were made, not misleading."[77] A company's silence regarding information that affects the purchase or sale of securities can constitute fraud provided that there was a duty to disclose such information.[78] The Supreme Court has suggested that Section 10(b) and Rule 10b-5 should be interpreted "flexibly" in order to reach a broad range of potentially fraudulent practices.[79]

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72. See supra Part I (describing the numerous ways in which climate change can impact a company's operations and its value, both positively and negatively); supra notes 22–23 and accompanying text (highlighting the potentially enormous financial impact of climate change on particular sectors of the global economy).

73. 15 U.S.C. § 78j.

74. 17 C.F.R. § 240.10b-5 (2018).

75. Although this Note focuses on Section 10(b) and Rule 10b-5, a securities fraud suit can be based on a number of other laws and provisions as well. See Perry E. Wallace, Climate Change, Fiduciary Duty, and Corporate Disclosure: Are Things Heating Up in the Boardroom?, 26 Va. Envtl. L.J. 293, 314 (2008) (providing a brief overview of antifraud provisions in securities law in addition to Section 10(b) and Rule 10b-5, such as Rule 14a-9 under Section 14(a) of the Securities Exchange Act, which deals with fraudulent representations in proxy solicitations).

76. 15 U.S.C. § 78j(b).

77. 17 C.F.R. § 240.10b-5(b).

78. See Chiarella v. United States, 445 U.S. 222, 230 (1980).

79. SEC v. Capital Gains Research Bureau, Inc., 375 U.S. 180, 195 (1963); see also *Chiarella*, 445 U.S. at 226 ("Section 10(b) was designed as a catchall clause to prevent fraudulent practices."). The lower courts have adhered to this suggestion, with the Second Circuit noting that "[Section] 10(b) and Rule 10b-5 prohibit all fraudulent schemes in

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The 1995 Private Securities Litigation Reform Act (PSLRA) enacted a series of procedural hurdles, such as more onerous pleading requirements, which made it more difficult for prospective plaintiffs to bring securities fraud class actions.[80] The PSLRA requires that a complaint in a securities fraud action "specify each statement alleged to have been misleading, the reason or reasons why the statement is misleading, and, if an allegation regarding the statement or omission is made on information and belief, the complaint shall state with particularity all facts on which that belief is formed."[81]

In addition to fulfilling the PSLRA's heightened pleading standard, a plaintiff bringing a fraud suit under Section 10(b) and Rule 10b-5 has the burden of proving six elements: (1) a material misrepresentation or omission; (2) scienter on the part of the defendant; (3) a connection between the misrepresentation or omission and the purchase or sale of a security; (4) the plaintiff's reliance upon the misrepresentation or omission; (5) economic loss for the plaintiff; and (6) a causal connection between the plaintiff's reliance and economic loss.[82] This Note focuses on the first element—materiality—within the context of securities fraud litigation regarding climate change disclosures.[83]

1. *Materiality in Fraud Suits.* — The concept of materiality lies at the heart of the SEC's disclosure requirements. Apart from statutorily required line-item disclosures, a company is only liable for disclosing *material* information about "those matters to which there is a substantial likelihood that a reasonable investor would attach importance in determining whether

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connection with the purchase or sale of securities," whether the scheme involves a "garden type variety of fraud," or a more unique approach involving "[n]ovel or atypical methods." A.T. Brod & Co. v. Perlow, 375 F.2d 393, 397 (2d Cir. 1967).

80. See Michael A. Perino, Did the Private Securities Litigation Reform Act Work?, 2003 U. Ill. L. Rev. 913, 914, 925.

81. 15 U.S.C. § 78u-4(b)(1).

82. See, e.g., Stoneridge Inv. Partners, LLC v. Scientific-Atlanta, 552 U.S. 148, 157 (2008).

83. While a detailed discussion of all six elements is beyond the scope of this Note, it is important to note that, apart from materiality, several other elements are equally challenging to establish in a securities fraud suit based on the nondisclosure of climate change information. The fourth element of reliance, for example, presents a particular difficulty: Even if a company fails to disclose how climate change can impact its future operations, it is tough for investors to argue that this information was unavailable from other sources. See Richard A. Epstein, Regulatory Enforcement Under New York's Martin Act: From Financial Fraud to Global Warming, 14 N.Y.U. J.L. & Bus. 805, 895 (2018) (noting that, in the context of the NYAG's investigation into Exxon's statements about climate change, "investors could look to independent sources to make their own judgment as to the probability and severity of anticipated government regulation" and "[t]hey need not rely on information provided by ExxonMobil"). A court may thus find that the company's nondisclosure is not actionable because it does not alter the "total mix" of information available to investors. See SEC 2010 Climate Change Disclosure Guidance, supra note 25, at 6292–93.

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to buy or sell the securities registered."[84] In general, courts follow the standard for materiality adopted by the Supreme Court in *TSC Industries v. Northway*: Information, misinformation, or an omission is material if there is a substantial likelihood that it will alter the "total mix" of information available to an investor and take on "actual significance in the deliberations of [a] reasonable shareholder."[85]

The Supreme Court has adopted the *TSC Industries* materiality standard in the context of securities fraud suits.[86] Accordingly, a company is not automatically liable under Section 10(b) and Rule 10b-5 for any and all misrepresentations but rather only for *material* misrepresentations. In fact, a company is potentially not even liable for a material omission, since Section 10(b) and Rule 10b-5 do not create an affirmative duty to disclose material information.[87] As long as there is no affirmative duty to disclose and the information is not necessary "to make the statements made, in the light of the circumstances under which they were made, not misleading," a company may withhold material information without incurring liability.[88]

The Supreme Court has recognized that gauging the materiality of "contingent or speculative" events presents a particular problem for companies when filing disclosure reports, since the impact of such an event on a company's financial profile is necessarily unknown.[89] To evaluate companies' disclosure obligations regarding contingent and speculative events, the Court has developed a probability–magnitude test, under which the materiality of such information depends upon "a balancing of both the indicated probability that the event will occur and the anticipated magnitude of the event in light of the totality of the company activity."[90]

2. *The Materiality of Forward-Looking Information in the MD&A: Known Events or Uncertainties Versus Contingent Forward-Looking Information.* — Information about the projected or anticipated impact of climate change on a company's operations is by definition forward-looking information. Such data are protected by a "safe harbor" provision in the PSLRA that shields companies from liability for certain written or oral forward-looking

84. 17 C.F.R. § 240.12b-2 (2018).

85. TSC Industries, Inc. v. Northway, Inc., 426 U.S. 438, 449 (1976).

86. See Basic Inc. v. Levinson, 485 U.S. 224, 232 (1988) ("We now expressly adopt the *TSC Industries* standard of materiality for the § 10(b) and Rule 10b-5 context.").

87. See id. at 239 n.17 ("Silence, absent a duty to disclose, is not misleading under Rule 10b-5.").

88. 17 C.F.R. § 240.10b-5(b); see also Matrixx Initiatives, Inc. v. Siracusano, 563 U.S. 27, 45 (2011) ("Even with respect to information that a reasonable investor might consider material, companies can control what they have to disclose under these provisions by controlling what they say to the market.").

89. See *Basic*, 485 U.S. at 238.

90. Id. (internal quotation marks omitted) (quoting SEC v. Tex. Gulf Sulphur Co., 401 F.2d 833, 849 (2d Cir. 1968)).

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statements.[91] In general, forward-looking statements are not actionable if they are accompanied by "meaningful cautionary statements identifying important factors that could cause actual results to differ materially from those in the forward-looking statement."[92]

Although all forward-looking information is covered by the PSLRA's safe harbor once it is disclosed,[93] the initial assessment of whether the information must be disclosed under the MD&A depends on whether it is characterized as a known event or uncertainty or more broadly as general forward-looking information. The MD&A only requires disclosure of information about known events or uncertainties; other forward-looking information that is not specifically characterized as such is optional for the company to disclose.[94] The distinction between the two is marked by

91. See Private Securities Litigation Reform Act, 15 U.S.C. § 78u-5(c) (2012). The Act defines a "forward-looking statement" as:

> (A) a statement containing a projection of revenues, income (including income loss), earnings (including earnings loss) per share, capital expenditures, dividends, capital structure, or other financial items;
>
> (B) a statement of the plans and objectives of management for future operations, including plans or objectives relating to the products or services of the issuer;
>
> (C) a statement of future economic performance, including any such statement contained in a discussion and analysis of financial condition by the management or in the results of operations included pursuant to the rules and regulations of the Commission;
>
> (D) any statement of the assumptions underlying or relating to any statement described in subparagraph (A), (B), or (C);
>
> (E) any report issued by an outside reviewer retained by an issuer, to the extent that the report assesses a forward-looking statement made by the issuer; or
>
> (F) a statement containing a projection or estimate of such other items as may be specified by rule or regulation of the Commission.

Id. § 78u-5(h)(i)(1).

For a discussion of some exceptions to the types of entities and forward-looking statements that are covered by the PSLRA's safe harbor, see Ann Morales Olazábal, Safe Harbor for Forward-Looking Statements Under the Private Securities Litigation Reform Act of 1995: What's Safe and What's Not?, 105 Dick. L. Rev. 1, 7–9 (2000).

92. 15 U.S.C. § 78u-5(c)(1)(A)(i). Some courts have held that if fraud liability is to be premised on forward-looking information, the defendant's actual knowledge of the falsity must be proven. See Allan Horwich, Cleaning the Murky Safe Harbor for Forward-Looking Statements: An Inquiry into Whether Actual Knowledge of Falsity Precludes the Meaningful Cautionary Statement Defense, 35 J. Corp. L. 519, 541 & nn.122–23 (2010) (discussing a number of cases that have held that forward-looking statements fall outside the protections of the PSLRA's safe harbor if the defendant made such statements knowing they were false).

93. See SEC Release No. 33-6835, supra note 62, at 22,429.

94. Commission Guidance Regarding Management's Discussion and Analysis of Financial Condition and Results of Operation, Securities Act Release No. 8350, Exchange Act Release No. 48,960, 81 SEC Docket 2905, 2914 (Dec. 19, 2003) [hereinafter SEC Release No. 33-8350]. The use of overlapping terminology in this area often causes confusion around companies' disclosure obligations regarding forward-looking information. Although a company's assessment of whether to disclose known events or uncertainties is governed

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the "nature of the prediction"—information about known events or uncertainties is derived from more concrete "*presently known* data that is *reasonably expected* to have a material impact on future results," but forward-looking information is more contingent and "involves *anticipating* a future trend or event or *anticipating* a less predictable impact of a known event, trend, or uncertainty."[95] Thus, even if the known events or uncertainties are projected to occur in the future, *current* data about *future* known events or uncertainties should be disclosed if such events are "reasonably expected to have a material impact on net sales, revenues, or income from continuing operations."[96]

The SEC has set forth a two-part test for companies to use when evaluating whether known events or uncertainties should be disclosed in the MD&A. Once a company has determined that an event or uncertainty is "known," it must gauge whether it is "likely to come to fruition."[97] If the company can determine that the known event or uncertainty is *not* reasonably likely to occur, then no disclosure is required. If, however, a company cannot determine whether the known event or uncertainty is likely to occur, then it must objectively evaluate the consequences of the known event or uncertainty under the assumption that it *will* come to fruition and disclose those consequences "unless management determines that a material effect on the registrant's financial condition or results of operations is not reasonably likely to occur."[98] Thus, this two-part test creates a presumption in favor of disclosing information about a known event or uncertainty that would have a material effect on the company if the event or uncertainty were to occur, unless the company can definitively demonstrate that such an event is not likely to occur or that the occurrence of such an event would be immaterial. Under current SEC regulations, there is no specified future

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by a separate standard than the assessment of whether to disclose other types of forward-looking information, see id. at 2913–14, a known event or uncertainty is nonetheless forward-looking information. See id. at 2910. Thus, known events or uncertainties are often grouped together with general forward-looking information in contexts that don't require a clear demarcation between the two. See, e.g., CFA Inst., Forward-Looking Information: A Necessary Consideration in the SEC's Review on Disclosure Effectiveness 12 (2014), https://www.cfainstitute.org/-/media/documents/article/position-paper/forward-looking-information-a-necessary-consideration-in-sec-review.ashx [https://perma.cc/6XLU-KY58] (explaining that "a forward-looking statement includes statements containing projections of financial matters, plans, and objectives for future operations or future economic performance (such as statements contained in the issuer's MD&A)").

95. SEC Release No. 33-6711, supra note 61, at 140–41 (emphases added). The SEC has noted that "in identifying, discussing and analyzing known material trends and uncertainties, companies are expected to consider all relevant information, even if that information is not required to be disclosed." SEC Release No. 33-8350, supra note 94, at 2907.

96. SEC Release No. 33-6711, supra note 61, at 140.

97. SEC Release No. 33-6835, supra note 62, at 22,430.

98. Id.

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time period that a company must consider when assessing the impact of a known event or uncertainty.[99] However, a company must address the difficulties associated with establishing a relevant time period if such information would be material.[100]

Courts are split over whether a company's failure to disclose material information in the MD&A is alone sufficient to support a securities fraud suit brought under Section 10(b) and Rule 10b-5,[101] and the Supreme Court has yet to rule on this issue. This split among the courts has resulted in a lack of clarity about the standard used to determine the materiality of forward-looking information in the MD&A for purposes of imposing liability for securities fraud. It is clear that the probability–magnitude test for determining the materiality of forward-looking information as articulated in *Basic Inc. v. Levinson* is distinct from determining the materiality of known events or uncertainties that are part of a company's MD&A disclosure obligations.[102] The Ninth Circuit has rejected the general standard for materiality articulated by the Supreme Court in the context of MD&A disclosures and has held that the adequacy of MD&A disclosures will be evaluated solely in reference to the SEC's two-part test for known events or uncertainties, emphasizing that "what must be disclosed under [the MD&A] is not necessarily required under the [materiality] standard in *Basic*."[103] On the other hand, the Second Circuit has held that if a plaintiff can demonstrate a material misrepresentation or omission regarding forward-looking information in the MD&A and can further demonstrate that the information passes the probability–magnitude test for materiality articulated in *Basic*, the company will be held liable for securities fraud.[104]

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99. See SEC 2010 Climate Change Disclosure Guidance, supra note 25, at 6294; Kuh, supra note 8, at 557.

100. See Davis Polk & Wardwell LLP, Environmental Disclosure in SEC Filings—2010 Update 6 (2010), https://www.davispolk.com/files/files/Publication/548bca7f-7ccb-4f0d-b758-a4aa29d5a1a5/Preview/PublicationAttachment/763baf80-df5c-4022-a39b-a889395f883b/020810_env.pdf [https://perma.cc/7YW5-47XZ].

101. Compare Stratte-McClure v. Morgan Stanley, 776 F.3d 94, 102 (2d Cir. 2015) (holding that "Item 303 imposes the type of duty to speak that can, in appropriate cases, give rise to liability under Section 10(b)" because "a reasonable investor would interpret the absence of an Item 303 disclosure" to mean that there are no known trends or uncertainties to be disclosed), with In re NVIDIA Corp. Secs. Litig., 768 F.3d 1046, 1056 (9th Cir. 2014) (holding that "Item 303 does not create a duty to disclose for purposes of Section 10(b) and Rule 10b-5").

102. See SEC Release No. 33-6835, supra note 62, at 22,430 n.27.

103. *In re NVIDIA*, 768 F.3d at 1055 ("[T]hese two standards differ considerably. Management's duty to disclose under Item 303 is much broader than what is required under the standard pronounced in *Basic*." (citation omitted)).

104. See *Stratte-McClure*, 776 F.3d at 103 ("[A] plaintiff must first allege that the defendant failed to comply with Item 303 . . . . A plaintiff must then allege that the omitted information was material under *Basic's* probability/magnitude test . . . .").

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The conflicting standards for assessing the materiality of climate change information—and the challenges of arguing that climate change information is material under any standard—make it difficult for plaintiffs to succeed in securities fraud suits regarding such forward-looking information. Nonetheless, the following Part suggests that such lawsuits may be brought more frequently in the coming years.

III. The Heightened Potential for Securities Fraud Litigation Based on Corporate Failure to Evaluate and Disclose Climate Change Risks

Two key factors suggest that securities fraud litigation regarding climate change information may become more common in the coming years. First, there are indications—examined in section III.A—that companies are aware of climate change risks that are not being disclosed in their SEC filings.[105] Second, an increasing number of investors are beginning to pay attention to climate change matters and are demanding more accurate and precise disclosures from companies, thus increasing the overall likelihood of future cases similar to *Ramirez*. This phenomenon of the "new" reasonable investor is discussed in section III.B.

Section III.C turns to the *Ramirez* lawsuit filed against Exxon to identify the types of statements and actions that could potentially give rise to securities fraud liability in the context of climate change disclosures.[106] While this section examines the *Ramirez* lawsuit to suggest that similar litigation will face significant challenges under existing legal standards, these challenges do not detract from the factors discussed in sections III.A and III.B and their propensity to increase this type of litigation in the first place.

A. *Corporate Silence in the Face of Climate Change Evidence*

In its 2010 Climate Change Disclosure Guidance, the SEC recognized that because "climate change regulation is a rapidly developing area[,] [r]egistrants need to regularly assess their potential disclosure obligations given new developments."[107] Despite this clear directive from the SEC and

105. An allegation that a company is aware of and failing to disclose climate change risks that can impact the company's value is different from an allegation that a particular company's operations contributed in some way to the effects of climate change, such as a rise in sea levels. This Note is concerned with the former.

106. As mentioned previously, while this Note focuses only on the element of materiality, prospective plaintiffs in securities fraud suits will face difficulty establishing several other elements in order to succeed on their claims. See supra note 83.

107. SEC 2010 Climate Change Disclosure Guidance, supra note 25, at 6296. When assessing their disclosure obligations and "identifying, discussing and analyzing known material trends and uncertainties," companies are required "to consider all relevant information even if that information is not required to be disclosed." Id. at 6295.

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growing calls for improved climate change disclosures from investors,[108] discussions of these matters remain scarce in companies' SEC filings.

1. *The Dearth of Climate Change Information in Corporate Disclosures.* — A 2004 report from the Government Accountability Office noted that "[l]ittle is known about the extent to which companies are disclosing environmental information in their filings with [the] SEC" because "[d]etermining what companies should be disclosing . . . is extremely challenging without having access to company records."[109] Scholars have agreed with this assessment, noting that "[m]uch more analysis is needed on what [climate change] information firms should disclose and how they should disclose it."[110]

Although it is difficult to evaluate how much companies *should* be disclosing, it is clear that many companies are failing to disclose climate change risks in their SEC filings at all. In 2013, more than forty percent of S&P 500 member companies failed to make any mention of climate change in their annual filings with the SEC.[111] This lack of attention to climate change matters has persisted even after the release of the SEC's 2010 Climate Change Disclosure Guidance.[112] The pervasive sentiment among analysts and investors is that the Guidance "has been widely ignored by issuers and the commission alike."[113] The data appear to corroborate this sentiment: A 2017 study of almost 5000 companies worldwide found

108. See infra section III.B (discussing the "new" reasonable investor who is more likely to be attuned to climate change and environmental matters).

109. GAO 2004 Report, supra note 53, at 4, 16.

110. Thomas L. Brewer & Michael Mehling, Transparency of Climate Change Policies, Markets, and Corporate Practices, *in* The Oxford Handbook of Economic and Institutional Transparency 179, 193 (Jens Forssbaeck & Lars Oxelheim eds., 2015).

111. Jim Coburn & Jackie Cook, Ceres, Cool Response: The SEC & Corporate Climate Change Reporting 5, 12 (2014), https://www.ceres.org/sites/default/files/reports/2017-03/Ceres_SECguidance-append_020414_web.pdf [https://perma.cc/C32Z-WCBB]. This number is an improvement over 2008, when more than seventy-five percent of S&P 500 companies failed to discuss climate change in their SEC filings. See Kevin L. Doran & Elias L. Quinn, Climate Change Risk Disclosure: A Sector by Sector Analysis of SEC 10-K Filings from 1995–2008, 34 N.C. J. Int'l L. & Com. Reg. 721, 725–26 (2009). However, "while more companies are saying something about climate change, they are devoting fewer words and being less specific in disclosures filed in 2013 compared with those filed in 2010." Coburn & Cook, supra, at 12; see also Beth Young, Celine Suarez & Kimberly Gladman, Climate Risk Disclosure in SEC Filings: An Analysis of 10-K Reporting by Oil and Gas, Insurance, Coal, Transportation and Electric Power Companies, at iv (2009), https://www.greenbiz.com/sites/default/files/document/Ceres_Climate_Risk_Disclosure_in_SEC_Filings.pdf [https://perma.cc/2D58-RRBV] (evaluating the 2008 SEC filings of "100 global companies in five sectors that have a strong stake in preparing for a low carbon future" and finding "very limited disclosure" of climate change matters, with "fifty-nine companies [making] no mention of . . . their position on climate change").

112. See Benjamin Hulac, Inside the Mirage of Good Climate Info at the SEC, E&E News: Climatewire (Aug. 11, 2016), https://www.eenews.net/climatewire/2016/08/11/stories/1060041464 (on file with the *Columbia Law Review*).

113. Id. (quoting former SEC Commissioner Bevis Longstreth).

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that nearly seventy-five percent of those companies did not discuss climate change risks in their annual financial reports.[114]

Even when companies do mention climate change risks, they often do so in vague boilerplate terms that are unhelpful to investors who seek a serious evaluation of the risks posed by a shifting climate.[115] One likely reason for vague discussions of climate change risks is that the impact of climate change is difficult to quantify in relation to any one particular company's operations.[116] Nonetheless, the SEC has promulgated regulations to guide companies that face challenges in evaluating data about the future with precision or certainty. Per SEC regulations, if the information about future effects is itself material then the company should disclose "the difficulties involved in assessing the effect of the amount and timing of uncertain events, and provide an indication of the time periods in which resolution of the uncertainties is anticipated."[117]

The notion that information about the impact of climate change on a single company's operations is too speculative and thus impossible to disclose in specific terms is also one of the likeliest defenses that a corporation may raise in response to a securities fraud suit.[118] Undoubtedly, it is indeed difficult to evaluate the effects of a changing climate on an individual company's operations or valuation with precision.[119] Nonetheless, as discussed in the following section, corporations may already be alert to

114. Andrea Vittorio, Most Companies' Financial Reports Don't Mention Climate Risks, Bloomberg Law (Oct. 17, 2017), https://www.bna.com/companies-financial-reports-n73014471010/ [https://perma.cc/K7H3-EVU2].

115. See Task Force Report, supra note 23, at 1. For instance, despite recognizing that "[c]lean water is a limited resource in many parts of the world and climate change may increase water scarcity . . . in areas where we maintain brewing operations," Molson Coors Brewing Company's 2015 annual 10-K report to the SEC devotes merely one paragraph to climate change risks, in which the company states simply that "climate change and water availability may negatively affect our business and financial results." Molson Coors Brewing Co., Annual Report 22 (Form 10-K) (Feb. 11, 2016) (emphasis omitted).

116. See infra notes 118–119 and accompanying text.

117. SEC 2010 Climate Change Disclosure Guidance, supra note 25, at 6295. One way for companies to overcome the uncertainty associated with assessing the impact of future events is to engage in scenario analysis. See infra note 165.

118. When asked about the challenges of disclosing climate change information, Katherine Blue, the United States Sustainability Services Leader at the global auditing firm KPMG, stated that "[c]limate change and its impacts are unpredictable, non-linear, and systemic," and that "[m]aking predictions more than five years into the future is effectively speculation." Katherine Blue, Executive Perspective: Lack of Data Creating Growing Risk, Thomson Reuters (Dec. 1, 2017), https://blogs.thomsonreuters.com/sustainability/2017/12/01/executive-perspective-lack-data-creating-growing-risk/ [https://perma.cc/ZSR4-ANCJ].

119. For an extensive discussion of this problem in the context of Canadian securities law (which in many ways parallels the SEC's disclosure regime), see generally Gail E. Henderson, The Materiality of Climate Change and the Role of Voluntary Disclosure (Osgoode Hall Law Sch., Research Paper No. 47, 2009), https://ssrn.com/abstract=1515955 (on file with the *Columbia Law Review*).

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certain climate change risks that are specific and significant enough to merit disclosure.

2. *The Extent of Corporate Awareness of Climate Change Risks.* — Despite the lack of discussion about climate change in registrants' SEC filings, some corporations may be aware of the financial risks of climate change and are either willfully ignoring such risks or failing to evaluate them in a serious manner.[120] A recent analysis of Exxon's climate change communications over the past three decades supports the idea that the company was internally aware that climate change would almost certainly have an adverse impact on its operations and yet attempted to discredit this view among investors by publicly casting doubt on the very existence of climate change.[121]

While Exxon is in the minority in being formally investigated for misleading investors regarding climate change risks, there is evidence that suggests this type of corporate behavior—whether inadvertent or intentional—is much more widespread. A study by the Center for International Environmental Law found that the entire global oil industry, and not just Exxon, was aware of climate change risks as early as the 1980s but deliberately led efforts "to mislead or confuse the public about climate science . . . even as the industry's own scientists were warning them about climate risks."[122]

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120. See Duncan Austin & Amanda Sauer, World Res. Inst., Changing Oil: Emerging Environmental Risks and Shareholder Value in the Oil and Gas Industry 6 (2002), http://pdf.wri.org/changingoil_methodology.pdf [https://perma.cc/D5PA-SPFR] (evaluating and quantifying environmental and climate change risks to companies within the oil and gas industry with precision, which suggests that if companies are conducting similar analyses internally then they are able to predict the risks to their company with relative accuracy, even if not with complete certainty).

121. See Geoffrey Supran & Naomi Oreskes, Assessing ExxonMobil's Climate Change Communications (1977-2014), 12 Envtl. Res. Letters, no. 8, 2017, at 1, 15, https://iopscience.iop.org/article/10.1088/1748-9326/aa815f/pdf (on file with the *Columbia Law Review*). The study examined almost two hundred climate change communications from Exxon, including internal company documents, newspaper advertorials, and academic publications by Exxon's scientists. Id. at 2. The results show that while Exxon's own scientific studies and internal documents acknowledged that climate change impacts and regulation could result in some of the company's fossil fuel assets becoming stranded, Exxon's public representations failed to acknowledge the risk of stranded assets and instead "promot[ed] a narrative inconsistent with the views of most climate scientists" that included "several instances of explicit factual misrepresentation." See id. at 11–13, 15. For instance, Exxon published an advertisement in the *New York Times* in 1997 proclaiming that "[e]ven after two decades of progress, *climatologists are still uncertain how—or even if—the buildup of man-made greenhouse gases is linked to global warming*." Ramirez Consolidated Complaint, supra note 19, at 159.

122. Ctr. for Int'l Envtl. Law, Smoke, Smoke & Fumes, https://www.smokeandfumes.org/smoke (on file with the *Columbia Law Review*) (last visited Jan. 26, 2019). The companies mentioned in the study include Union Oil and Standard Oil of California (both now part of Chevron), Esso (now ExxonMobil), and Shell. See Ctr. for Int'l Envtl. Law, Fumes, Smoke & Fumes, https://www.smokeandfumes.org/fumes/moments/2 (on file with the *Columbia Law Review*) (last visited Jan. 26, 2019).

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Similarly, a report prepared by the Energy and Policy Institute suggests that electric utility companies have been aware of the potential effects of climate change on their industry since the 1980s, but they nonetheless sponsored research to discredit climate science and misled the public regarding their role in the burning and emission of fossil fuels.[123] The report notes that one of its limitations is the inability to access private internal conversations among electric utility officials and "the kind of document disclosure that a serious legal investigation can provide."[124] Assuming that, as the report suggests, these electric companies engaged in affirmative misrepresentations that impacted their financial positions, it seems plausible that this liability could be extended to a charge of securities fraud if evidence of such misrepresentations is uncovered through investigations or litigation. And as the following discussion suggests, such investigations or litigation are poised to become more common in the near future.

B. *A New Reasonable Investor*

An assessment of whether a particular set of facts or information is legally "material" depends critically upon a court's conception of the "reasonable investor" to whom the information would be material. As the Supreme Court has made clear, "materiality depends on the significance the reasonable investor would place on the withheld or misrepresented information."[125]

Recent years have seen a growing interest in the professional generation and sale of environmental information in relation to corporate operations. CDP, a global organization based in the United Kingdom, requests voluntary data from companies, cities, and regions across the globe regarding their environmental activities.[126] The scope of the demand for CDP's work is striking—with offices and partners in over fifty countries, the organization receives requests regarding climate change information from over 800 investors who collectively own $100 trillion in assets

123. David Anderson, Matt Kasper & David Pomerantz, Energy and Policy Inst., Utilities Knew: Documenting Electric Utilities' Early Knowledge and Ongoing Deception on Climate Change from 1968-2017, at 5–6 (2017), https://drive.google.com/file/d/0B8l-rYonMke-NG5ONVZkZVVJMG8/view (on file with the *Columbia Law Review*). The report is the culmination of an independent investigation by the Energy and Policy Institute that examined academic documents, government archives, industry journals, and the work previously done by environmentalists and reporters. Id. at 8. Some of the companies discussed in the report include American Electric Power, Edison Electric Institute, Pacific Gas and Electric Company, Southern Company, and Union Electric Company. Id. at 13.

124. Id. at 8.

125. Basic Inc. v. Levinson, 485 U.S. 224, 240 (1988).

126. See About Us, CDP, https://www.cdp.net/en/info/about-us [https://perma.cc/8XVN-2W5Y] (last visited Jan. 26, 2019). CDP analyzes and organizes this data to issue reports on "critical environmental risks, opportunities and impacts." Id.

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worldwide.[127] Another nonprofit organization, Ceres, operates an Investor Network whose members, among other things, aim to "pressure stock exchanges and capital market regulators to improve climate and sustainability risk disclosure."[128] This Investor Network represents over 160 institutional investors across the world who collectively manage more than $25 trillion in assets.[129]

The existence of organizations such as CDP and Ceres demonstrates that investors are beginning to realize the potential impacts of climate change on corporate financial value and are demanding more accurate and insightful information from companies.[130] Shareholder proposals, which are a helpful gauge of investor sentiment, have increasingly focused on climate change matters and "resolutions calling for greater climate risk disclosure have been gaining traction in recent years."[131] A 2015 report prepared by the Climate Change Support Team of the United Nations Secretary General also acknowledges this trend, noting that institutional investors are increasingly turning to low-carbon opportunities and demanding that policymakers take further actions to address the effects of climate change on the financial sector.[132] As the report states, "While the momentum this creates might not have a large effect on the cost and

127. See id.

128. Ceres Investor Network on Climate Risk and Sustainability, Ceres, https://www.ceres.org/networks/ceres-investor-network [https://perma.cc/LD57-PNUX] (last visited Jan. 26, 2019). One of Ceres's primary goals is to "inspire the most influential investors and companies to integrate environmental, social and governance practices into core business strategies and seize the opportunities embedded in the transition to a low-carbon economy." About Us, Ceres, https://www.ceres.org/about-us [https://perma.cc/RCL9-SU39] (last visited Jan. 26, 2019).

129. Ceres Investor Network on Climate Risk and Sustainability, supra note 128.

130. See, e.g., Ed Crooks, Surge in Corporate Planning for Cost of Carbon, Fin. Times (Oct. 12, 2017), https://www.ft.com/content/33206028-af40-11e7-beba-5521c713abf4 (on file with the *Columbia Law Review*) ("The number of international companies using an internal carbon price in their business planning rose sharply last year as boards and investors pushed managers to assess risks associated with climate change.").

131. Natalie Nowiski, Rising Above the Storm: Climate Risk Disclosure and Its Current and Future Relevance to the Energy Sector, 39 Energy L.J. 1, 35 (2018).

132. See Climate Change Support Team, Trends in Private Sector Climate Finance: Report Prepared by the Climate Change Support Team of the United Nations Secretary-General on the Progress Made Since the 2014 Climate Summit 17 (2015), https://reliefweb.int/sites/reliefweb.int/files/resources/SG-TRENDS-PRIVATE-SECTOR-CLIMATE-FINANCE-AW-HI-RES-WEB1.pdf [https://perma.cc/PY7G-2P82]. For instance, global annual investments in renewable energy projects have grown fifty-five percent between 2009 and 2014. Id. at 19. Responding to similar pressures, Baker Hughes, the world's third-largest oil services provider by market value, has recently pledged to achieve a target of net-zero emissions by 2050 based on heightened interest from its customers in such corporate actions. David Wethe & Alix Steel, Baker Hughes CEO Targets Net-Zero Emissions of Carbon by 2050, Bloomberg Law (Jan. 28, 2019), https://www.bloomberglaw.com/document/X23FVPMG000000 (on file with the *Columbia Law Review*).

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flows of capital in the short run, it is an important signal of long-run investor sentiment and behaviour."[133]

Plainly, "increasingly consistent evidence is amassing to conclude that investors and asset managers deem climate risk information as substantially significant in the decision to buy or sell securities."[134] Since the materiality of any given piece of information is partly assessed in consideration of what a "reasonable" investor would want to know when deciding to purchase or sell securities,[135] this trend suggests that more climate change data may be considered material in the near future. If investors repeatedly express a desire to be informed about climate change information, a court is more likely to find that a reasonable investor considers such information important—material—when making investment decisions.

This shift has relevance beyond the implications associated with establishing the legal definition of a reasonable investor; a growing desire for climate change information means that fraud suits based on inadequate disclosure are more likely simply because investors are more attuned to climate change matters. In fact, the very existence of the *Ramirez* lawsuit is a reflection of the fact that a class of investors is beginning to pay more attention to how climate change can impact the value of their investments.

There is, of course, a strong counterargument that no "reasonable" investor would consider climate change information to be material if the information merely suggests that climate change could potentially (not certainly) impact a company's operations several years down the road.[136] But this argument fails to recognize that, at least for certain industries, climate change is no longer a phenomenon that will only display its effects over the long run. To the contrary, there is ample evidence that climate change is already affecting the financial value of companies today.[137]

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133. Climate Change Support Team, supra note 132, at 17. Investors' increased focus on climate change information could be beneficial to corporate value. Studies have found that companies experience improvements in both short-term and long-term performance following the intervention of activist institutional investors. See Lucian A. Bebchuk, Alon Brav & Wei Jiang, The Long-Term Effects of Hedge Fund Activism, 115 Colum. L. Rev. 1085, 1154–55 (2015); Gillian Tett, Green Investing Generates Returns, Not Just a Warm Glow, Fin. Times (Apr. 19, 2018), https://www.ft.com/content/931b8c88-43aa-11e8-93cf-67ac3a6482fd (on file with the *Columbia Law Review*).

134. Paul A. Griffin & Amy Myers Jaffe, Are Fossil Fuel Firms Informing Investors Well Enough About the Risks of Climate Change?, 36 J. Energy & Nat. Resources L. 381, 401 (2018).

135. See supra text accompanying notes 84–85.

136. See, e.g., Henderson, supra note 119, at 12 (in the context of Canadian securities laws, noting the difficulty in determining whether "a 'reasonable investor' would consider possible physical impacts 50-100 years in the future 'material' today" (footnote omitted)).

137. See supra notes 21–24 and accompanying text.

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C. *The* Ramirez *Litigation*

The pending *Ramirez* class action against Exxon provides a concrete example of the types of claims, defenses, and complexities that can arise in litigation regarding climate change disclosure. The plaintiffs in *Ramirez* are alleging that Exxon deliberately misled investors regarding the impact of climate change on the company's operations and valuation. The 183-page consolidated complaint filed by the plaintiffs conducts a detailed examination of Exxon's filings with the SEC, research reports by securities and financial analysts, Exxon's press releases and media reports, and documents revealed through investigations by state attorneys general.[138]

The complaint alleges in relevant part that Exxon was "aware or recklessly disregarded that [its] representations to investors were materially false and misleading and omitted material information necessary to properly evaluate the Company and its financial condition and prospects."[139] As a result of Exxon's material misstatements and omissions, the complaint claims that the price of Exxon's stock was artificially inflated until the end of October 2016, at which time the company conceded that it might have to write down almost twenty percent of its oil and gas assets based on falling global oil prices due to climate change, information that had been available to the company for years.[140] Exxon's statements in October 2016 caused the price of its stock to drop more than four percent, erasing billions of dollars' worth of market capitalization.[141]

To date, the *Ramirez* lawsuit is one of the only cases in the world to allege securities fraud based on a company's failure to disclose climate change information.[142] The absence of such suits is partly a reflection of

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138. See Ramirez Consolidated Complaint, supra note 19, at 1. Fraud liability under Section 10(b) and Rule 10b-5 is not limited to what a company discloses in its SEC filings; liability under these provisions can be based on *any* public statement or action by a company. See Basic Inc. v. Levinson, 485 U.S. 224, 247 (1988) ("Because most publicly available information is reflected in market price, an investor's reliance on any public material misrepresentations, therefore, may be presumed for purposes of a Rule 10b-5 action.").

139. See Ramirez Consolidated Complaint, supra note 19, at 143.

140. See id. at 8–9. Subsequently, in Exxon's 2017 10-K filing, the company lowered its estimated recoverable reserves by more than three billion barrels. Geoffrey Smith, Exxon's Big Oil Sands Write-Off Could Help It Dodge SEC Troubles, Fortune (Feb. 23, 2017), http://fortune.com/2017/02/23/Exxon-mobil-oil-sands-sec/ [https://perma.cc/8SN4-MVHL].

141. See Ramirez Consolidated Complaint, supra note 19, at 9; Ramirez Initial Complaint, supra note 19, at 3.

142. See U.S. Climate Change Litigation: Securities and Financial Litigation, Sabin Ctr. for Climate Change Law, http://climatecasechart.com/case-category/securities-and-financial-regulation/ [https://perma.cc/TS5J-NGEK] (last visited Jan. 26, 2019) (collecting climate change lawsuits and administrative actions dealing with securities and financial regulation in the United States). In addition to the *Ramirez* lawsuit, one of the first cases alleging securities fraud based on inadequate disclosure of climate change risks was filed against the Commonwealth Bank of Australia in August 2017 in Australian federal court. See Murray Griffin & Chuck McCutcheon, Commonwealth Bank of Australia Shareholders Sue Over Climate Risk, Bloomberg Law (Aug. 8, 2017), https://www.bna.com/commonwealth-

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the difficulty in establishing the elements of a fraud suit in the context of climate change information—for instance, if plaintiffs are unable to adequately allege the materiality of climate change information at the outset, they will be unlikely to even survive a summary judgment motion, let alone succeed on a charge of securities fraud.[143] The pleadings in the *Ramirez* lawsuit exemplify certain limitations of fraud suits that are brought on the basis of inadequate climate change disclosures, including the difficulty in establishing the materiality of climate change information.

1. *Allegations Regarding Exxon's Forward-Looking Statements.* — On October 28, 2016, Exxon issued a press release which cautioned, under a heading titled "Forward-looking Statements," that "[i]f the average prices [of oil] seen during the first nine months of 2016 *persist* for the remainder of the year, under the SEC definition of proved reserves, certain quantities of oil . . . will not qualify as proved reserves at year-end 2016."[144] The complaint alleges that this constitutes a material misstatement in violation of Exxon's MD&A disclosure requirements because the company was aware that certain oil operations would certainly not qualify as proved reserves even if oil prices increased significantly, let alone *persisted.*[145] Despite the fact that Exxon's statement was labeled as a forward-looking statement, the complaint argues that it is not protected by the PSLRA's safe harbor provision because, at the time the statement

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bank-australia-n73014462901/ [https://perma.cc/53MG-MFB7]. The suit was brought by two investors who alleged that the bank was aware, or should have been aware, of climate change risks that may have a material impact on the bank's operations and finances, and which the bank had failed to disclose in its annual reports. Id. Less than two months after it was filed, the plaintiffs withdrew the suit when the bank pledged to conduct climate change scenario analysis and disclose any material risks to its business in its next annual report. See Gareth Hutchens, Commonwealth Bank Shareholders Drop Suit Over Nondisclosure of Climate Risks, Guardian (Sept. 21, 2017), https://www.theguardian.com/australia-news/2017/sep/21/commonwealth-bank-shareholders-drop-suit-over-non-disclosure-of-climate-risks [https://perma.cc/ZG66-C4ZF].

143. See supra notes 82–83 and accompanying text (listing the elements of a securities fraud suit and noting some of the major hurdles prospective plaintiffs face in trying to establish securities fraud regarding the disclosure of climate change information).

144. ExxonMobil Earns $2.7 Billion in Third Quarter of 2016, ExxonMobil (Oct. 28, 2016) (emphasis added), http://news.exxonmobil.com/press-release/exxonmobil-earns-27-billion-third-quarter-2016 [https://perma.cc/L24H-C2C9]. As defined by the SEC, "proved reserves" refer to those oil and gas reserves that are currently owned by a company and "can be estimated with reasonable certainty to be economically producible—from a given date forward, from known reservoirs, and under existing economic conditions, operating methods, and government regulations—prior to the time at which contracts providing the right to operate expire . . . ." Modernization of Oil and Gas Reporting, Securities Act Release No. 33-8995, Exchange Act Release No. 59,192, 94 SEC Docket 3099, 3104 (Dec. 31, 2008). The SEC also provides a method for calculating whether reserves qualify as proved reserves. See id. If a company finds that certain reserves previously classified as proved reserves no longer qualify for the distinction following new calculations, SEC rules require the company to disclose this "de-booking." See Ramirez Consolidated Complaint, supra note 19, at 18, 130.

145. See Ramirez Consolidated Complaint, supra note 19, at 9.

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was made, Exxon *knew* it was false based on pervasive and relatively certain information that the company's operations were being impaired by the long decline in oil prices over 2014 and 2015.[146]

Exxon has responded to this allegation by evading the question of whether these forward-looking statements are protected by the statutory safe harbor. Instead, Exxon emphasized that statements and projections about asset values are "classic examples of opinions" and that the plaintiffs "[have] alleged no particularized facts showing that ExxonMobil did not genuinely hold its 2015 opinions that . . . its assets were not impaired."[147]

Exxon's response is supported by Supreme Court precedent, which has clearly held that "a sincere statement of pure opinion is not an 'untrue statement of material fact,'" and thus it is "not misleading just because external facts show the opinion to be incorrect" even if "an investor can ultimately prove the belief wrong."[148] By avoiding the issue of the safe harbor provision altogether, Exxon's reply demonstrates an additional difficulty in bringing a securities fraud suit on the basis of forward-looking information: Even if a court holds that the statement at issue is not protected under the PSLRA's safe harbor, a company may be able to argue that the statement is simply a nonactionable opinion.

2. *Allegations Regarding Exxon's Use of an Undisclosed, Internal Proxy Cost of Carbon.* — Perhaps the most inflammatory allegation in the *Ramirez* complaint revolves around certain representations made by Exxon in a 2014 report entitled "Energy and Carbon—Managing the Risks," in which Exxon described its use of a "proxy cost of carbon" to calculate the potential effects of government regulations or restrictions on the company's greenhouse gas emissions.[149] The complaint alleges that Exxon's public representations regarding its use of a proxy cost of carbon at $80 per ton in 2040 to calculate future asset value was entirely inconsistent with the

146. See id. at 7–8, 169; see also supra notes 91–93 and accompanying text(discussing the PSLRA's safe harbor for forward-looking statements); supra note 92 (noting that some courts have held forward-looking statements to fall outside the protections of the PSLRA's safe harbor provision if the defendant made the statements with actual knowledge of their falsity).

147. Exxon Motion to Dismiss, supra note 20, at 14. Moreover, as the reply notes, "ExxonMobil's recognition of an impairment as of 2016 does not imply that it should have done so earlier." Id. at 14.

148. Omnicare, Inc. v. Laborers Dist. Council Const. Indus. Pension Fund, 135 S. Ct. 1318, 1327–28 (2015). *Omnicare* was brought under section 11 of the Securities Act of 1933, which grants a right of action to the buyer of a security against the issuer for material misstatements or omissions in registration statements without having to prove scienter on the part of the issuer, thus creating strict liability for material misstatements or omissions (in contrast to Section 10(b) and Rule 10b-5, both of which require the plaintiff to prove scienter). See Yaron Nili, Supreme Court's *Omnicare* Decision Muddies Section 11 Opinion Liability Standards, Harv. L. Sch. F. on Corp. Governance & Fin. Reg. (Mar. 31, 2015), https://corpgov.law.harvard.edu/2015/03/31/supreme-courts-omnicare-decision-muddies-section-11-opinion-liability-standards/ [https://perma.cc/8UJV-ZSVB].

149. See Ramirez Consolidated Complaint, supra note 19, at 2–4.

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company's internal use of an undisclosed lower proxy cost to value its assets.[150]

The reply filed by Exxon dismisses this allegation by simply stating that "ExxonMobil's disclosures never suggested that the Company uses only a single set of figures for all purposes, and the Complaint includes no factual allegations to the contrary."[151] But as the plaintiffs' response to Exxon's motion to dismiss notes, this explanation actually seems to admit the allegation that Exxon deliberately used a different set of numbers to make internal projections from what the company disclosed to the public.[152]

Although this allegation, if true, most likely constitutes securities fraud because it concerns a wholly false representation to the public, this type of allegation is very difficult to prove absent access to internal company documents such as the ones revealed by the New York Attorney General's investigation into Exxon's finances.[153] In the absence of internal records, it is almost impossible to determine whether a lack of climate change disclosures suggests that the company is not facing risks from climate change, whether it has evaluated the risks and deemed them to be immaterial, or whether the company is simply failing to comply with its disclosure obligations.[154] Thus, while this type of allegation may have a good chance of succeeding if it is proven to be true, it is unlikely to form the basis of future securities fraud suits regarding climate change information. Improving the disclosure of climate change information must thereby be accomplished by other means.

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150. See id. at 3–4. Based on documents that were brought to light during the NYAG's investigation into Exxon, the company uses a proxy cost that only reaches $40 per ton by 2030. See id. at 44. The complaint alleges that "Exxon's Corporate Greenhouse Gas Manager acknowledged that the publicly disclosed proxy cost figures were '*more realistic*' than those that Exxon actually used." Id. These representations are alleged to be misleading because they give the false impression that "the Company's assets can and will withstand increasingly stringent future climate change-related policies, as well as climate change-related and consumer-driven market impacts." Id. at 40–41.

151. Exxon Motion to Dismiss, supra note 20, at 11. The reply also notes that "[t]o the extent that plaintiff relies upon the allegation that ExxonMobil should have used hypothetical future carbon costs to estimate proved reserves, its claims should be dismissed for the additional reason that doing so would violate SEC regulations that required ExxonMobil to base those estimates on 'existing,' not future, government regulations." Id. at 12.

152. See Lead Plaintiff's Response in Opposition to Defendants' Motion to Dismiss at 2, 10–11, Ramirez v. Exxon Mobil Corp., 334 F. Supp. 3d 832 (N.D. Tex. 2018) (No. 3:16-cv-3111-K), 2017 WL 5619389.

153. See supra notes 12–15 and accompanying text (providing an overview of the NYAG's investigation into Exxon's finances and accounting practices).

154. See GAO 2004 Report, supra note 53, at 4, 16–17.

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IV. IMPROVING AND INCENTIVIZING CLIMATE CHANGE DISCLOSURE: THE ROLE OF CORPORATIONS AND SHAREHOLDERS

In light of the increasing accuracy and reliability of scientific data,[155] a growing body of evidence pointing to corporate awareness of climate change risks,[156] and the shifting disposition of "reasonable" investors[157]—all of which point to a heightened potential for securities fraud suits based on inadequate disclosure of climate change information—the following discussion approaches the future of climate change disclosures from two angles. First, by focusing on the corporate defendant in a securities fraud suit, section IV.A suggests ways for companies to reevaluate and, if necessary, improve their disclosures of climate change information in order to avoid potential securities fraud charges. Second, by focusing on the investor–plaintiffs who might bring such securities fraud suits, section IV.B considers how they might be able to overcome some of the difficulties associated with establishing the materiality of climate change information.[158]

A. *Improving Corporate Disclosure of Climate Change Information*

One of the best ways to evaluate the adequacy of a company's climate change disclosures is to look at what other similarly situated companies in the same industry are disclosing.[159] For instance, there are clear differences between the 2017 10-K filings of Exxon and Chevron, another multinational energy corporation. Whereas Chevron includes a fairly thorough, albeit

155. See infra notes 178–179 and accompanying text.

156. See supra section III.A.2.

157. See supra section III.B.

158. For a discussion on why and how securities disclosure can be a powerful tool for investors who aim to pressure companies to implement adaptation measures in response to climate change risks, see generally Nina Hart, Sabin Ctr. for Climate Change Law, Columbia Law Sch., Legal Tools for Climate Adaptation Advocacy: Securities Law (2015), http://columbiaclimatelaw.com/files/2016/06/Hart-2015-05-Adaptation-Advocacy-Securities-Law.pdf [https://perma.cc/PV4J-69J7].

159. See GAO 2004 Report, supra note 53, at 18–20 (comparing various studies on the scope and type of information revealed in companies' environmental disclosures). Nevertheless, there are limitations to this approach, including the fact that information that is included in one company's filings but not another's may very well *not* be material for the latter company based on its particular circumstances. See id. at 21 ("[B]ecause disclosure of [greenhouse gas emissions or other potential future risks] . . . is not necessarily required, investors cannot draw conclusions about the lack of such information in a company's SEC filing or compare companies within an industry."). Moreover, if all companies across an industry fail to disclose climate change risks, this approach fails since no one company stands out as a comparator for the rest.

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ambivalent, discussion of climate-related risk factors,[160] Exxon's disclosure on the matter is much more sparse.[161]

In an effort to standardize climate change disclosures across companies within the same industry, the Financial Stability Board's Task Force on Climate-Related Financial Disclosures (the "Task Force") has published a set of recommendations to guide the disclosure of climate change information.[162] These recommendations are a valuable guide for companies looking to improve their climate change assessments and disclosures, and they have "garnered support from governments, financial institutions, accounting boards, insurance companies, [and] pension funds,"[163] as well as from "over 100 companies, whose joint market capitalization totals more than $3.3 trillion, and financial firms responsible for more than $24 trillion in assets."[164]

The Task Force has emphasized the importance of conducting scenario analysis to evaluate potentially disruptive effects of climate change, especially for industries with exposure to fossil fuels and energy-intensive

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160. Under a heading titled "Risk Factors," Chevron noted the following:

> While capital investment reviews and decisions incorporate potential ranges of physical risks such as storm severity and frequency, sea level rise, air and water temperature, precipitation, fresh water access, wind speed, and earthquake severity, among other factors, it is difficult to predict with certainty the timing, frequency or severity of such events, any of which could have a material adverse effect on the company's results of operations or financial condition.

Chevron Corp., Annual Report (Form 10-K) (Feb. 23, 2017). Further, under a section labeled "Forward-looking Information," Chevron noted that severe weather and environmental regulation are among the factors that could cause results to differ materially from those stated in any forward-looking statements in the company's filings. Id.

161. Under the heading "Risk Factors," Exxon noted that "[o]ur operations may be disrupted by severe weather events, natural disasters, human error, and similar events," but the company also reassured investors that its "consideration of changing weather conditions and inclusion of safety factors in design covers the engineering uncertainties that climate change and other events may potentially introduce." ExxonMobil Corp., Annual Report (Form 10-K) (Feb. 22, 2017); see also Tom Sanzillo, Inst. for Energy Econ. & Fin. Analysis, Red Flags on ExxonMobil (XOM): A Note to Institutional Investors 1–2 (2016), http://ieefa.org/wp-content/uploads/2016/10/Red-Flags-on-ExxonMobil-XOM-A-Note-to-Institutional-Investors_October-2016.pdf [https://perma.cc/NQ56-N5GD] (reporting on Exxon's financial profile and its environmental lawsuits to suggest that the company is failing to properly evaluate and disclose the risks associated with climate change).

162. See Task Force Report, supra note 23, at iv. The Financial Stability Board "is an international body that monitors and makes recommendations about the global financial system." About the FSB, Fin. Stability Bd., http://www.fsb.org/about/ [https://perma.cc/DM3Y-ZBDT] (last visited Apr. 20, 2019). The Board has a wide-ranging membership, including institutions such as the Federal Reserve Board, the SEC, the European Central Bank, the International Monetary Fund, and the World Bank. FSB Members, Fin. Stability Bd., http://www.fsb.org/about/fsb-members/ [https://perma.cc/E5W6-LSG6] (last visited Apr. 20, 2019).

163. Nowiski, supra note 131, at 14.

164. Sarah Kent, Companies Pressed to Disclose More on Climate-Change Risk, Wall St. J. (June 28, 2017), https://www.wsj.com/articles/companies-pressed-to-disclose-more-climate-change-risk-1498716002 (on file with the *Columbia Law Review*).

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activities.[165] However, standardizing the use of scenario analysis for disclosure purposes seems difficult since the SEC has not specified any particular future time frame that must be considered when a company is assessing its obligation to disclose forward-looking information, such as an assessment of whether a known trend, event, or uncertainty is "reasonably likely" to occur and thus liable to be disclosed in the MD&A.[166] Leaving the relevant time frame up to a company's own judgment, the SEC has only noted that "the necessary time period will depend on a registrant's particular circumstances and the particular trend, event or uncertainty under consideration."[167]

Although it is unclear exactly what time frame companies *should* be using to conduct strategic planning and risk management for the future, it is clear that the current time frames used by companies are inadequate when considering the risks and opportunities related to climate change. The Task Force reports that most organizations conduct operational and financial planning over a one- to two-year time frame, and strategic planning over a two- to five-year time frame.[168] For organizations such as Exxon and Chevron, such time frames are clearly inadequate when evaluating climate change risks. Using a time frame that extends only a few years into the future fails to take into account important questions whose answers might depend on climate change effects that will become perceptible several years or decades down the line, but which nonetheless might be deemed material to the value of a company today. For instance, if a company's current valuation relies on its plans to extract fossil fuel assets a decade from now, will the company be able to burn the fuel at that time, or could such activities be subject to more onerous regulation in the future? Does oil that won't be burned until

165. See Task Force Report, supra note 23, at 26–27. For specific guidance and recommendations for corporations using scenario analysis to assess climate-related risks and opportunities, which the Task Force recognizes is a "relatively recent" undertaking for most companies (even though "[c]limate-related scenarios have long been used by scientists and policy analysts to assess future vulnerability to climate change"), see Technical Supplement: The Use of Scenario Analysis in Disclosure of Climate-Related Risks and Opportunities, Task Force on Climate-Related Financial Disclosures 1, 12 (2017), https://www.fsb-tcfd.org/wp-content/uploads/2017/06/FINAL-TCFD-Technical-Supplement-062917.pdf [https://perma.cc/8596-GM9F].

166. See SEC 2010 Climate Change Disclosure Guidance, supra note 25, at 6294.

167. Id. at 6294. The Task Force has echoed this view, noting that "the timing of climate-related impacts on organizations will vary . . . [and] specifying time frames across sectors for short, medium, and long term could hinder organizations' consideration of climate-related risks and opportunities specific to their businesses." Task Force Report, supra note 23, at 38.

168. Task Force Report, supra note 23, at 38; see also Greenpeace, Forecasting Failure: Why Investors Should Treat Oil Company Energy Forecasts with Caution 2 (2017), https://secure.greenpeace.org.uk/page/-/ForecastingFailureMarch2017.pdf [https://perma.cc/G74D-ER86] (reporting that energy forecasts from oil companies, such as Exxon and Shell, can be viewed as misleading because they are based upon unlikely assumptions about the future and use metrics that project the future environment will look similar to today).

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2030 have the same projected value as oil expected to be burned in 2020? What about oil that won't be burned until 2040?[169]

The answers to these questions might be material information to a reasonable investor, especially in light of the disclosure required under the MD&A. As discussed above, companies are required to conduct a two-step inquiry in order to determine whether a known event or uncertainty must be disclosed in the MD&A.[170] If Exxon internally engages in this two-step inquiry to evaluate the questions listed above, it is possible that the company might find that the projected value of oil expected to be burned in 2040 is vastly different from the value of oil burned in 2018 due to anticipated climate change regulations or changes in the global demand for oil, information that might be material to a reasonable investor and thus liable to be disclosed.

B. *Enhancing Plaintiffs' Securities Fraud Claims Regarding Climate Change Disclosures*

Investors are increasingly concerned with the long-term planning and risk-management strategies of companies in certain sectors, including the oil, gas, and energy industries, because they recognize that the present value of these companies' assets depends in part on their future outlook and performance.[171] If litigation such as the pending *Ramirez* lawsuit is to be successful in encouraging companies to make disclosures that are useful to investors attuned to climate change risks, the plaintiffs in such lawsuits must consider atypical theories under existing law that could lead a court to find that climate change information is material and thus subject to mandatory disclosure. The discussion below identifies three arguments plaintiffs can advance to strengthen a claim of securities fraud based on the nondisclosure of climate change information: arguing that climate change information has passed the threshold from being general forward-looking information to being a known event or uncertainty, the latter of which a company is statutorily required to disclose; arguing that climate change information, even if it is considered to be general forward-looking information, passes the probability–magnitude test; and arguing that certain climate change events produce "adverse event reports" that must be disclosed.

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169. See also Sanzillo, supra note 161, at 26–30 (suggesting a list of questions investors should ask Exxon regarding the company's exposure to climate change risks, including: (1) whether Exxon accounts for climate change risks in its valuation of proven reserves, and (2) what is the company's definition of "long-term" as it applies to proven and probable reserves).

170. See supra notes 97–98 and accompanying text.

171. See supra section III.B (discussing the changing preferences and priorities of investors and advocating for a shift toward conceptualizing a new "reasonable" investor for purposes of securities fraud litigation).

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1. *Climate Change Information: Known Events or Uncertainties, or Contingent Forward-Looking Information?* — A company's assessment of how its value and operations may be impacted by climate change necessarily involves processing information about the future—such as projections, anticipated risks, and predicted occurrences of future events—which the SEC characterizes as "forward-looking information."[172] For disclosure purposes, the SEC recognizes two types of forward-looking information: known events or uncertainties, and more contingent forward-looking information.[173] As part of its MD&A disclosure obligations, a company is required to disclose material known events or uncertainties, whereas disclosure regarding all other forward-looking information is optional.[174] Despite the significance of this distinction, however, the SEC has failed to articulate a clear rule to demarcate what type of information about the future is considered a known event or uncertainty versus forward-looking information. The best guidance from the Commission regarding these two categories comes in the form of a nebulous explanation: Information about known events or uncertainties is derived from more concrete "*presently known* data that is *reasonably expected* to have a material impact on future results," whereas forward-looking information is more contingent and "involves *anticipating* a future trend or event."[175] These imprecise definitions allow companies a great deal of flexibility in determining which projections or anticipated future events can be characterized as forward-looking if they wish to avoid disclosing that information.

Nonetheless, based on the increasing accuracy of scientific data and predictions, certain forms of climate change information may have crossed the line from being more general forward-looking information to being a known event or uncertainty that must be disclosed. The SEC has noted that the disclosure standard for known events or uncertainties—which are "reasonably expected" or "reasonably likely" to have a material impact in the future—is a lower disclosure standard than "more likely than not."[176] Although it is difficult to quantify this standard, it is clear that a future event or projection does not require a greater than fifty percent probability of occurrence (more likely than not) to qualify as a

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172. See SEC Release No. 33-6711, supra note 61, at 139–40.

173. See supra notes 93–96 and accompanying text (discussing the distinction between these two types of forward-looking information for purposes of disclosure under the securities laws).

174. See supra note 94 and accompanying text.

175. SEC Release No. 33-6711, supra note 61, at 140–41 (emphasis added); see also GAO 2004 Report, supra note 53, at 13. Even though general forward-looking information about the future is more contingent than information about a known event or uncertainty, the former may actually have a greater projected impact on a company's finances and operations. For this reason, characterizing a future event as merely forward-looking information as opposed to a known event or uncertainty is not always sufficient to remove it from the purview of a company's mandatory disclosure obligations.

176. SEC 2010 Climate Change Disclosure Guidance, supra note 25, at 6294 n.54.

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known event or uncertainty under the SEC's definition of the term. Accordingly, the projected impact of future events associated with climate change may need to be disclosed even if such events are more likely to *not* occur, as long as the company determines that the impact—if it occurs—will have a material effect on corporate value.

Several recent studies support the idea that companies are able to predict the future effects of climate change on their operations with a degree of accuracy that would place such information squarely in line with the SEC's formulation of a known event or uncertainty.[177] In addition, some studies have successfully attributed the effects of climate change to the activities of particular companies and industries.[178] Although this latter class of attribution studies is unlikely to figure prominently in a claim of securities fraud because it only helps establish how companies have contributed to climate change and not how climate change has impacted a particular company, the precision of these studies is nonetheless a striking indication of the advances in climate science. The accuracy and specificity of these studies suggest that if companies are conducting internal tests and analyses of climate change risks, they might discover that these risks are now quantifiable such that they cross the threshold from forward-looking information to known events or uncertainties, which must be disclosed in the MD&A. Indeed, the organization Ceres is so convinced of this possibility that it has already pronounced a conclusion to this debate: "The scientific consensus and improved ability for scientists to quantify likely climate change impacts preclude an argument that climate change is not a 'known' trend or uncertainty."[179]

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177. See Battiston et al., supra note 23, at 285 (evaluating the potential exposure of certain large financial companies to the effects of climate change with precision, such as assessing that $200 billion worth of Morgan Stanley's equity holdings are exposed to climate change risks); supra note 11 (discussing Peabody's ability to make specific assessments regarding the company's exposure to climate change risks, such as a projection that the federal government's existing regulations regarding greenhouse gases would reduce the value of Peabody's Southern Powder River Basin coal by thirty-eight percent by the year 2025).

178. See B. Ekwurzel et al., The Rise in Global Atmospheric CO_2, Surface Temperature, and Sea Level from Emissions Traced to Major Carbon Producers, 144 Climatic Change 579, 581, 583, 585 (2017) (finding that emissions traced to ninety major industrial companies account for forty-three percent of the observed rise in carbon dioxide, twenty-nine to thirty-five percent of the rise in global mean surface temperature, and eleven to fourteen percent of global sea level rise since 1980); Richard Heede, Tracing Anthropogenic Carbon Dioxide and Methane Emissions to Fossil Fuel and Cement Producers, 1854-2010, 122 Climatic Change 229, 230, 234 (2014) (conducting a quantitative analysis of fifty leading investor-owned, thirty-one state-owned, and nine nation-state producers of oil, and finding that sixty-three percent of total worldwide emissions of industrial carbon dioxide and methane between 1751 and 2010 could be traced to these particular companies).

179. See Young, Suarez & Gladman, supra note 111, at 9.

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2. *The Materiality of Contingent Forward-Looking Information.* — Even if a court is not as convinced as Ceres that climate change information being a known event or uncertainty is a foregone conclusion, plaintiffs in securities fraud suits may be able to argue that this information should be disclosed under the disclosure standard for more general forward-looking information. To determine a company's disclosure obligations regarding forward-looking information, the Supreme Court has developed a probability–magnitude test under which the materiality of a future event depends "at any given time upon a balancing of both the indicated probability that the event will occur and the anticipated magnitude of the event in light of the totality of the company activity."[180]

The case law in this area does not lend direct support to evaluating climate change information under the "probability" prong, since the vast majority of cases dealing with the probability–magnitude test arise in relation to the question of a company's obligation to disclose merger negotiations. Nonetheless, the resolution of cases in the context of merger negotiations is instructive in evaluating the disclosure of climate change information; both sets of information are characterized as forward-looking and involve projections and predictions about the future.

When determining the materiality of information concerning merger discussions, the Supreme Court has noted that "in order to assess the probability that the event will occur, a factfinder will need to look to indicia of interest in the transaction at the highest corporate levels" and that "board resolutions, instructions to investment bankers, and actual negotiations between principals and their intermediaries may serve as indicia of interest."[181] It is not difficult to see how this statement may be applied in the context of information about climate change; just as a court looks to the "highest corporate levels" to determine the significance of merger negotiations, so can it look to statements made by high-ranking officers within the corporation to determine their knowledge of the potential risks posed by climate change to the company's operations and assets. There is growing evidence that corporations, particularly in certain sectors, are aware of the possible risks that climate change could pose to their financial value, both in the short and long term. As Rex Tillerson, Exxon's former Chief Executive Officer, has stated: "The risks to society and ecosystems from climate change could prove to be significant. So, despite the uncertainties, it is prudent to develop and implement sensible strategies that address these risks."[182] To the extent that statements such as this evince knowledge among a corporation's higher echelons

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180. Basic Inc. v. Levinson, 485 U.S. 224, 238 (1988) (internal quotation marks omitted) (quoting SEC v. Tex. Gulf Sulphur Co., 401 F.2d 833, 849 (2d Cir. 1968)).

181. Id.

182. A Range of Opinions on Climate Change at Exxon Mobil, N.Y. Times (Nov. 6, 2015), https://www.nytimes.com/interactive/2015/11/06/science/exxon-mobil-global-warming-statements-climate-change.html (on file with the *Columbia Law Review*).

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regarding the risks of climate change, they can certainly be used to guide a court's analysis of the "probability" prong.

Although it is unclear how large of a projected impact a future event must have in order to pass the "magnitude" prong, this will likely be a highly contextual and fact-driven inquiry. In one case that used this balancing test to evaluate the materiality of allegedly misleading oral and written predictions about a company's earnings in the upcoming quarter, the Fourth Circuit held that such statements were immaterial because the difference between the predicted income and the actual income accounted for only 0.5% of total revenues.[183] In another case applying the probability–magnitude test, the Second Circuit held that a company's failure to disclose ongoing activities that were likely to lead to serious pollution problems at its manufacturing facilities in China rendered misleading corporate statements describing measures the company was taking to comply with Chinese environmental regulations.[184] The court noted that although the company's statements "warned of a financial risk . . . from environmental violations, the failure to disclose the then-ongoing and serious pollution violations would cause a reasonable investor to make an overly optimistic assessment of the risk."[185] Applying the probability–magnitude test, the court concluded that the company's engagement in activities that were almost certain to lead to serious and ongoing pollution problems was material information that should have been disclosed.[186] In a similar vein, it appears possible for a plaintiff in a securities fraud suit to argue that current ongoing corporate activities that have a strong potential to lead to future problems regarding environmental matters constitute material information that must be disclosed.[187]

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183. See Hillson Partners Ltd. P'ship v. Adage, Inc., 42 F.3d 204, 219 (4th Cir. 1994).

184. See Meyer v. Jinkosolar Holdings Co., 761 F.3d 245, 247 (2d Cir. 2014). The company stated in a prospectus accompanying a public offering that it had, among other things, "installed pollution abatement equipment" at its facilities and that it also "maintain[ed] environmental teams at each of [its] manufacturing facilities to monitor waste treatment and ensure that . . . waste emissions comply with [China's] environmental standards." Id. The company failed to disclose that at the time it made the aforementioned statements, it was engaging in polluting activities which eventually led Chinese regulators to shut down the company's manufacturing facilities, resulting in the company's stock losing forty percent of its value. Id. at 249.

185. Id. at 251.

186. Id. at 252. In another case, the Second Circuit has noted that "[c]autionary words about future risk cannot insulate from liability the failure to disclose that the risk has transpired." Rombach v. Chang, 355 F.3d 164, 173 (2d Cir. 2004).

187. The complaint in the *Ramirez* lawsuit makes a comparable yet slightly different argument by alleging that Exxon's internally generated reports concerning climate change recognized that the company's current activities would be unsustainable in the future, potentially leading to a large and material portion of Exxon's reserves becoming stranded. See Ramirez Consolidated Complaint, supra note 19, at 1–2. This argument could potentially be reframed to allege that Exxon's internal knowledge of certain forward-looking information associated with climate change was "probable" and "certain" enough to pass the probability–magnitude test.

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3. *The Materiality of Adverse Event Reports and Integrated Assessment Models.* — Adverse event reports, which are traditionally associated with the medical and pharmaceutical industries and are reported to the Food and Drug Administration, are reports of any unfavorable or unintended consequences associated with the use of a product or device.[188] The Supreme Court has spoken to the materiality of adverse event reports in *Matrixx Initiatives, Inc. v. Siracusano*, a case alleging securities fraud.[189] Although *Matrixx* addressed the disclosure of adverse event reports specifically in the context of the pharmaceutical industry, the decision may have important implications for determining the materiality of "reports" about a company's susceptibility to the negative effects of climate change, which might come in the form of results generated by integrated assessment models (IAMs).[190]

In *Matrixx*, the Court considered whether Matrixx, a pharmaceutical company, had committed securities fraud by issuing press releases that denounced any connection between a drug manufactured by the company and anosmia (loss of the sense of smell), despite Matrixx's alleged internal knowledge of reports about such health risks that "indicat[ed] a significant risk to its leading revenue-generating product."[191] The Court held that assessing the materiality of adverse event reports is a highly fact-specific inquiry dependent upon the source, content, and context of the reports.[192] Importantly, the Court did not automatically deem the adverse event reports to be immaterial despite the fact that the reports did *not* contain a statistically significant link between the drug and the adverse events in question.[193] Instead, the Court emphasized that "Matrixx had evidence of a biological link between [its product's] key ingredient and anosmia, and *it had not conducted any studies of its own to disprove that link*."[194] Even though Matrixx explained that the scientific evidence at the time was too weak to allow for meaningful study of this supposed link, the

188. See Questions and Answers on FDA's Adverse Event Reporting System (FAERS), FDA, https://www.fda.gov/Drugs/GuidanceComplianceRegulatoryInformation/Surveillance/AdverseDrugEffects/default.htm [https://perma.cc/2FUL-JK8Y] (last visited Jan. 26, 2019).

189. 563 U.S. 27 (2011).

190. In a different but related context, one commentator has noted that *Matrixx* could impact the determination of materiality for "green slogans and affirmations that companies make about their reputations and practices," such as "British Petroleum's television and print advertisements professing that it is a 'global leader' in clean energy production and Walmart's public relation announcement proclaiming that it is an environmental leader." Cadesby B. Cooper, Note, Rule 10b-5 at the Intersection of Greenwash and Green Investment: The Problem of Economic Loss, 42 B.C. Envtl. Aff. L. Rev. 405, 424 (2015).

191. *Matrixx*, 563 U.S. at 34–35.

192. See id. at 43.

193. See id.

194. Id. at 47 (emphasis added).

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Court found that this information itself was material and required to be disclosed.[195]

Matrixx may have implications for how courts assess climate change information if a plaintiff were to bring a similar fraud suit regarding the nondisclosure of "adverse event reports" in the context of climate change. Such adverse event reports could be scientific studies themselves, such as the ones discussed above,[196] even if these studies do not definitively prove a significant link between the company's activities and climate change risks. More specifically, "adverse event reports" in the context of climate change might be the results and models produced by IAMs.

Broadly, IAMs represent an approach to modeling future scenarios that "integrate[s] knowledge from two or more domains into a single framework."[197] Whereas climate models are based solely upon scientific data about the Earth's climate,[198] IAMs rely on a much wider range of inputs, including social, economic, and historical data.[199] Due to their holistic nature, IAMs can conduct a more thorough analysis of the future and thereby provide answers to remarkably narrow questions about climate change, such as: "What if countries impose a universal price of $100 per

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195. Id.

196. See supra notes 178–179. In addition to quantifying the risks posed by climate change to a particular company and determining the extent to which climate change impacts are attributable to a particular company's activities, some studies are also attempting to determine the extent to which extreme weather events are exacerbated by climate change. See Kerry Emanuel, Assessing the Present and Future Probability of Hurricane Harvey's Rainfall, 114 Proc. Nat'l Acad. Sci. U.S. 12,681, 12,681 (2017), http://www.pnas.org/content/114/48/12681.full.pdf [https://perma.cc/WF8F-N6UJ] (finding that climate change increased the annual probability of a storm as destructive as Harvey affecting Texas by six percent as compared to the late twentieth century, and that the annual probability of such a storm will further increase by eighteen percent between the years 2081 and 2100); Geert Jan van Oldenborgh et al., Attribution of Extreme Rainfall from Hurricane Harvey, August 2017, 12 Envtl. Res. Letters, no. 12, 2018, at 1, 9, http://iopscience.iop.org/article/10.1088/1748-9326/aa9ef2/pdf (on file with the *Columbia Law Review*) (finding that climate change made the precipitation from Hurricane Harvey about fifteen percent more intense and the storm itself about three times more likely). By making it easier to determine whether and how extreme weather events are expected to worsen in the future, such studies lend further support to plaintiffs who allege that companies should be able to predict the effects of climate change on their operations with accuracy. Cf. Ctr. for Int'l Envtl. Law, Smoke and Fumes: The Legal and Evidentiary Basis for Holding Big Oil Accountable for the Climate Crisis 22 (2017), http://www.ciel.org/wp-content/uploads/2017/11/Smoke-Fumes-FINAL.pdf [https://perma.cc/B72C-B99F] (describing how oil companies considered potential climate impacts in their long-term plans).

197. William Nordhaus, Integrated Economic and Climate Modeling, *in* Handbook of Computable General Equilibrium Modeling 1069, 1070 (Peter B. Dixon & Dale W. Jorgenson eds., 2013).

198. Q&A: How Do Climate Models Work?, CarbonBrief (Jan. 15, 2018), https://www.carbonbrief.org/qa-how-do-climate-models-work [https://perma.cc/3MFD-PQAP].

199. Q&A: How "Integrated Assessment Models" Are Used to Study Climate Change, CarbonBrief (Oct 2, 2018), https://www.carbonbrief.org/qa-how-integrated-assessment-models-are-used-to-study-climate-change [https://perma.cc/9MH7-KSNM].

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tonne of CO2 emissions by 2020?"[200] The answers to such questions are precisely the type of climate change information that may form the basis of a securities fraud suit if companies either (1) conduct such assessments and fail to disclose their results and data, or (2) fail to conduct assessments that demonstrate the company's *lack* of vulnerability to climate change. Certain companies, at least, indisputably have access to the type of data that can be used to generate IAMs.[201] And as the Court held in *Matrixx*, as long as a company has access to reports containing data that, if true, may be harmful to the company's value—which can include data about the effects of climate change—the company cannot escape securities fraud liability by simply refusing to conduct studies to definitively prove or disprove that data.[202]

The *Matrixx* Court also emphasized that lack of statistical significance was not dispositive evidence of immateriality. While it is possible that, in many cases, reasonable investors will not deem adverse event reports (or adverse IAM reports) to be material information, it is also possible that "in some cases . . . reasonable investors would have viewed reports of adverse events as material even though the reports did not provide statistically significant evidence of a causal link."[203] In fact, the *Matrixx* Court recognized that "[s]tatistically significant data are not always available" and that experts "rely on other evidence to establish an inference of causation."[204] As one scholar has noted in relation to the decision in *Matrixx*: "When the costs of nondisclosure are potentially great, the omission of scientific findings is more likely to be misleading and material even when these findings have not been confirmed by customary scientific processes."[205]

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200. Id.

201. A number of banks, such as J.P. Morgan, have recently started conducting "environmental stress tests" that "look[ ] at how certain environmental risks, such as carbon emissions and a lower demand for oil, would affect a specific customer portfolio, including the probability of default and loss." Steve Marlin, Banks Begin to Model Climate Risk in Loan Portfolios, Risk.net (Jan. 16, 2018), https://www.risk.net/risk-management/5380376/banks-begin-to-model-climate-risk-in-loan-portfolios [https://perma.cc/95BH-HLLF]; see also Griffin & Jaffe, supra note 134, at 383 (noting that companies are "show[ing] increased willingness to respond to investors' concerns about the potentially harmful impacts of their activities by publishing stress-test results using integrated assessment models").

202. See Matrixx Initiatives, Inc. v. Siracusano, 563 U.S. 27, 47 (2011).

203. Id. at 44. In order for adverse event reports to satisfy the materiality standard set forth in *TSC Industries*, "something more" beyond the mere existence of adverse event reports is needed. Id. This "something more" can be derived from the "source, content, and context of the reports." Id. (internal quotation marks omitted).

204. *Matrixx*, 563 U.S. at 40.

205. Shannon M. Roesler, Evaluating Corporate Speech About Science, 106 Geo. L.J. 447, 493 (2018).

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CONCLUSION

Mark Carney, an economist and former chairman of the Financial Stability Board, has termed climate change a "tragedy of the horizon."[206] Carney's characterization speaks to a key concern regarding the disclosure of climate change risks—since corporations generally conduct risk analyses based on a shorter time frame to enhance accuracy, investors are unable to assess the long-term effects of climate change on corporate value until "it may already be too late"[207] to recoup their investments. This notion is no longer merely an academic cry for caution. Indeed, "Mark Carney's fear of a tragedy of the horizon has a solid empirical basis,"[208] one that is growing stronger with each passing day that corporations around the world fail to address the serious threats posed by climate change.

206. Mark Carney, Governor of the Bank of Eng., Breaking the Tragedy of the Horizon—Climate Change and Financial Stability, Speech at Lloyd's of London 3–4 (Sept. 29, 2015), https://www.bankofengland.co.uk/-/media/boe/files/speech/2015/breaking-the-tragedy-of-the-horizon-climate-change-and-financial-stability.pdf [https://perma.cc/6XP7-F3NH].

207. Id.

208. Allie Goldstein, Will R. Turner, Jillian Gladstone & David G. Hole, The Private Sector's Climate Change Risk and Adaptation Blindspots, 9 Nature Climate Change 18, 23 (2019).

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