Making Climate Pledges Stick: A Private Ordering Mechanism for Climate Commitments

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Corporate climate commitments are an important part of the global response to climate change, but critics have warned that many of these pledges constitute greenwashing—empty commitments whose credibility is difficult to assess at best. Government regulators in the European Union and the United States have taken initial steps to regulate corporate climate behavior and disclosure but have demonstrated little appetite for robust regulation of corporate climate pledges. The current regulatory framework's weakness means there is little confidence that companies will fulfill their pledges. This Article responds to this regulatory challenge by developing two novel financial instruments that would enable companies to make credible commitments by entering into binding contracts with third parties. The two instruments, which we term a carbon letter of credit and a climate pledge green bond, create a mechanism that binds the company far into the future and ensures that its past commitment will be executed. By providing a reliable mechanism that allows companies to issue a binding climate pledge, we enable climate leaders to credibly distinguish themselves from greenwashers, facilitating the emergence of a separating equilibrium. Public and private regulators can insist that corporations use these instruments, and corporations can use them to support their reputation and gain access to green finance. Our focus is on corporate climate commitments, but organizations can also use the instruments we propose to back commitments on a wide range of topics beyond climate change.

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INTRODUCTION

This Article proposes two new financial instruments that address a core climate and corporate governance concern by enabling companies to make binding climate commitments. Corporate climate commitments, often in the form of pledges to achieve "net zero" emissions by 2030 or 2050, are an important part of the global response to climate change. For example, Nestle has committed to halving its greenhouse gas (GHG) emissions by 2030 and to achieving net zero by 2050; Nike has committed to reducing its Scope 1 & 2 (corporate) emissions by 65 percent by 2030, its Scope 3 (supply chain) emissions by 30 percent by 2030, and reaching net zero by 2050; and Vodafone has committed to reducing its carbon emissions to net zero by 2030 and across the full value chain by 2040.[1]

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1. NESTLE, NESTLE'S NET ZERO ROADMAP 3 (2023), https://www.nestle.com/sites/default/files/2024-02/creating-shared-value-sustainability-report-2023-en.pdf); NIKE, BREAKING BARRIERS: FY21 NIKE INC. IMPACT REPORT 85 (2022), https://about.nike.com/en/impact-resources/fy21-nike-inc-impact-report-2); VODAFONE GROUP PLC,

These are not just isolated commitments. Climate pledges are common across many of the most carbon-intensive sectors. If implemented, they will result in roughly 3.2 to 4.2 billion tons of annual emissions reductions by 2030.[2] This reduction would be more than the annual emissions of India, the third-highest emitting country, and the corporate climate commitments for 2050 are much larger.[3] These commitments also played a leading role in the most recent Conference of the Parties for the U.N. Framework Convention on Climate Change ("COP27"),[4] with advocates arguing that these commitments can complement government measures and enhance the likelihood of achieving international climate goals.[5]

But as corporate climate pledges have become more important, critics have warned that many of these pledges constitute greenwashing—empty commitments whose credibility is difficult to assess at best.[6] Greenwashing concerns dominated much of the discourse at COP27,[7] and critics have focused

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ANNUAL REPORT 2022 41 (2022), https://investors.vodafone.com/sites/vodafone-ir/files/2022-05/vodafone-2022-annual-report.pdf. For further analysis of this trend *see* ACCENTURE, ACCELERATING GLOBAL COMPANIES TOWARD NET ZERO BY 2050 (2023) https://www.accenture.com/content/dam/accenture/final/capabilities/strategy-and-consulting/strategy/document/Accenture-Net-Zero-By-2050-Global-Report-2022.pdf.

2. Lois Guthrie & Luke Blower, *Corporate Climate Disclosure Schemes in G20 Countries After Cop 21,* ORG. FOR ECON. COOP. & DEV 15, https://www.oecd.org/environment/cc/g20-climate/collapsecontents/Climate-Disclosure-Standards-Board-climate-disclosure.pdf (last visited Dec. 28, 2023). For data on corporate climate commitments, see *Carbon Removal Corporate Action Tracker*, INST. FOR CARBON REMOVAL L. & POL'Y, https://docs.google.com/spreadsheets/d/1vf—uXsf6fo7MuNpPya2Kz82Dxte0hHgtOXimgpRA3c/edit#gid=0. (last visited Dec. 28, 2023).

3. *Climate Action Note: Data You Need to Know*, U.N. ENV'T PROGRAMME (UNEP) (Nov. 9, 2021), https://www.unep.org/explore-topics/climate-action/what-we-do/climate-action-note/state-of-climate.html?gclid=Cj0KCQjw4s-kBhDqARIsAN-ipH0RvEgYH-4PS7TPr0gdIw9MF3J2hG0KnCyFlYNqb8TSX3cSusUomXsaAr2_EALw_wcB (last visited Jun 22, 2023); *see* INST. FOR CARBON REMOVAL L. & POL'Y, *supra* note 2.

4. U.N. HIGH-LEVEL EXPERT GROUP ON THE NET ZERO EMISSIONS COMMITMENTS OF NON-STATE ENTITIES, INTEGRITY MATTERS: NET ZERO COMMITMENTS BY BUSINESSES, FINANCIAL INSTITUTIONS, CITIES AND REGIONS 7, 39 (2022), https://www.un.org/sites/un2.un.org/files/high-level_expert_group_n7b.pdf [hereinafter EXPERT REPORT] ("Our report also specifically addresses the core concerns raised by citizens, consumers, environmentalists and investors around the use of net zero pledges that make greenwashing possible.").

5. António Guterres, *Secretary-General's Remarks at Launch of Report of High-Level Expert Group on Net-Zero Commitments,* U.N. (Nov. 8, 2022), https://www.un.org/sg/en/content/sg/statement/2022-11-08/secretary-generals-remarks-launch-of-report-of-high-level-expert-group-net-zero-commitments-delivered ("A growing number of governments and non-state actors are pledging to be carbon-free – and obviously that's good news.").

6. *See* Amanda Shanor & Sarah A. Light, *Greenwashing and the First Amendment*, 122 COLUM. L. REV. 2033, 2043-45 (2022) (defining categories of greenwashing); *see also* Amy D. Roy et al., *Litigation Risks Posed by 'Greenwashing' Claims for ESG Funds*, HARVARD L. SCH. F. ON CORP. GOVERNANCE (Apr. 25, 2022), https://corpgov.law.harvard.edu/2022/04/25/litigation-risks-posed-by-greenwashing-claims-for-esg-funds/ (stating that greenwashing consists of misleading claims made by corporations "about the climate-friendliness of their operations or the products they manufacture"); Sebastiao Vieira de Feitas Netto, Marcos Felipe Falcao Sobral, Ana Regina Bezerra Ribiero & Gleibson Robert da Luz Soares, *Concepts and Forms of Greenwashing: A Systemic Review,* 32 ENVIRO. SCIENCES EUR. 19, 2 (2020) (cataloging various definitions of greenwashing); *see generally* Soh Young In & Kim Schumacher, *Carbonwashing: ESG Data Greenwashing in a Post-Paris World* in SETTLING CLIMATE ACCOUNTS: NAVIGATING THE ROAD TO NET ZERO (Thomas Heller & Alicia Seiger, eds., 2021).

7. *See*, *e.g.*, Guterres, *supra* note 5 ("The problem is that the criteria and benchmarks for these net-zero commitments have varying levels of rigor and loopholes wide enough to drive a diesel truck through. We must have zero tolerance for net-zero greenwashing.").

on four core concerns about climate pledges. The first concern is a problem of adequacy: even if achieved, many commitments are too modest to make a significant contribution to global climate goals, either because they exclude major types of emissions, set targets that are too low, rely on low-quality offsets that may not actually reduce emissions, or are not transparent. For instance, Shelly Welton has noted that net zero commitments are often too narrow and that the carbon offsets many commitments rely on are inadequate or fail to account for social and economic justice.[8] Advocacy groups and academic studies also have questioned whether companies are on track to meet their climate commitments.[9] A 2021 study by the New Climate Institute concluded that the commitments of twenty-five major global firms, even if fulfilled, were likely to reduce their emissions by only 40 percent rather than the claimed 100 percent.[10]

The second core concern is a problem of enforcement: corporations face limited risks for failing to fulfill their climate commitments. Government regulators in the European Union (E.U.) and the United States (U.S.) Securities and Exchange Commission (SEC) have taken initial steps to regulate corporate statements about their climate commitments.[11] For instance, the E.U. has adopted a pro-climate legislative package that includes a new directive on Corporate Sustainability Reporting (CSRD) that will expand and strengthen the requirements for sustainability disclosure.[12] In the U.S., the SEC has adopted new climate disclosure regulations and announced new enforcement guidance regarding corporate environmental, social, and governance (ESG) disclosures.[13] Pressure to comply with commitments may arise not only from government and private securities law actions, but also from federal and state consumer protection laws and tort litigation risks. In addition, several major private governance systems have emerged,[14] and the United Nations has created voluntary programs to increase the quality of corporate climate commitments.[15] Yet these public and

8. *See* Shelley Welton, *Neutralizing the Atmosphere*, 132 YALE L.J. 171, 174-77 (2022). *See generally* Daniel C. Esty and Nathan de Arriba-Sellier, *Zeroing in on Net-Zero: From Soft Law to Hard Law in Corporate Climate Pledges*, 94 U. COLO. L. REV. 635 (2023) (reviewing growth of corporate net zero pledges and concerns about whether they will be fulfilled).

9. THOMAS DAY ET AL., CORPORATE CLIMATE RESPONSIBILITY MONITOR 2022: ASSESSING THE TRANSPARENCY AND INTEGRITY OF COMPANIES' EMISSION REDUCTION AND NET-ZERO TARGETS 5 (Feb. 2022), https://newclimate.org/sites/default/files/2022-06/CorporateClimateResponsibilityMonitor2022.pdf [hereinafter "CCR REPORT"]; JESSE BRAGG ET AL., THE BIG CON: HOW BIG POLLUTERS ARE ADVANCING A "NET ZERO" CLIMATE AGENDA TO DELAY, DECEIVE, AND DENY 8 (2021), https://www.corporateaccountability.org/wp-content/uploads/2021/06/The-Big-Con_EN.pdf (arguing that "polluting corporations and governments are advancing 'net zero' plans that require little or nothing in the way of real solutions or real effective emissions cuts").

10. CCR REPORT, *supra* note 9, at 5.

11. *See* Albert C. Lin, *Making Net Zero Matte*r, 79 WASH. & LEE L. REV. 679, 714-16, 720-22 (2021) (reviewing public and private governance mechanisms for regulating pledges and proposing reforms). *See generally* Virginia Harper Ho, *Modernizing ESG Disclosure*, 2022 U. ILL. L. REV. 277 (providing overview of ESG disclosure standards and recommending reforms).

12. *See* discussion *infra* Part II.C.1.a.

13. *See* discussion *infra* Part II.C.1.b.

14. *See* discussion *infra* Part II.C.2.

15. *See* Angel Hsu, *NAZCA: Track Climate Pledges of Cities and Companies*, 532 NATURE 303, 303 (2016).

private governance initiatives have failed to establish a robust enforcement framework for corporate climate commitments,[16] and substantial doubts have arisen about the credibility of these commitments.[17]

The third core concern is the most difficult: the problem of time. How can a company make a credible climate commitment today when the target of that commitment lies far into the future (e.g., 2030, 2040, or 2050)?[18] Contemporary climate pledge practice allows firms to reap reputational benefits ex ante by frontloading the benefits of their anticipated future climate actions without facing appropriate penalties ex post if they fail to fulfill their promises (and incur the associated mitigation costs).[19] The temporal problem is closely linked to the enforcement problem because a climate commitment's credibility depends on a mechanism that credibly binds the organization in the future to comply with its past commitment.[20] Because long-term pledges are generally beyond the accountability horizon of corporate executives, the challenge is to develop a mechanism that can remain effective for several generations of corporate leadership.[21]

The fourth concern is that private sector action will undermine government action. Shelley Welton has emphasized this risk.[22] Meanwhile, Dorothy Lund has celebrated the growth of green finance and the emergence of "prosocial financial instruments,"[23] presumably based on the assumption that these

16. *See* CONFERENCE OF PARTIES, SHARM EL-SHEIKH IMPLEMENTATION PLAN: ADVANCE UNEDITED VERSION 10, https://unfccc.int/sites/default/files/resource/cop27_auv_2_cover%20decision.pdf (last visited Jan. 6, 2022) [hereinafter COP27 PLAN]. The plan makes two non-committing references to the issue of corporate accountability. *Id.* at ¶ 61 ("*Welcomes* the recommendations of the High-Level Expert Group on the Net-Zero Emissions Commitments of Non-State Entities, launched by the U.N. Secretary-General in March 2022") (emphasis in original); *Id.* at ¶ 62 ("*Invites* the secretariat to ensure greater accountability of voluntary initiatives through the Non-State Actor Zone for Climate Action platform [https://climateaction.unfccc.int]") (emphasis in original).

17. CCR REPORT, *supra* note 9, at 5.

18. *See, e.g.*, Dorothy Lund, *Corporate Finance for Social Good*, 121 COLUM. L. REV. 1617, 1620-21 (2021) (noting that "fiduciaries, however, lack incentives to make public interested choices that are *bad* for business, or that might not pay off for many years" (emphasis in original). As Albert Lin has asked, "The fact that many net zero targets are decades away raises further doubts: in the year 2050, will anyone notice or sanction an entity's failure to achieve a target set in 2022? Net zero targets might represent no more than empty promises that help companies deflect criticism and forestall regulation." *See* Lin, *supra* note 11 at 707.

19. *See, e.g.*, Joshua Ulan Galperin, *Environmental Governance at the Edge of Democracy*, 39 VA. ENV'T L.J. 70, 89-97 (2021) (noting the vulnerabilities of commitments enforced through private governance pressure).

20. A common assumption about net zero commitments is that they are legally unenforceable. *See* Lin, *supra* note 11, at 698 ("Though these commitments are voluntary and legally unenforceable, their achievement could make a sizeable contribution to addressing climate change."). As Lin has noted, "identifying mechanisms to hold actors accountable for their pledges will be essential." *Id.* at 702.

21. Caroline Flammer et al., *Corporate Governance and The Rise of Integrating Corporate Social Responsibility Criteria in Executive Compensation: Effectiveness and Implications for Firm Outcomes*, 40 STRATEGIC MGMT. J. 1097, 1101 (2019) (noting that "absent proper incentives—managerial short-termism is likely to prevent managers from undertaking long-term investments in stakeholder initiatives that contribute to long-term value creation").

22. *See* Welton, *supra* note 8, at 177 (raising concern that "disjunctive efforts toward net zero pose real risks for the critical global imperative of atmospheric neutralization. . . .Under [the Paris Agreement's] legal order, a private marketplace might displace country-centered ambition, ultimately proving counterproductive to sustained global progress."); CCR Report, *supra* note 9, at 4.

23. Lund, *supra* note 18, at 1621.

instruments will not erode support for preferable government action. Although on the surface, Welton and Lund appear to have different assumptions about the net effects of private sector action, we view these perspectives as compatible if the credible commitment problem can be solved. In other words, if new private instruments can yield highly credible climate commitments, there is little risk of undermining more effective government climate action. We thus share both Welton's concerns about undermining support for government climate action and Lund's implicit optimism about the role of new climate-focused financial instruments: that well-designed private financial instruments can complement rather than undermine government climate actions.

This Article draws on the private ordering literature to develop two new financial instruments that would enable firms to make credible and binding climate commitments.[24] We propose two instruments that create non-revocable carbon future commitments: a carbon letter of credit (CarbonLC) and a climate pledge green bond (CPGB). These private instruments would create a costly signaling mechanism that would enable true climate leaders to distinguish themselves from greenwashers, leading to a separating equilibrium. Further, these new instruments will provide a way to hold corporations accountable for their public statements, thus responding to an important critique of climate justice activists and scholars regarding corporate climate action.[25]

Two theoretical questions are important to our proposal. First, why would some corporations be motivated to bear the extra costs of making a climate commitment credible? We argue that the explanation lies in the idea of costly signaling developed independently by economist Michael Spence and biologist Amotz Zahavi. Companies with a truly sustainable culture can use these instruments to clearly distinguish themselves from less committed companies, reaping reputational benefits and better access to green finance. Costly signaling thus enables the emergence of a separating equilibrium between "true greens" and greenwashers. By facilitating a separating equilibrium, our instruments can serve as a "discovery tool" that will enable investors and businesses with aligned interests to find each other, increasing the pool of funds available for climate-committed firms.[26]

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24. Other authors have noted that the growth in the development of "prosocial financial instruments" has "exploded in the past five years," and have identified the gap between firms' promises and actual performance. Lund, *supra* note 18, at 1621; *see* Welton, *supra* note 8, at 196. However, this is the first Article to offer viable instruments through which corporations will be able to credibly commit ex-ante to close this gap.

25. *See* Welton, *supra* note 8, at 223-27. By making corporations accountable to their carbon pledges, our proposed instruments respond both to concerns regarding distributive justice (e.g., who should take financial responsibility for reducing emissions?) and regarding intergenerational justice (how should the burden of climate mitigation be divided between current and future generations?). Our proposal does not provide a solution to the dilemma of compensatory justice, which explores the responsibility of big corporations to victims of climate change. *See, e.g.*, Anita Forester, *Climate Justice and Corporations*, 30 KING'S L.J. 305, 307 (2019) (discussing compensatory justice issues).

26. ORG. FOR ECON. COOP. & DEV, GREEN BONDS: MOBILISING THE DEBT CAPITAL MARKETS FOR A LOW-CARBON TRANSITION 32 (2015), https://www.oecd.org/env/mobilising-bond-markets-for-a-low-carbon-transition-9789264272323-en.htm [hereinafter OECD REPORT].

Second, why would market players develop and offer climate commitment instruments? We argue that the idea of costly signaling also can motivate market players to offer such a service (and profit from it), responding to demand from potential signalers. Our proposed instruments thus leverage the emerging field of green finance to create a commitment device that fills a significant gap in the regulation of climate pledges.

Although this Article focuses on corporate climate commitments, universities, medical centers, religious and civic organizations, and even governments motivated to make credible climate commitments can also use the proposed instruments. Further, our proposed instruments can be part of the bundle of measures that governments and non-governmental organizations (NGOs) use to pressure companies to reduce GHG emissions. The instruments can also be adapted to facilitate credible commitments on a wide range of non-climate topics for which a company or other organization wants to benefit from a credible current commitment to achieve a long-term goal, such as biodiversity, human rights, and other social challenges.

I. THE EMERGING FIELD OF CORPORATE CLIMATE COMMITMENTS

Part I sets the scene for our two new proposed instruments by explaining trends in corporate climate commitments and their role in the global effort to reduce the risks of climate change. Part II then explores the public and private standards that apply to corporate climate commitments and why they are inadequate in response to greenwashing concerns.

A. Trends in Commitments

Numerous public and private initiatives are underway to disclose and monitor corporate climate commitments, and the number of corporate climate commitments has grown substantially in recent years. For instance, more than 4,000 companies and financial institutions have registered climate commitments with the Science Based Targets Initiative (SBTi), an NGO that monitors and facilitates private sector GHG emissions reduction efforts.[27] Other indications of the widespread use of corporate climate commitments include the over 300 signatories to the Climate Pledge initiative[28] and the data in the NetZero tracker database, which indicates that roughly 800 of 2,000 assessed publicly listed companies have some kind of climate reduction commitment (some overlaps

27. By December 22, 2022, 4,237 entities had registered commitments with SBTi. *Companies Taking Action,* SCIENCE BASED TARGET INITIATIVE, https://sciencebasedtargets.org/companies-taking-action#table (last visited Jan. 6, 2022). (raw data from Dec. 22, 2022 on file with the authors).

28. By December 22, 2022 the Climate Pledge had 378 signatories. *Be the Planet's Turning Point,* THE CLIMATE PLEDGE, https://www.theclimatepledge.com/us/en (last visited Jan. 6, 2023) (raw data from Dec. 22, 2022 on file with the authors).

exist).[29] By the end of 2021, roughly two-thirds of the companies included in the S&P 500 had set a public carbon reduction target.[30]

Another significant initiative is the Net Zero Asset Owners Commitment (of the Paris Aligned Investment Initiative), through which asset owners can commit to ten specific actions to achieve Paris-aligned portfolios, including setting an interim portfolio emissions reduction target by 2030 or sooner.[31] The fifty-seven signatories of the commitment include many of the largest financial institutions in the world.[32] As we mentioned at the outset, the corporate climate commitments, if fulfilled, aggregate to roughly 3.2 to 4.2 billion tons of annual emissions reductions by 2030,[33] and emissions reductions at these levels[34] have the potential to contribute a large share of the reductions necessary to achieve the 2°C goal[35] and 1.5°C aspiration of the Paris Agreement.[36]

B. Existing Gaps in Corporate Climate Pledge Practice

Economists Tom Lyon and Wren Montgomery define greenwashing as "any communication that misleads people into adopting overly positive beliefs about an organization's environmental performance, practices, or products."[37] Greenwashing of climate change impacts occurs across a wide range of corporate sectors.[38] For example, a recent Stand.earth report found that the claims by fashion industry brand leaders that they were becoming "carbon neutral" or "climate positive" were not backed up with strong emission reduction or

29. *Recommendations and Current Realities*, NET ZERO BETA TRACKER, https://zerotracker.net/analysis/recommendations-and-current-realities (last visited Jan. 6, 2022) (web report from December 22, 2022 on file with the authors).

30. Jean Eaglesham, *Climate Promises by Businesses Face New Scrutiny*, WALL ST. J. (Nov. 5, 2021), https://www.wsj.com/articles/climate-promises-by-businesses-face-new-scrutiny-11636104600.

31. *New Global Effort Launches for Investors to Achieve Net-Zero Portfolios in Line with the Paris Agreement Goals*, CERES (Mar. 10, 2021), https://www.ceres.org/news-center/press-releases/new-global-effort-launches-investors-achieve-net-zero-portfolios-line. *See also Commitment*, PARIS ALIGNED ASSET OWNERS https://www.parisalignedassetowners.org/commitment/ (last visited Dec. 29, 2023).

32. *See* PARIS ALIGNED ASSET OWNERS, 2022 PROGRESS REPORT 3 (2022), https://www.parisalignedassetowners.org/media/2022/11/PAAO-Progress-ReportNovember2022_Final.pdf.

33. *See* Carbon Removal Corporate Action Tracker, *supra* note 2.

34. As we mentioned at the outset, the reductions in the corporate commitments are larger than the annual emissions of India and just behind the annual emissions of the United States. U.N. ENV'T PROG., EMISSIONS GAP REPORT 2022 (2022) https://www.unep.org/resources/emissions-gap-report-2022 [hereinafter 2022 UNEP EMISSIONS GAP REPORT]; *see* GHG emissions in India – Statistics & Facts, STATISTA, https://www.statista.com/topics/8881/emissions-in-india/#topicOverview (Feb. 28, 2024).

35. *See, e.g.*, Lin, *supra* note 11, at 734 (concluding that "[n]et zero commitments, if carried out, could contribute significantly to meeting Paris's temperature goals. How governments and corporations actually implement net zero pledges will be critical in determining whether those goals will be met and what a carbon-stabilized world will look like.").

36. The 1.5C commitment was most recently reiterated in the Sharm el-Sheikh Implementation Plan. *See* COP27 PLAN, *supra* note 16, at ¶ 4 (noting "that the impacts of climate change will be much lower at the temperature increase of 1.5°C compared with 2°C and *resolves* to pursue further efforts to limit the temperature increase to 1.5°") (internal citation omitted; emphasis in original).

37. Thomas P. Lyon & A. Wren Montgomery, *The Means and End of Greenwash,* 28 ORG. & ENV'T 223, 226 (2015) (identifying "varieties of greenwash").

38. Shanor & Light, *supra* note 6, at 2043 (defining greenwashing as involving statements that create a falsely positive impression about a company's environmental actions).

renewables targets and created false impressions about their actual decarbonization efforts.[39] As we discussed above, several concerns have arisen that undermine the credibility of existing corporate climate pledges, including the adequacy of the commitment, the lack of credible global enforcement framework, the temporal problem (the difficulty of ensuring compliance with pledges that set long-term commitments), and concerns about the effects that inadequate commitments may have on support for more comprehensive government actions.

A recent Corporate Climate Responsibility Monitor (CCRM) report, published in February 2022, provides some support for these greenwashing concerns. The report evaluated the integrity of corporate climate pledges across four dimensions: (1) tracking and disclosure of emissions; (2) the existence of specific and substantiated targets; (3) measures taken for reducing the company's own emissions; and (4) responsibility for unabated emissions. It found that current corporate practice in each dimension often falls below good practice principles.[40] Regarding the disclosure dimension, it found that the surveyed companies did not provide sufficiently comprehensive details on their GHG emissions on an annual basis, and they failed to identify specific emission sources (including Scope 1, 2, and 3 emissions) or historical data for each emission source.[41] Regarding the target-setting dimension, the report found that although most of the companies had set interim targets that were aligned with their long-term goals, their initial interim targets were not ambitious enough (assuming that meeting the 1.5°C limit requires immediate action to achieve a reduction in global CO2 emissions of about 45 percent from 2010 levels by 2030). It also found that most companies have failed to set specific emission reduction targets that are independent of offsetting claims.[42]

Regarding the dimension of own-emissions reduction, the CCRM study also found that many companies failed to implement and disclose the details of their decarbonization measures.[43] Finally, regarding responsibility for unabated emissions, it concluded that companies did not clearly disclose how and whether they intend to use carbon offsets as part of their mitigation plans. Offsets can be problematic if they do not lead to genuine emissions reductions, and CCRM concluded that most companies do not commit to procuring only high-quality credits.[44] Other observers have raised similar concerns.[45]

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39. *See Fossil-Free Fashion Scorecard 2021*, STAND.EARTH, https://stand.earth/fashion/fossil-free-fashion/key-findings/ (last visited Jan. 6, 2022); Lucianne Tonti, *Fashion Brands Grapple with Greenwashing: 'It's Not a Human Right to Say Something is Sustainable',* THE GUARDIAN (Nov. 18, 2022), https://www.theguardian.com/fashion/2022/nov/19/fashion-brands-grapple-with-greenwashing-its-not-a-human-right-to-say-something-is-sustainable.

40. CCR REPORT, *supra* note 9, at 13.

41. *Id.* at 18-20 (noting that extraordinarily high emissions in specific historical years can conceal the significance of targets).

42. *Id.* at 21-22.

43. *Id.* at 28-35.

44. *Id.* at 37.

45. *See, e.g.*, BRAGG ET AL., *supra* note 9, at 13; CARA BOTTORFF ET AL ., SIERRA CLUB., THE DIRTY TRUTH ABOUT UTILITY CLIMATE PLEDGES VERSION 2, at 1-2 (Oct. 2022), https://www.sierraclub.org/

Without a robust compliance framework for fulfilling climate commitments, regulators, NGOs, and others lack confidence that these commitments will ultimately be fulfilled and will adequately reduce emissions if they are fulfilled.[46] The risk of non-fulfillment is our focus in this Article.[47] As we mentioned at the outset, this concern about corporate climate commitments was also a major focus of COP27 at Sharm el-Sheikh, Egypt.[48]

C. The Regulation of Climate Pledges

Companies, especially publicly traded companies with transnational business and high visibility, face increasing pressure to issue climate pledges. This pressure includes formal legal requirements as well as informal social and economic pressure arising from various stakeholders in addition to governments: investors, financial institutions, environmental NGOs, retail customers, corporate customers, local communities, and the media.[49] The complex compliance framework for climate pledges has developed in three pillars: government disclosure regulatory regimes, private environmental governance initiatives, and risks arising from consumer protection and tort laws. As we elaborate below, however, this complex compliance framework is not sufficiently robust to ensure that corporations are making commitments that will be fulfilled in the future.

1. Government Regulatory Regimes

Corporate climate pledges emerged over the last decade in response to the slow pace and limited reach of public climate regulation at the international,

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sites/www.sierraclub.org/files/2022-09/sierra_club_the_dirty_truth_report_v2_2022_0.pdf.

46. Anders Bjørn et al., *Can Science-Based Targets Make the Private Sector Paris-Aligned? A Review of the Emerging Evidence*, 8 CURRENT CLIMATE CHANGE REPORTS 53, 66 (2022); Nathan Campbell, *The Duty to Update Corporate Emissions Pledges*, 74 Vand. L. Rev. 1137, 1157-61 (2021); Jannik Giesekam et al., *Science-Based Targets: On Target*?, 13(4) SUSTAINABILITY 1657, 1657 (2021); *see* Todd Gillespie et al., *Time's Up on Corporate America's 2020 Climate Goals. Here's the Results*, BLOOMBERG (Dec. 14, 2020), https://www.Bloomberg.Com/graphics/2020-company-emissions-pledges/.

47. *See* Adam Morton, *U.N. Experts Demand Crackdown on Net Zero Pledges*, THE GUARDIAN (Nov. 8, 202274 Vand. L. Rev. 1137 (2021); Todd Gillespie et al., *Time's Up on Corporate America's 2020 Climate Goals. Here's the Results*, BLOOMBERG (Dec. 14, 2020), https://www.theguardian.com/environment/2022/nov/08/un-experts-demand-crackdown-on-greenwashing-of-net-zero.Bloomberg.com/graphics/2020-company-emissions-pledges/.

47. *See* Morton, *supra* note 5 (noting that "[n]et zero plans already adopted have drawn criticism for being vague, delaying action until it is too late and relying too heavily on reductions claimed from unrelated nature-based offset l projects, such as tree planting and supporting forest regrowth"); *see generally* EXPERT REPORT, *supra* note 4.

48. *See* Morton, *supra* note 5 (noting that "[n]et zero plans already adopted have drawn criticism for being vague, delaying action until it is too late and relying too heavily on reductions claimed from unrelated nature-based offset projects, such as tree planting and supporting forest regrowth"); *see generally* EXPERT REPORT, *supra* note 4.

49. *See, e.g.*, Michael P. Vandenbergh & Jonathan M. Gilligan, *Beyond Gridlock*, 40 COLUM. ENV'T L.J. 217, 248-49 (2015) (identifying corporate motivations for climate change mitigation); *see generally* Markus Kitzmueller & Jay Shimshack, *Economic Perspectives on Corporate Social Responsibility*, 50 J. ECON. LIT. 51 (2012) (discussing corporate incentives to engage in corporate social responsibility).

transnational, and national levels. The 2022 UNEP Emissions Gap report[50] emphasized the shortfall in government climate mitigation actions, concluding that "[p]olicies currently in place with no additional action are projected to result in global warming of 2.8°C over the twenty-first century. Implementation of unconditional and conditional NDC scenarios [in other words, government laws and policies] reduce this to 2.6°C and 2.4°C respectively" and that "[t]o get on track for limiting global warming to 1.5°C, global annual GHG emissions must be reduced by 45 percent compared with emissions projections under policies currently in place in just eight years, and they must continue to decline rapidly after 2030, to avoid exhausting the limited remaining atmospheric carbon budget."[51] The policy implications are clear: "broad-based economy-wide transformations are required to avoid closing the window of opportunity to limit global warming to well below 2°C, preferably 1.5°C."[52]

Against this background, policy makers in the E.U. and the U.S. have not only attempted to regulate GHG emissions directly, but also to increase the pressure on corporations to step up their climate actions. Unfortunately, as our discussion below suggests, this attempt has had only limited success thus far.

a. European Union

The E.U. has some of the most ambitious climate legislation in the world today.[53] The European Green Deal includes a commitment to achieve climate neutrality in 2050,[54] which is based on several key elements:

> (1) The European Climate Law,[55] which sets a legally binding target of net zero greenhouse gas emissions by 2050 and addresses the necessary steps to achieve this target, such as establishing an interim target for 2030 of reducing net GHG emissions by at least 55 percent compared to levels in 1990;[56]

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50. *See* 2022 UNEP EMISSIONS GAP REPORT, *supra* note 34.

51. *Id.* at xv.

52. *Id.* at xvi.

53. *See* Stepping Up Europe's 2030 Climate Ambition, EUR. COMM.(2020), https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0562.

54. *See generally A European Green Deal: Striving to be the First Climate-Neutral Continent,* EUR. COMM, https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en (last visited Jan. 4, 2023); *Communication from the Commission: the European Green Deal*, EUR. COMM. COM (2019) 640 final (Nov. 19, 2019).

55. Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021, establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ('European Climate Law'), 2021 O.J. (L 243) 1–17. *See generally* Karen Bäckstrand, *Towards a Climate-Neutral Union by 2050? The European Green Deal, Climate Law, and Green Recovery* in ROUTES TO A RESILIENT EUROPEAN UNION 39 (Antonina Bakardjieva Engelbrekt et al., eds., 2022) (analyzing European climate policy).

56. Also relevant in this context are the Effort Sharing Regulation, which establishes binding GHG emissions pathways at the Member State level, and the Land Use, Land Use Change and Forestry (LULUCF) Regulation, which obliges Member States to ensure that the net carbon sink from land use does not deteriorate. *See generally* Regulation (EU) 2018/842 of the European Parliament and of the Council of 30 May 2018 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No 525/2013 2018 O.J. (L 156), 26; Regulation (EU) 2018/841 of the

> (2) The Emissions Trading System (ETS) Directive, which establishes a cap and trade system for large industrial and power sector installations and the aviation sector to reduce emissions by forty-three percent by 2030 compared to 2005;[57]
>
> (3) The Directive on the Disclosure of Non-Financial and Diversity Information,[58] which requires large corporations to disclose, on an annual basis, information relating to environmental matters, social and employee-related matters, respect for human rights, anti-corruption, and bribery matters;[59]
>
> (4) a proposed directive on empowering consumers for the green transition, designed to enhance consumer rights in making informed choices to enable consumers to actively transition to a climate-neutral society (Empowering Consumers Directive).[60] In addition, the E.U. also adopted a series of green-energy acts that contribute to its general climate strategy.[61]

Several aspects of the E.U. regulatory framework will likely make it harder for corporations to issue dubious pledges. First, the ETS directive pressures corporations operating in energy-intensive sectors to reduce their emissions.[62] To increase the pace of emissions cuts in phase 4 of the ETS (2021-2030), the

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European Parliament and Council of 30 May 2018 on the inclusion of greenhouse gas emissions and removals from land use, land use change and forestry in the 2030 climate and energy framework, and amending Regulation (EU) No 525/2013 and Decision No 529/2013 2018 O.J. (L 156) 1.

57. *See* Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a system for GHG allowance trading within the Union and amending Council Directive 96/61/EC, 2003 O.J. (L 275) 32; *EU Emissions Trading System,* EUR. COMM., https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets_en (last visited Jan. 6, 2023); Misato Sato et al., *Allocation Allocation Allocation! The Political Economy of the Development of the European Union Emissions Trading System,* 13 WIREs CLIMATE CHANGE 796 (2022); EUR. COMM., *The EU Emissions Trading* System (EU ETS), https://climate.ec.europa.eu/system/files/2016-12/factsheet_ets_en.pdf (last visited Mar. 28, 2024).

58. Directive (EU) 2014/95/EU of the European Parliament and the Council of 22 October 2014 amending Directive 2013/34/EU as regards disclosure of non-financial and diversity information by certain large undertakings and groups, 2014 O.J. (L 330) 1. A related instrument is Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment and amending Regulation (EU) 2019/2088. *See* 2020 O.J. (L 198) 13.

59. The directive applies to large public-interest companies with more than 500 employees, which covers approximately 11,700 companies across the European Union. *Corporate Sustainability Reporting,* EUR. COMM, https://finance.ec.europa.eu/capital-markets-union-and-financial-markets/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting_en (last visited Jan. 4, 2022).

60. *See generally* Directive (EU) of the European Parliament and of the Council amending Directives 2005/29/EC and 2011/83/EU as regards empowering consumers for the green transition through better protection against unfair practices and better information Brussels, COM (2022) 143 final (Mar. 3, 2022) [hereinafter Empowering Consumers Directive].

61. *See, e.g.,* European Parliament, *Energy Policy: General Principles,* FACT SHEETS ON THE EUROPEAN UNION, https://www.europarl.europa.eu/factsheets/en/sheet/68/energy-policy-general-principles (last visited Dec. 27, 2022) (on energy efficiency and renewable energy).

62. The sectors covered by the ETS include electricity and heat generation and also energy-intensive industries such as commercial aviation; oil refining; and production of steel, iron, aluminum, cement, lime, glass, ceramics, paper, acids, and bulk organic chemicals. The complete list is available from the Union Registry. *Union Registry,* EUR. COMM, https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/union-registry_en (last visited Jan. 4, 2023). The registry includes compliance data for all registered firms. *Id.*

overall number of emission allowances will decline at an annual rate of 2.2 percent from 2021 onwards, compared to 1.74 percent in the preceding phase.[63] Firms covered by the ETS therefore have a strong incentive to develop plans to reduce their future emissions.

Second, the Directive on the Disclosure of Non-Financial Information requires companies to disclose information on their climate performance. In guidelines published by the E.U. Commission in 2019,[64] the Commission clarified that this Directive requires companies to disclose any climate-related targets they have adopted, to explain how they engage with upstream and downstream partners to promote climate mitigation, to describe whether and how their remuneration policies take account of climate-related performance, and to report their climate performance against the indicators used and targets set. The guidelines also identify how the performance data should be reported (e.g., concerning Scope 1, 2, and 3 emissions).[65]

In addition, at the end of 2022, the European Parliament and Council formally adopted a new Corporate Sustainability Reporting Directive ("CSRD"), which will expand and strengthen the rules on sustainability disclosure.[66] The initial companies subject to the CSRD will have to apply the new rules for the first time in the financial year 2024 for reports published in 2025. The 2022 CSRD envisages the adoption of E.U. sustainability reporting standards, with the European Financial Reporting Advisory Group (EFRAG) developing the draft standards. A European Parliament report has estimated that the new CSRD obligations will cover more than 50,000 companies, a significant increase from the 11,700 companies covered by the existing Non-Financial Reporting Directive.[67] Finally, the Empowering Consumers Directive will prohibit companies from making claims regarding their future climate performance in the form of a transition to carbon neutrality if the claims lack clear, objective, and verifiable commitments and targets. Companies also will be required to support these claims with an independent monitoring system to check their progress.[68]

In the aggregate, these E.U. government initiatives can be expected to increase the pressure on companies subject to E.U. law to both issue more ambitious climate pledges and fulfill those commitments. It is less clear whether

63. *See Revision for Phase 4 (2021-2030),* EUR. COMM., https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/revision-phase-4-2021-2030_en (last visited Jan. 4, 2023); *see also* James Killick et al., *European Parliament and Council Adopt Positions on ETS and CBAM Proposals: Next Steps—Final Agreement & Formal Adoption,* WHITE & CASE (July 6, 2022), https://www.whitecase.com/insight-alert/european-parliament-and-council-adopt-positions-ets-and-cbam-proposals-next-steps (giving an overview of the changes).

64. Communication from the Commission — Guidelines on non-financial reporting: Supplement on reporting climate-related information, 2019 O.J. (C 209) 1.

65. *See id.* § 3.5.

66. *See* Directive (EU) 2022/2464 of the European Parliament and the Council of 14 December 2022 amending Regulation (EU) No 537/2019; Directive 2004/109/EC, Directive 2006/43/EC and Directive 2013/34/EU, as regards corporate sustainability reporting, 2022 O.J. (L 322) 15.

67. *Sustainable Economy: Parliament Adopts New Reporting Rules for Multinationals,* EUR. PARL. NEWS (Oct. 11, 2022), https://www.europarl.europa.eu/news/en/press-room/20221107IPR49611/sustainable-economy-parliament-adopts-new-reporting-rules-for-multinationals.

68. *See* Empowering Consumers Directive, *supra* note 60, at preamble ¶ 4.

E.U. initiatives can solve the temporal problem since they fall short of providing legal assurance that commitments with a long time horizon (e.g., a decade or more) will be fulfilled. In addition, many large companies do not have sufficient ties with E.U. countries to be subject to the E.U. requirements, and many small and medium-sized businesses outside of Europe are not likely to be affected by the E.U. initiatives unless they are subject to supply chain requirements from large firms that do business in Europe.

b. United States

The U.S is behind the E.U. on government initiatives to regulate corporate climate pledges. Although regulators are active at the federal level and in some states, the public regulatory framework has yet to develop standards that address concerns about the credibility of corporate climate commitments.[69] Under U.S. law, corporate disclosure not mandated by SEC regulation is policed by the antifraud provisions of the Exchange Act Section 10(b) and, by extension, Rule 10b-5 and its associated private right of action. 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." This rule applies with equal force to both mandated and voluntary disclosures.

U.S. securities laws thus include provisions that may make a corporation and its high-level management liable for misrepresenting facts related to its business operations, creating risks for companies that make public climate commitments. However, forward-looking statements, such as climate pledges, create lower risks than disclosure of current or past information.

The SEC has clarified its interpretations of corporate disclosure obligations regarding climate change through regulatory initiatives that have focused on climate change-related disclosure and ESG disclosure, both of which are relevant to corporate climate commitments. Regarding climate disclosure, the SEC issued a guidance in 2010 that called attention to the need for companies to disclose the physical and transition risks of climate change but did not explicitly address the problem of credible climate commitments.[70]

In 2024, the SEC promulgated a rule that builds on the 2010 guidance regarding the physical and transition risks that companies are required to disclose and that, if it withstands judicial review, will require disclosure of additional climate issues, including reporting on Scope 1 and 2 emissions in some cases. Although the proposed rule would have required disclosure of Scope 3 emissions if they comprise a large share of total corporate emissions,[71] that requirement

69. Shreyas Vangala et al., *Revisiting the Biden Administration's Approach to Climate Change*. 39 CLIMATE & ENERGY 1, 9 (2022).

70. Commission Guidance Regarding Disclosure Related to Climate Change, 75 Fed. Reg. 6,290, 6,293 – 6,297 (Feb. 8, 2010) (to be codified at 17 C.F.R. pt. 211, 231, 241).

71. *See* The Enhancement and Standardization of Climate-Related Disclosures for Investors, 87 Fed. Reg. 21,334 (2022) (revising 17 CFR 210, 229, 232, 239, and 242) [hereinafter SEC Proposed Climate Disclosure Rule].

was one of many that were pared back in the final SEC rule. The final rule requires limited disclosure of GHG or climate-related targets and goals as well as climate-related financial metrics.[72]

In addition, in September 2022, the SEC issued a draft enforcement letter signaling the issues it will focus on when reviewing climate disclosures.[73] The target- and goal-focused requirements will require more specificity about the commitment and its implementation and create some risk of SEC enforcement for false or misleading statements, making it increasingly difficult for companies to issue inadequate climate pledges. Forward-looking statements pose lower enforcement and litigation risks than other statements, however, and the disclosure requirements included in the SEC rule[74] will not resolve the temporal problem: how a company today can provide assurance that it will comply with a goal or target that may be set a decade or several decades in the future. The proposed rule also has yet to be finalized, and its status will remain unclear for some time. The proposed rule provoked critical comments from some stakeholders, and it has already provoked a judicial challenge that is likely to reach a Supreme Court with a narrow view of agencies' discretion to apply existing statutory authorities to address climate change.[75]

The SEC is also dedicating more resources to the issue of ESG disclosure. On March 4, 2021, the SEC announced the creation of a Climate and ESG Task Force in the Division of Enforcement. Consistent with increasing investor focus and reliance on climate and ESG-related disclosure and investment, the Climate and ESG Task Force is developing various ways to identify ESG-related misconduct,[76] focusing on identifying any material gaps or misstatements in issuers' disclosure of climate risks under existing rules. The task force is also analyzing disclosure and compliance relating to investment advisers' and funds' ESG strategies. However, to date, it has not produced regulations or guidance that address long-term climate commitments.

The U.S. securities laws thus provide some incentives for publicly traded companies to fulfill near-term climate commitments and avoid fraudulent behavior but create little incentive to ensure that companies will honor their long-term climate commitments. Courts have generally been reluctant to find liability

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72. *See* The Enhancement and Standardization of Climate-Related Disclosures for Investors, Release Nos. 33-11275; 34-399678 (March 6, 2024).

73. *Sample Letter to Companies Regarding Climate Change Disclosures,* U.S. SEC. & EXCH. COMM'N, https://www.sec.gov/corpfin/sample-letter-climate-change-disclosures (last visited Jan. 25, 2023).

74. For a recent discussion of the application of securities law to net zero commitments and climate disclosure, and the limited risks arising from forward-looking and general statements, *see* Lin, *supra* note 11, at 711-33; Harper Ho, *supra* note 11, at 286-03.

75. *See* W. Virginia v. EPA, 597 U.S. 697 (2022). *See also* Liberty Energy, Inc. v. SEC, No. 24-60109 (5th Cir. May 15, 2024) (order granting stay of SEC climate rule).

76. *SEC Announces Enforcement Task Force Focused on Climate and ESG Issues,* U.S. SEC. & EXCH. COMM'N (Mar. 4, 2021), https://www.sec.gov/news/press-release/2021-42; *see also Risk Alert: The Division of Examinations' Review of ESG Investing*, U.S. SEC. & EXCH. COMM'N (Apr. 9, 2021) https://www.sec.gov/files/esg-risk-alert.pdf.

in private actions under Rule 10b-5 for forward-looking statements.[77] Publicly traded companies' statements that do not identify immediate and concrete goals are less vulnerable than those that do. In addition, the SEC indicated in the preamble to its proposed climate disclosure rule that safe harbor provisions will apply to statements about climate goals and targets.[78] Ironically, U.S. securities laws thus induce publicly traded firms to set goals with long time horizons and broad terms. A company faces limited risks under securities law if it fails to fulfill a commitment made in good faith because of business or organizational considerations (costs, technical difficulties, etc.) and faithfully discloses the relevant information about its commitment and progress.[79] Yet achieving adequate levels of climate change mitigation may require the opposite: clear, rigorous, long-term as well as short-term goals, along with strong incentives to achieve them.[80]

2. Private Environmental Governance

Public regulation thus has not provided a sufficiently robust compliance framework to ensure that companies abide by their long-term climate pledges. This failure has brought attention to the increasing role of private standards in regulating climate pledges. Despite substantive progress in the scale and ambition of the various private schemes that operate in this domain, the private regulatory effort thus far has been insufficient to address the public regulatory gap.

Market forces provide incentives for corporations to create and fulfill their pledges. Social and market costs to the firm could arise if adverse reactions occur from customers, employees, investors, lenders, insurers, and the communities in which firms function.[81] But because attaining information about the

77. The Private Securities Litigation Reform Act of 1995 ("PSLRA") provides a safe harbor for forward-looking statements, and courts have interpreted the safe harbor broadly. 15 U.S.C. § 78u-5(c)(1) (codifying part of the PSLRA, Pub. L. 104–67, 109 Stat. § 737)**;** *see, e.g.*, Inst'l Investors Grp. v. Avaya, Inc., 564 F.3d 242, 273-74 (3d Cir. 2009) (concluding that projections "are a classic forward-looking statement under the PSLRA's Safe Harbor provision").

78. *See* SEC Proposed Climate Disclosure Rule, 87 Fed. Reg. at 21,407 A registrant's disclosure of its climate-related targets or goals should not be construed to be promises or guarantees. To the extent that information regarding a registrant's climate-related targets or goals would constitute forward-looking statements, which we would expect, for example, with respect to how a registrant intends to achieve its climate-related targets or goals and expected progress regarding those targets and goals, the PSLRA safe harbors would apply to such statements, assuming all other statutory requirements for those safe harbors are satisfied.

79. For a discussion regarding corporate climate commitments, *see* Lin, *supra* note 11, at 711-30.

80. Several U.S. states have attempted to adopt corporate requirements regarding climate commitments, but to date these efforts have been largely unsuccessful. For instance, a proposed version of the Climate Corporate Accountability Act would have required large companies that do business in California to set science-based emission targets consistent with Paris' 1.5°C temperature goal, but the requirement was ultimately removed from the draft legislation. For a discussion of state climate actions regarding net zero pledges, *see* Lin, *supra* note 11, at 711-33.

81. *See* MICHAEL P. VANDENBERGH & JONATHAN M. GILLIGAN, BEYOND POLITICS: PRIVATE GOVERNANCE RESPONSE TO CLIMATE CHANGE 181-86 (2017). *See also* Doug Kysar, *Sustainable Development and Private Global Governance*, 83 TEX. L. REV. 2109, 2152-53 (2005) (discussing the role of consumer pressure); Daniel C. Esty & Quentin Karpilow, *Harnessing Investor Interest in*

appropriateness of climate pledges and the extent to which corporations comply with their provisions is difficult and costly, external observers such as journalists and NGOs find it difficult to provide oversight of corporate behavior. As a result, distinguishing robust climate commitments that are likely to be implemented from those that are weak or unlikely to be implemented is very difficult.[82]

Increasingly the oversight of climate pledges has moved into the hands of private governance initiatives, in some cases with limited government involvement, that provide a framework through which companies can submit their pledges. The major players in this area include the Science Based Targets initiative (SBTi), the Climate Pledge, the Pledge to Net Zero (which focuses on organizations from the environmental sector), and the Climate Neutral Now scheme.[83] In addition, the Race to Zero platform acts as an umbrella framework for climate pledges initiatives and provides some meta-regulatory oversight.[84] Although these initiatives provide an important regulatory service and compensate to some extent for the lack of robust public regulation, the fragmented and ambiguous regulatory framework they have established is not sufficiently robust to deter corporations from breaching their commitments in the future.[85] Other leading examples of public-private initiatives are the International Organization for Standardization (ISO) standard for assessing net zero commitments,[86] and the Task Force on Climate-Related Disclosure (TCFD) global corporate climate risk disclosure standards.[87] These initiatives increase the pressure on companies to make adequate climate commitments and provide incentives to avoid making false or misleading climate statements. Still, they do not provide mechanisms to ensure companies fulfill their future commitments.

Companies can game the system, for example, by choosing a long-term target such as 2050 and by avoiding ambitious interim targets (thus also avoiding committing to definitive accumulated emission reductions), by choosing a high emissions base-year against which reductions will be measured, by avoiding a commitment to the use of high-quality carbon offsets, and by being ambiguous

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Sustainability: the Next Frontier in Environmental Information Regulation, 36 YALE J. REG. 625, 632-33 (2019) (discussing the role of reputation in employee recruitment and retention).

82. *See* BOTTORFF ET AL., *supr*a note 45. *See, e.g.,* BRAGG ET AL., *supra* note 9, at 37 (noting difficulties in evaluating robustness of climate pledges).

83. *See* SCIENCE BASED TARGETS, https://sciencebasedtargets.org/ (last visited Jan. 5, 2024) (Science Based Target initiative), THE CLIMATE PLEDGE, https://www.theclimatepledge.com (last visited Jan. 5, 2024), (Climate Pledge), *The Net Zero Carbon Buildings Commitment,* WORLD GREEN BUILDING COUNCIL https://worldgbc.org/thecommitment/ (last visited Jan. 5, 2024), UNFCCC, *Climate Neutral Now,* UN CLIMATE CHANGE, https://unfccc.int/climate-neutral-now (last visited Jan. 5, 2024).

84. UNFCCC, *Meet Our Partners,* RACE TO RESILIENCE RACE TO ZERO, https://racetozero.unfccc.int/meet-our-partners/ (last visited Jan. 5, 2024) (full list).

85. Fragmentation of climate governance is a problem highlighted by Shelley Welton. *See* Welton, *supra* note 8, at 219-20.

86. *See* International Organization for Standardization, *Net Zero Guidelines*, INT'L ORG. FOR STANDARDIZATION, https://www.iso.org/netzero (last visited Jan. 6, 2022) [hereinafter ISO Guidelines].

87. *See* TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES, FINAL REPORT: RECOMMENDATIONS OF THE TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES (2017), https://assets.bbhub.io/company/sites/60/2020/10/FINAL-2017-TCFD-Report-11052018.pdf.

about the inclusion of Scope 3 emissions, all of which can undermine the adequacy and integrity of the commitment.[88] Some of these private systems, such as SBTi, have included transparency and other elements that address these problems, but by providing corporations with what appears on the surface to be a legitimate regulatory "harbor," the current private governance system in the aggregate risks facilitating the greenwashing behavior that Shelley Welton, Tom Lyon, Wren Montgomery, and others have discussed.[89]

Several features of the private regulatory framework undermine its capacity to deter firms from making non-credible pledges. Most schemes are based on a similar regulatory structure, which consists of two stages: a submission stage in which the candidate firm submits its proposed pledge; and a reporting stage in which it commits to publishing periodical reports on its progress. The first difficulty concerns the wide divergence between the schemes' strictness of their preliminary review and reporting requirements. This can allow firms to engage in forum-shopping, choosing schemes with more lenient requirements. A detailed comparative analysis of the regulatory structure of each of the existing schemes is beyond the scope of this Article, but a few examples demonstrate the wide differences between them.

The SBTi is a leading private initiative, and it is poised to become even more influential as new U.S. federal procurement rules push federal contractors to make SBTi commitments. SBTi has a strict preliminary assessment process in which firms have a maximum of twenty-four months to: "1) Develop a science-based target aligned with the SBTi criteria; 2) Submit the target to the SBTi for validation; 3) Publish your approved target on the SBTi website." Organizations that fail to complete these steps within twenty-four months will be removed from the SBTi Companies Taking Action webpage.[90] The SBTi Corporate Net-Zero Standard governs the target development process.[91] In contrast, other schemes have a much more lenient preliminary assessment process. For instance, neither the Climate Pledge nor the Pledge to Net Zero has a process requiring signatories to have their targets validated and approved.[92]

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88. Giesekam et al., *supra* note 46, at 14 (noting that due to the importance of cumulative emissions, targets will be less effective if a larger proportion of reductions occur later in the target period). For a more general critique of private governance instruments, *see generally* Oren Perez*, The Green Economy Paradox: A Critical Inquiry into Sustainability Indexe*s, 17 MINN. J.L. SCI. & TECH. 153 (2016) (criticizing the idea of 'green growth,' which underpins the work of sustainability indexes).

89. *See* Welton, *supra* note 8, at 195-98; *see generally* A. Wren Montgomery, Thomas P. Lyon & Julian Barg, *No End in Sight? A Greenwash Review and Research Agenda*, ORGANIZATION & ENVIRONMENT (May 9, 2023) https://doi.org/10.1177/10860266231168905; Shanor & Light, *supra* note 6, at 2035-10.

90. *See* SCIENCE BASED TARGETS, SCIENCE BASED TARGETS INITIATIVE COMMITMENT LETTER 3 (2023) [hereinafter COMMITMENT LETTER].

91. SCIENCE BASED TARGETS, SBTI CORPORATE NET-ZERO STANDARD 14 (Oct. 2021) [hereinafter SBTI STANDARDS].

92. *See Climate Pledge FAQ: Does My Company or Organization Need to Set Science-Based Targets to Join The Climate Pledge*, CLIMATE PLEDGE, https://www.theclimatepledge.com/us/en/the-pledge/FAQ#question-2 (last visited Jan. 4, 2022) [hereinafter FAQ 2]; *Guidance Tools & Resources,* PLEDGE TO NET ZERO, https://www.pledgetonetzero.org/guidance (last visited Jan. 4, 2022) [hereinafter PNZ Guidance].

Another major difference between the preliminary assessment aspects of the private systems concerns their commitment to setting near-term targets. For the SBTi, this is a critical element of the program. Under the 2021 SBTi strategy, SBTi increased the minimum ambition of its near-term targets, which as of July 15, 2022, became 1.5°C for scope 1 and 2 targets and well below 2°C for Scope 3 targets. Even more crucially, 2021 set a preferred timeframe for targets of five to ten years and no longer five to fifteen years.[93] Other schemes do not require companies to set near-term targets as a precondition for becoming signatories. For instance, the Climate Pledge states that "signatories are expected to have near-term goals" and that "[c]ompanies that have not yet set near-term targets within 12 months of signing the Pledge will be eligible [but not obliged][94] to join a Climate Pledge Accelerator Program" to help them set near term targets.[95] Similarly, the Pledge to Net Zero scheme encourages signatories to set mid-term targets but emphasizes that they are optional.[96]

Finally, most of these systems allow their signatories to report their emissions according to various standards and platforms, creating risks of reporting inconsistencies. Thus, for example, the SBTi requires organizations to disclose their emissions annually and monitor progress "through CDP, annual reports, sustainability reports and your company's website."[97] A similar approach was adopted by the Pledge to Net Zero and The Climate Pledge.[98] However, many of these systems rely on the GHG Protocol for carbon accounting and CDP for carbon disclosure, so the risks of reporting inconsistencies are not as great as the risks of not fulfilling pledges.

However, the principal difficulty with these schemes concerns the lack of a compliance instrument, particularly for long-term pledges. None of the foregoing schemes includes a compliance framework that proactively scrutinizes the firm's performance against its submitted plan, giving special attention to interim targets. SBTi acknowledged this shortcoming in its recent annual progress report, which highlighted the issue of corporate climate accountability as a key future challenge.[99] The report quotes U.N. Secretary-General António Guterres's recent statement that "[t]here is a deficit of credibility and a surplus of confusion over emissions reductions and net-zero targets, with different meanings and different

93. COMMITMENT LETTER, *supra* note 90, at 3.

93. SBTI STANDARDS, *supra* note 91, at 46.

94. We have added the "but not obliged" language to call attention to difference between the commitment required for the long-term and short-term goals.

95. *See* FAQ 2, *supra* note 92.

96. PNZ GUIDANCE, *supra* note 91, at 6; *About the Climate Pledge,* CLIMATE PLEDGE, https://www.theclimatepledge.com/us/en/the-pledge/About (last visited Jan. 21, 2024). The Climate Neutral Now has a stricter policy, which requires all signatories to report using a special template, based on dedicated guidelines. *See* UNFCC, ANNUAL REPORT USER'S GUIDE, UNITED NATIONS CLIMATE CHANGE, https://unfccc.int/climate-action/climate-neutral-now/report (last visited Jan. 21, 2024).

97. COMMITMENT LETTER, *supra* note 90, at 3.

98. *See* PNZ GUIDANCE, *supra* note 91, at 5.

99. SCIENCE-BASED NET-ZERO: SCALING URGENT CORPORATE CLIMATE ACTION WORLDWIDE, SCIENCE BASED TARGETS 35 (2022), https://sciencebasedtargets.org/resources/files/SBTiProgressReport 2021.pdf.

metrics."[100] The report further notes that in response to the enforcement gap, the SBTi has launched a new "measurement, reporting and verification (MRV) framework." The MRV framework will expand the SBTi climate alignment and certification framework from ambition (target-setting) to also include performance (target-delivery), and it will provide a clear and standardized instrument to assess, verify and enhance corporate accountability on progress towards science-based targets.[101]

Other private and public-private hybrid systems lag behind SBTi in their compliance efforts. For instance, the Climate Pledge does not offer a systematic standard for elaborating the signatories' compliance commitments.[102] Similarly, the Climate Neutral Now scheme emphasizes that it "does NOT certify the carbon or climate neutral status of any organization."[103] Race to Zero, which acts as an umbrella framework for climate pledge initiatives, has released a basic standard to which all the initiatives must conform. However, it does not have the capacity or the power to resolve the various ambiguities and shortcomings described above.[104]

3. Consumer Protection Laws and Tort Litigation

Finally, consumer protection laws and exposure to tort liability provide some incentives for corporations to ensure the integrity of their climate pledges. But as with the other public and private governance frameworks, these incentives are weak regarding long-term climate commitments. Most greenwashing litigation in the United States and Europe has focused on specific product or service claims.[105] Climate pledges' aspirational and contingent nature

100. *Id.*

101. SBTI aims to release the full framework ahead of COP28. It will present companies with clear expectations and set guidance on how to report, assess, and verify progress against the achievement of targets. This will enhance reporting data quality, and the accountability of SBTi companies, reinforcing trust and confidence among stakeholders. *Id.* at 36. *See also Measurement, Reporting, and Verification (MRV),* SCIENCE BASED TARGETS, https://sciencebasedtargets.org/measurement-reporting-and-verification-mrv (last visited Jan. 17, 2024).

102. *Frequently Asked Questions,* THE CLIMATE PLEDGE, https://www.theclimatepledge.com/us/en/the-pledge/FAQ (last visited Jan. 4, 2022).

103. GLOBAL CLIMATE ACTION, CLIMATE NEUTRAL NOW: GUIDELINES FOR PARTICIPATION, UNITED NATIONS CLIMATE CHANGE 31 (2020), https://unfccc.int/sites/default/files/resource/CNN%20Guidelines.pdf.

104. UNFCCC, RACE TO ZERO: STARTING LINE AND LEADERSHIP PRACTICES 2.0, UNITED NATIONS CLIMATE CHANGE (2021), https://racetozero.unfccc.int/wp-content/uploads/2021/04/Race-to-Zero-Criteria-2.0.pdf (establishing minimum criteria required for participation in the Race to Zero campaign).

105. A recent example is the litigation against Keurig Green Mountain based on its claim that the coffee pods of produces were recyclable, when a substantial number of nationwide recycling facilities would not actually accept them for recycling was false and misleading. A class action against Keurig ended in a settlement in which Keurig agreed to pay ten million dollars and to qualify its claims about pod recyclability with the disclaimer "Check Locally – Not Recycled in Many Communities." Kathleen Smith v. Keurig Green Mountain Case No. 18-cv-06690-HSG, (N.D. Cal. 2022). In a further development of this case Keurig Canada has reached an agreement with Canada Competition Bureau to pay a $3 million penalty for misleading consumers about the recyclability of its single-use plastic K-Cup pods. *See Keurig Canada to Pay $3 Million Penalty to Settle Competition Bureau's Concerns over Coffee Pod Recycling Claims,* COMPETITION BUREAU OF CANADA (Jan. 6, 2022), https://www.canada.ca/en/competition-bureau/news/2022/01/keurig-canada-to-pay-3-million-penalty-to-settle-competition-bureaus-concerns-

complicates efforts to prove that a specific pledge constitutes strategic greenwashing. To succeed with such a claim, complainants typically need to demonstrate that the firm knew, when it issued the pledge, that it would not be able to fulfill its provisions.[106]

In the U.S., enforcement of the Federal Trade Commission Act (FTCA) by the Federal Trade Commission (FTC), along with government and private actions under state consumer protection laws, provides some incentives for companies to make credible commitments.[107] Section 5 of the FTCA prohibits "unfair or deceptive acts or practices in or affecting commerce." The FTC has also developed "Green Guides" designed to help marketers avoid making environmental claims that mislead consumers.[108] However, federal and state consumer law does not resolve the problem of firms not abiding by their prior long-term commitments.[109]

In the last few years, NGOs have attempted to expand the boundaries of greenwashing claims to cover the overall climate strategy of the company. For example, in March 2021, three environmental groups—Global Witness, Greenpeace, and Earthworks—filed a false advertising complaint against Chevron with the FTC, alleging that the U.S. oil major has overstated its investment in renewable energy and actions to curb GHG gas emissions.[110] The complaint was the first to petition the FTC to use its Green Guides against an oil company for misleading consumers about its actions to combat climate change.[111] The complaint was thus the first to challenge Chevron's overall

over-coffee-pod-recycling-claims.html. A recent European case is the criminal investigation against the Deutsche Bank subsidiary DWS on suspicion of prospectus fraud related to "greenwashing.". The suspicion, which was backed by an insider whistleblower was that DWS has inflated the amount of money reported as 'ESG-integrated' in its 2020 annual report. *See* Antje Schiffler, *DWS and the Global Crackdown on Greenwashing*, MORNINGSTAR (Sept. 19, 2022), https://www.morningstar.co.uk/uk/news/226564/dws-and-the-global-crackdown-on-greenwashing.aspx.

106. We distinguish in this context between strategic greenwashing, which involves "deliberate and concerted efforts of organizations to portray themselves as more environmental friendly than justified," and operational green failures, which represent the difficulty of organizations to align "the subprocesses of realizing environmentally friendly behavior and communicating about environmental friendliness" (e.g., reflecting operational malfunctions such as intrafirm mis-communication, optimistic bias and unforeseen technological contingencies). Menno D.T. de Jong, Gabriel Huluba & Ardion D. Beldad, *Different Shades of Greenwashing: Consumers' Reactions to Environmental Lies, Half-Lies, and Organizations Taking Credit for Following Legal Obligations,* 34 J. OF BUS. & TECH'L COMM. 38, 43-44. Commonly, only strategic greenwashing could expose corporations to liability. In the case of long-term climate pledges, however, distinguishing between these two categories can be extremely difficult.

107. 15 U.S.C. § 45 (2012).

108. *See* FTC Guides for the Use of Environmental Marketing Claims, 16 C.F.R. § 260.1(a) (2012) (providing overview of the Green Guides); *See also Green Guides,* FTC, https://www.ftc.gov/news-events/topics/truth-advertising/green-guides (last visited Jan. 21, 2024).

109. *See* Lin, *supra* note 11, at 720-25 (providing an overview).

110. The FTC is the United States Federal agency charged with enforcing laws that prohibit false and deceptive claims in advertising. *See Mission,* FED. TRADE COMM, https://www.ftc.gov/about-ftc/mission (last visited Jan. 6, 2023). *See* Valerie Volcovici, *Green Groups File FTC Complaint Against Chevron Over Climate Claims*, REUTERS (Mar. 16, 2021), https://www.reuters.com/article/idUSKBN2B82D0/.

111. *See* Valerie Volcovici, *Green Groups File FTC Complaint Against Chevron Over Climate Claims*, REUTERS (Mar. 16, 2021), https://www.reuters.com/article/idUSKBN2B82D0/.

climate strategy, rather than focusing on a specific product or service,[112] but it is still uncertain how the response will unfold.

State consumer protection and tort claims are also a potential source of incentives for companies to avoid making misleading statements, such as climate commitments that are not credible. Actions against Exxon and other firms have been filed in Massachusetts, Connecticut, and other states. As Albert Lin noted, however, state laws typically take a narrow view of corporate liability for aspirational and forward-looking statements, making net zero and other commitments difficult to enforce under state law.[113] In sum, the attempt to extend the coverage of tort law and consumer law to companies' overall climate strategy is still in its infancy and unlikely to create incentives sufficient to induce companies to make credible climate commitments. As is the case of existing E.U. and U.S. regulations, these existing consumer and tort law options are simply not sufficient to hold companies to their climate promises in the long-term. New tools are needed.

II. CLIMATE PLEDGES AND COSTLY SIGNALING

As discussed in Part II, despite recent improvements, the existing public and private governance schemes fall short of ensuring the credibility of corporate climate commitments. We begin Part III by developing a theoretical framework to explain the challenge of distinguishing between firms committed to making a genuine climate pledge and those that merely pretend to be green. We also elaborate on how private ordering can complement the inadequate current governance framework. We then propose our two new financial instruments that are tailored to enable firms that seek to make credible commitments to credibly distinguish themselves from greenwashers.

A. Theoretical Framework

Despite the limited and inconsistent public regulatory pressure, firms face increasing commercial and civic pressure to demonstrate a commitment to responsible climate behavior beyond formal compliance. Issuing climate pledges is one path through which firms can signal such commitment. We distinguish in this context between firms that are committed to fulfilling their pledges (*true*

112. *See* Valerie Volcovici, *Green Groups File FTC Complaint Against Chevron Over Climate Claims*, REUTERS (Mar. 16, 2021), https://www.reuters.com/article/usa-ftc-greenwashing-idCNL1N2LE1OS. Similar allegations were made by Greenpeace France, Friends of the Earth France, and Notre Affaire à Tous against the French oil and gas company TotalEnergies, in a legal action filed at the Paris judicial court. *See Environmental Groups Sue TotalEnergies for Misleading the Public over Net Zero,* LES AMIS DE LA TERRE FRANCE (Mar. 3, 2022), https://www.amisdelaterre.org/communique-presse/environmental-groups-sue-totalenergies-for-misleading-the-public-over-net-zero/. For another example, see the complaint of ClientEarth against the oil company British Petroleum, submitted to the United Kingdom National Contact Point under the OECD Multinational Enterprises Guidelines. UK National Contact Point, *Initial Assessment: ClientEarth Complaint to the UK NCP About BP,* GOV.UK (June 16, 2020), https://www.gov.uk/government/publications/client-earth-complaint-to-the-uk-ncp-about-bp/initial-assessment-clientearth-complaint-to-the-uk-ncp-about-bp.

113. *See* Lin, *supra* note 11, at 724-25.

green firms)[114] and firms that issue pledges only to appease their various stakeholders but are not fully committed to abiding by their terms (*greenwashers*). Greenwashers produce false signals by representing themselves as green without changing their behavior. The challenge for firms that are genuinely committed to fulfilling their pledges is to find a way to distinguish themselves from greenwashers, given the ability of the latter to use false or ambiguous climate pledges to represent themselves as 'true-greens.'[115]

A possible solution to this communication dilemma is the idea of costly signaling developed independently by the biologist Amotz Zahavi[116] and the economist Michael Spence.[117] The puzzle at the core of Zahavi's and Spence's work is this: why do animals and humans produce costly and potentially detrimental signals? Prominent examples from biology include the stotting behavior of gazelles (jumping into the air),[118] the altruistic behavior of the Arabian babbler, and the peacock's tail (a highly visible display that increases risks from predators).[119] Examples from the economic literature include the costs of an MBA degree from an Ivy League institution and costly advertisement.[120] Zahavi and Spence explained this seemingly puzzling behavior as a signaling device. Animals use costly signals to convey their fitness and to distinguish themselves from unfit individuals.[121] Highly productive workers invest in costly education to distinguish themselves from less productive ones.[122]

What makes a signal credible is the existence of a differential cost structure. The cost of a credible signal should be higher for an untruthful signaler than for

114. By identifying corporations as "true green" we only suggest that they have incentives to fulfill their commitments at the time they are made and do not make normative claims about the motivations of firms or their managers. For a discussion of bright green and deep green organizations in the environmental movement, see Andrew J. Hoffman, *Shades of Green*, STANFORD SOCIAL INNOV. REV. 40 (Spring 2009).

115. *See* In & Schumacher, *supra* note 6, describing the dangers of this phenomenon:
Without proper checks in place, facilitated by mandatory, structurally solid, and science based MRV frameworks, carbonwashing could transform into one of the most severe and material risks to meaningful and broad climate action. Carbon data based on mostly theoretical ex-ante impact frontloading as opposed to concrete ex-post carbon reductions would render the modeling of informed Paris-aligned transition pathways highly unreliable.

116. *See generally* AMOTZ ZAHAVI ET AL., THE HANDICAP PRINCIPLE: A MISSING PIECE OF DARWINS PUZZLE (1999).

117. Michael Spence, *Signaling in Retrospect and the Informational Structure of Markets*, 92 AM. ECON. REV. 434 (2002).

118. *See* T.M. Caro, *The Functions of Stotting in Thompson's Gazelles: Some Tests of Predictions,* 34 ANIMAL BEHAVIOUR 663, 664-65 (1986), https://www.sciencedirect.com/science/article/abs/pii/S0003347286800525.

119. Zahavi, *supra* note 116, at xiii.

120. Amna Kirmani et al., *No Pain, No Gain: A Critical Review of the Literature on Signaling Unobservable Product Quality*, 64 J. OF MARKETING 66 (2000); Dorothea Kubler et al., *Job-Market Signaling and Screening: An Experimental Comparison*, 64(1) GAMES & ECON. BEHAV. 219, 221-223 (2009). The puzzle in the job market context arises because of the assumption that the investment in, for example, an MBA degree, has no productive or intrinsic value.

121. Rufus A. Johnstone, *Sexual Selection, Honest Advertisement & the Handicap Principle: Reviewing the Evidence,* 70 BIO. REVS. 1, 1-3 (1995); *see* Zahavi et al., *supra* note 116.

122. Andreas Bergh et al., *Higher Education, Elite Institutions and Inequality*, 53 EURO. ECON. REG. 376; Kubler et al., *supra* note 120, at 221-23.

an honest one.[123] A high-cost signal communicates an investment or sacrifice, which indicates the existence of a capability or trait that cannot be easily verified through other means. When the differential cost condition is satisfied, a separating equilibrium emerges that distinguishes between the two types—in our case, truly climate-committed firms and greenwashers.[124] When a separating equilibrium exists, the market can accurately distinguish between the two types.[125]

The challenge for companies that are motivated to make climate commitments, and for the regulators and climate advocates who are motivated to induce them to do so, is that it is very difficult today to assess the likelihood that a company will fulfill a climate commitment with a compliance date of 2030, 2040, or 2050. Concerns about whether the commitment includes sufficient types of GHGs and credible energy suppliers can be addressed by carefully scrutinizing the terms of a commitment. However, no current mechanism provides assurance that the commitment will be fulfilled in the future. The lack of a robust regulatory framework hinders the development of a separating equilibrium because, under current regulatory conditions, greenwashers pay no more to signal a false commitment than true green firms pay to signal a genuine commitment. In this situation, regulators, investors, civil society advocates, and the public cannot distinguish between a false climate pledge and a genuine one. This informational failure also undermines incentives for firms to issue high-quality pledges.

B. Private Commitment Devices for Enforcing Climate Pledges

We propose two novel incentive-compatible commitment instruments that can facilitate the emergence of a separating equilibrium in the climate pledges market. These costly-signaling instruments will enable true green firms to credibly distinguish themselves from greenwashers regarding their climate commitments. The instruments also will be a valuable tool for regulators, green investors, and civil society members who currently find it difficult to make this distinction.

The main concern with contemporary climate pledge practice is that it allows firms to reap reputational benefits ex ante by frontloading the benefits of their future climate actions without facing appropriate penalties ex post if they fail to fulfill their promises (and incur the associated mitigation costs). As we have discussed above, this involves an enforcement problem, a temporal problem, and a discovery-informational problem. The enforcement problem arises from the fact that climate pledgers face no penalty for a failure to meet their commitments. The temporal problem arises because the commitment is

123. Mark E. Laidre et al., *Animal Signals*, 23 CURRENT BIOLOGY R829, R832 (2013).

124. Thomas P. Lyon et al., *The Means and Ends of Greenwash,* 28 ORGANIZATION & ENVIRO. 223, 226 (2015).

125. Brian L. Connolly et al., *Signaling Theory: A Review & Assessment,* 37 J. OF MGMT. 39, 43 (2011); Fabrizio Erbini, *CSR Initiatives as Marketing Signals: A Review and Research Agenda,* J. OF BUS. ETHICS 1 (2015).

made today but will not be performed for a decade or more. The discovery-informational problem arises from the fact that companies that have incentives to make genuine commitments cannot credibly distinguish themselves from those that do not, and external stakeholders who have incentives to expand the number of genuine climate commitments, such as investors, customers, and regulators, cannot distinguish between the types of firms.

The instruments we propose address all three of these problems. They enable companies to make credible and enforceable long-term commitments. By attaching a cost to these commitments, they can serve as a "discovery tool" to help lenders, investors, and business players with aligned objectives find each other.[126] Further, by enabling green lenders and investors to link with climate-responsible companies, our instruments also could lower the costs of raising pro-climate funding.[127] Our instruments thus carry two potential advantages for companies that could justify the extra costs of entering into them: general reputational benefits and better access to green funding.

As to the temporal commitment-compliance mismatch underpinning the current climate pledge practice, our instruments address this problem by creating compliance instruments that will come into effect concurrently with the climate pledge. The core idea is simple: as part of its climate reduction pledge, the company will also create a non-revocable carbon future commitment in which it commits to purchase and retire carbon credits in the amount of the difference between its accumulated carbon reduction target and what it has achieved in practice.[128] To ensure a significant contribution to the climate crisis, the target should be articulated in accumulated reduction units (an aggregated target for the selected period) and not as an end-of-period percentage measure (percentage reduction relative to baseline) due to the importance of cumulative emissions.[129] In other words, since GHG emissions start contributing to global warming the moment they enter the atmosphere, reductions made a decade from now are less valuable than emissions reductions made now. Therefore, the non-revocable carbon future commitment should not allow companies to delay their GHG

126. A recent OECD report has highlighted the increasing demand by green investors for assurances that the money they invest generate positive environmental impact; OECD REPORT, *supra* note 26, at 8.

127. *Id.* at 9.

128. Offset credit holders must "retire" carbon offset credits to use them towards a GHG reduction goal. Retirement occurs according to a process specified by each carbon offset program's registry. Once an offset credit is retired, it cannot be transferred or used, meaning it is effectively taken out of circulation. For an overview of carbon offsetting techniques, *see* D. BROEKHOFF ET AL., SECURING CLIMATE BENEFIT: A GUIDE TO USING CARBON OFFSETS, STOCKHOLM ENVIRONMENT INSTITUTE & GREENHOUSE GAS MANAGEMENT INSTITUTE (2019)*;* TASKFORCE ON SCALING VOLUNTARY CARBON MARKETS, FINAL REPORT (Jan. 2021), at 32-38, https://www.iif.com/Portals/1/Files/TSVCM_Report.pdf; CHRISTOPHER BLAUFELDER ET AL., A BLUEPRINT FOR SCALING VOLUNTARY CARBON MARKETS TO MEET THE CLIMATE CHALLENGE, MCKINSEY (Jan. 29, 2019), https://www.mckinsey.com/business-functions/sustainability/our-insights/a-blueprint-for-scaling-voluntary-carbon-markets-to-meet-the-climate-challenge; *Understanding Carbon Offsets*, CARBON OFFSET GUIDE, https://www.offsetguide.org/understanding-carbon-offsets/ (last visited Jan. 21, 2024).

129. Articulating the target just in terms of a percentage reduction relative to a base line can allow the company, at least theoretically, to leave most of its reduction efforts to the end of the commitment period, which would mean larger accumulated emissions. Currently most of the companies articulate their targets in percentage terms and not as accumulated measures. *See* EXPERT REPORT, *supra* note 4, at 1.

emissions reductions. Although other authors have noted the problem of a potential gap between firms' promises and actual performance, they have not offered specific instruments through which corporations could credibly commit ex-ante to close the gap between commitments and performance.[130]

Our two proposed instruments effectuate a non-revocable carbon removal future contract that commits the pledging company to buy carbon credits to compensate for a potential future gap between its commitment and actual performance.[131] The instruments we propose provide the company with incentives to abide by its commitment[132] and ensure that the climate target embedded in the pledge is achieved (whether through emission reductions performed by the company or through the purchase and retirement of high-quality carbon offsets).

The instruments we propose are close in their structure to a forward or futures contract. A commodity futures contract "is an agreement to buy (or sell) a specified quantity of a commodity at a future date, at a price agreed upon when entering into the contract—the futures price."[133] Two types of futures contracts should be distinguished. A *forward contract* is a customized contractual

130. Thus, for example, Shelly Welton has argued that corporations should contribute to a global climate fund at a level "commensurate" with their remaining emissions. This fund could support socially, politically, and ecologically sound carbon removal strategies across the planet. Welton does not develop an instrument that could commit the corporations, ex ante, to make these contributions later if they find that they fail to reach their emission reduction goal. *See* Welton*, supra* note 8, at 241. John Armour, Luca Enriques, and Thom Wetzer also discussed this problem in 2021. They proposed an instrument for making carbon reduction commitments credible, which they term a "green pill." Their idea is that the firm should give a binding undertaking to make a payment conditional on non-fulfilment of its green commitment. They do not develop the details of their potential green pill other than through a general reference to existing instruments such as sustainability-linked bonds. *See* John Armour, Luca Enriques & Thom Wetzer, *Corporate Carbon Reduction Pledges: Beyond Greenwashing*, FACULTY OF LAW BLOGS UNIV. OF OXFORD (July 2, 2021), https://blogs.law.ox.ac.uk/business-law-blog/blog/2021/07/corporate-carbon-reduction-pledges-beyond-greenwashing. Albert Lin has noted that "a wide variety of contractual mechanisms—including loan agreements, development agreements, and settlements—could be crafted to encourage net zero implementation," and has noted the existence of sustainability linked bonds that peg a borrower's interest rate to whether the company achieves a specified sustainability goal, but he has not proposed any instruments that can perform these functions. *See* Lin, *supra* note 11, at 726. We go beyond the arguments of these authors by developing truly novel commitment devices that do not exist yet in the financial markets.

131. We draw on the definition of carbon credit in the Integrity Council for the Voluntary Carbon Market draft Core Carbon Principles (CCPs), Assessment Framework and Assessment Procedure, Part 5, Terms and Definitions: "Carbon Credit: A tradable financial instrument that is issued by a carbon-crediting program. A carbon credit represents a greenhouse gas emission reduction to, or removal from, the atmosphere equivalent to one metric tonne of carbon dioxide equivalent, calculated as the difference in emissions from a baseline scenario to a project scenario. Carbon credits are uniquely serialized, issued, tracked, and retired or administratively cancelled by means of an electronic registry operated by an administrative body, such as a carbon-crediting program." INTEGRITY COUNCIL FOR THE VOLUNTARY CARBON MARKET, PART 2: CORE PRINCIPLES (July 2022), https://icvcm.org/wp-content/uploads/2022/07/ICVCM-Public-Consultation-FINAL-Part-2.pdf.

132. A properly designed CFC should provide the company with an optimal incentive to reduce its emissions. The company will reduce its emissions to the extent that its internal (marginal) reduction costs are lower than the market (or contractually determined) cost of carbon credit.

133. Gary Gorton & K. Geert Rouwenhorst, *Facts and Fantasies About Commodity Futures,* 62 FINANCIAL ANALYSTS J. 47, 68 (2006). An interesting comparison can be made between these with the rules of the Commodity Futures Trading Commission. *Basics of Futures Trading,* COMMODITY FUTURES TRADING COMM. https://www.cftc.gov/LearnAndProtect/AdvisoriesAndArticles/FuturesMarketBasics/index.htm (last visited Jan. 22, 2024).

agreement through which two private parties agree to trade a particular asset with each other at an agreed specific price and time in the future. Forward contracts are traded privately over the counter, not on an exchange. A *futures contract* is a standardized version of a forward contract that is publicly traded on a futures exchange.

Another difference between the two contracts is that the parties in a forward contract make no payments until the contract's maturity, whereas in futures contracts, the exchanges mark positions to market by settling contract gains and losses daily.[134] In both forward and futures contracts, both the price and the quantity of the commodity are pre-specified. However, in our case, the quantity of the offsets that must be purchased is contingent on the size of the gap between the pledger's commitment and its future performance, while the price for settling the gap can be fixed in the contract.[135] The instruments we propose are closer to a forward contract than a futures contract because they are based on a customized contract and no payment will be made until the contract reaches maturity.[136]

1. A Carbon Letter of Credit (CarbonLC)

a. The Contractual Structure of a CarbonLC

The first instrument draws on the structure of a letter of credit (LC) to create a novel, irrevocable future climate commitment. LCs are useful for our purposes because they provide a framework for constructing a future-oriented and irrevocable contract. LCs were developed as an instrument to resolve the lack of trust between the parties to a transaction, and they are a common feature of international transactions.[137] An LC is an irrevocable promise by a bank (the "issuing bank") on behalf of a party that requests the credit (the "applicant") to make a specified payment to a third party (the "beneficiary"), provided that the beneficiary submits certain stipulated documents by a predetermined deadline.[138] A basic aspect of an LC is the notion of a "complying presentation": the issuing bank will only be obliged to make the payment to the third party if the bank is presented with documents in accordance with the terms and conditions of the credit. In essence, an LC addresses the problems of time and enforcement in commercial transactions by creating a parallel mechanism that ensures that the seller receives payment for the goods or services it sold through a third party that will undertake an irrevocable commitment to pay him if presented with

134. Lisa Meulbroek, *A Comparison of Forward and Futures Prices of an Interest-Rate Sensitive Financial Asset,* 47 J. OF FINANCE 381, 381 (1992).

135. As we elaborate below there are various options for determining the price, which enable the parties to hedge their exposure to the volatility of the carbon market.

136. *Cf.* Joanne P. Braithwaite, *Standard Form Contracts as Translational Law: Evidence from the Derivatives Markets,* 75 MODERN L. REV. 779, 794 (2012).

137. Gao Xiang & Ross P. Buckley, *The Unique Jurisprudence of Letters of Credit: Its Origin and Source*s, 4 SAN DIEGO INT'L L.J. 91, 96 (2003).

138. This definition is based on the Uniform Customs and Practice for Documentary Credits ('UCP 600'). *See* INT'L CHAMBER OF COMMERCE, ICC UNIFORM CUSTOMS AND PRACTICE FOR DOCUMENTARY CREDITS PUBLICATION No. 500 (rev. 2007) ('UCP 600'), art. 2.

documents that demonstrate that the seller has delivered the goods or services in accordance with the terms of the underlying contract.

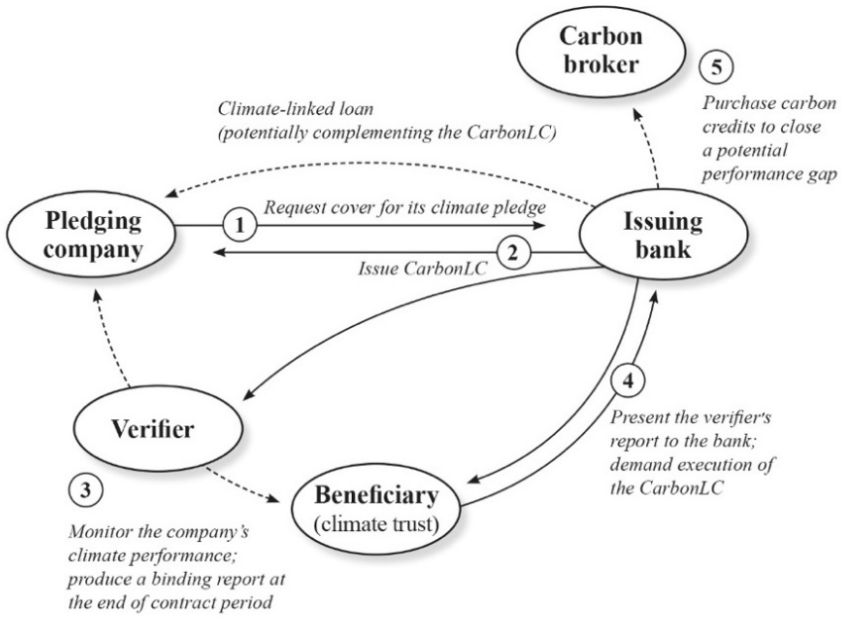
We draw on these aspects of LCs to address the barriers that the problems of time, enforcement, and discovery create for creating credible climate commitments. Drawing on the structure of an LC, we propose a climate pledge forward contract with the following structure (which we term "CarbonLC"). We anticipate that the issuance of a CarbonLC will form part of a broader financial transaction in which the bank will also provide funding for climate-mitigation projects initiated by the firm, although the broader loan is not necessary for the functioning of our CarbonLC.[139] A corporation (the applicant) will sign a CarbonLC with an issuing bank, according to which the bank will commit to purchase at the end of the contract carbon credits in an amount equal to the difference between the pre-determined carbon reduction target and the actual accumulated emissions reductions achieved by the firm. The bank will contract with a carbon credit broker to facilitate the purchase and retirement of the carbon credits (this contract can form part of the total CarbonLC transaction).[140] The contract can also specify the quality standard for the carbon offsets that may need to be purchased by the bank.[141] Figure 1 elaborates on the contractual structure of a CarbonLC.

139. *See infra* Part III.B(2) for further elaboration of this new type of loan.

140. Si Chen et al., *Carbon Offsets: An Empirical Market Study*, OPEN SOURCE STRATEGIES at 8 (Dec. 9, 2021), available at: https://ssrn.com/abstract=3981914; Eric Nowak, *Voluntary Carbon Markets*, SIX White Paper (Mar. 15, 2022), at 8 https://ssrn.com/abstract=4127136; Laurens Swinkels & Jieun Yang, *Investing in Carbon Credits*, 26 J. OF ALTERNATIVE INVESTMENTS 28, 34 (2023). For an example of the services provided by carbon broker see *About Us,* CARBON CREDIT CAPITAL https://carboncreditcapital.com/about-us/, (last visited Jan. 22, 2024); *see also Frequently Asked Questions,* RUBICON CARBON SERVICES, https://rubiconcarbon.com/faq (last visited Jan. 22, 2024). Another possibility is to use AirCarbon Exchange (ACX), which is a new initiative that tries to reduce the transaction costs involved in the trade of voluntary carbon offsets and allows its members to retire the underlying carbon credits through their ACX account. *A Digital Exchange Focused on Eliminating Market Friction in a Carbon Constrained Economy,* AIRCARBON EXCHANGE, https://www.aircarbon.co/ (last visited Jan. 22, 2024).

141. For a list of possible standards, *see Carbon Offset Standards,* CARBON FOOTPRINT, https://www.carbonfootprint.com/offsetstandards.html#:~:text=This%20standard%20was%20developed%20by,Voluntary%20Carbon%20Units%20(VCUs) (last visited Jan. 4, 2023). For an overview *see* ROSALIE ARENDT ET AL., CARBON OFFSETS: AN LCA PERSPECTIVE, IN PROGRESS IN LIFE CYCLE ASSESSMENT 2019 190 (2021).

Figure 1: Carbon Letter of Credit (CarbonLC)



The CarbonLC will also nominate a beneficiary with the right under the contract to force the bank to abide by that commitment (preventing potential collusion between the bank and the pledger and providing a credible third-party enforcer for the climate commitment). The CarbonLC will identify the documents that must be provided to the bank to trigger the purchase of carbon credits. The beneficiary should submit these, relying on the determination of an expert third party (verifier). The verifier also will be identified in the CarbonLC. Notably, the requirement for independent and external verification of the company's environmental performance can already be found in sustainability finance standards such as the Loan Syndications and Trading Association (LSTA) Principles.[142]

The beneficiary could be any reputable climate organization likely to remain active for an extended period. SBTi is a good example of an organization with the expertise and incentives to enforce these CarbonLC instruments. Still, the experience with land trusts that enforce conservation easements demonstrates that many organizations can perform this function and be responsible for

142. *Sustainability-Linked Loan Principles: Supporting Environmentally and Socially Sustainable Economic Activity*, LOAN SYNDICATIONS AND TRADING ASSOCIATION 4 (Feb. 2023), https://www.lsta.org/content/sustainability-linked-loan-principles-sllp/ [hereinafter LSTA PRINCIPLES] (saying "[b]orrowers must obtain independent and external verification of the borrower's performance level against each SPT [Sustainability Performance Targets] for each KPI [Key Performance Indicators] for any date/period relevant for assessing the SPT performance leading to a potential adjustment of the SLL economic characteristics, until after the last SPT trigger event of the loan has been reached").

commitments that extend over many decades.[143] The CarbonLC will thus consist of four or five parties: the pledger (the company or applicant), the issuing bank, a beneficiary, a verifier, and potentially a carbon broker through which the purchase of carbon credits will be implemented if necessary at the end of the commitment period.

As the CarbonLC reaches maturity and to the extent that the company has failed to meet its accumulated emissions reduction target, the beneficiary will present to the bank documents showing the existence of a gap (the documents must comply with the technical requirements of the CarbonLC).[144] The bank will then purchase and retire carbon credits in an amount equal to the gap. The CarbonLC can also allow the company to make the purchase itself within a specified period.

b. Aligning the Parties' Incentives

It is important to elaborate on the financial structure of a CarbonLC, which is critical to its commercial viability and environmental efficacy. We start with the question of the length of a CarbonLC. Most of the climate pledges issued by companies today designate 2040 or 2050[145] as their net-zero emissions target, although some companies that participate in the SBTi framework adopt shorter time-horizons such as 2030.[146] What would be a feasible time horizon for a CarbonLC? Forward contracts typically have a maturity date of one to ten years.[147] Corporate green energy purchase agreements (PPAs) also tend to be signed for ten to fifteen years.[148] CarbonLCs can support long-term commitments; however, we believe that at first, they should be used for shorter periods of ten years until we gain more experience in how to use them.

CarbonLCs can present several risks to the issuing bank. To understand these risks, consider the following stylized example: a firm approaches a bank with a request to issue a CarbonLC to cover its interim carbon accumulated reduction target of one million CO2 metric ton equivalent (often expressed as

143. *See* KEITH HIROKAWA & JESSICA OWLEY, LAW DISRUPTED 142-144 (2021) (discussing role of land trusts in enforcing conservation easements over long periods of time). For a discussion of how NGOs perform a stewardship role, *see generally* Emily Barritt, *Conceptualising Stewardship in Environmental Law*, 26 J. ENV'T L. 1 (2014).

144. Because of the deep uncertainties involved in making predictions for long-term emissions reductions, we assume that the CarbonLC will include a margin of error, stipulating that the company will not breach its commitment if its performance remains within the agreed margins.

145. 2040 is the target date used by the Climate Pledge initiative, *see Be the Planet's Turning Point,* THE CLIMATE PLEDGE https://www.theclimatepledge.com/ (last visited Jan. 22, 2024).

146. *See, e.g.*, SBTI, *Case Study – JAB,* SCIENCE BASED TARGETS, https://sciencebasedtargets.org/companies-taking-action/case-studies/case-study-jab (last visited Jan. 22, 2024).

147. *See* Benjamin Cheng et al., *Pricing of Long-Dated Commodity Derivatives: Do Stochastic Interest Rates Matter,* 95 J. OF BANKING & FINANCE 148, 148 (2016) (noting, e.g., that "[t]he maturities of the crude oil futures contracts and the options on futures contracts have extended from 18 months in 1990 to over 9 years in recent years").

148. WORLD BUSINESS COUNCIL FOR SUSTAINABLE DEVELOPMENT, CORPORATE RENEWABLE POWER PURCHASE AGREEMENTS: SCALING UP GLOBALLY 15 (2016), http://docs.wbcsd.org/2016/10/Scaling_up_globally.pdf [hereinafter SCALING UP] ("Corporate PPAs for new built projects are typically for a duration of 10+ years, so they act as a long-term hedge to counter price volatility.").

"CO2e") in a ten-year period.[149] The first risk the bank faces is a default risk equal to the full accumulated emissions the firm has committed to reducing. In this instance, the bank's total exposure, assuming, for example, that the price of carbon credit is $50 per metric ton, would be $50,000,000 (one million tons x $50 per ton). The second risk concerns future fluctuations in the price of carbon credits. It is hard to predict the trajectory of the future prices of carbon credits, since the price is a function of multiple factors, including global and national climate policies, climate events, and the state of the global economy.[150]

Banks can employ several measures to cope with these risks. It is important at the outset to emphasize the insurance nature of the CarbonLC, which provides coverage for the risk of non-compliance by the pledging firm. The issuing bank should therefore be concerned with the expected risk of non-compliance, not its total exposure. To ascertain and minimize this risk, as well as to protect itself, the bank can take several steps before entering into a CarbonLC contract. First, the bank can conduct a financial and environmental risk assessment, focusing on the following risk factors: (1) the firm's capacity to achieve its target based on a mitigation plan the firm will submit to the bank; (2) the firm's credit rating;151 and (3) future changes in the price of carbon credits. Second, the bank can take several steps to reduce risk by drawing on the risk assessment. First, the bank can charge a commission fee, whose size can vary according to the bank's evaluation of non-compliance risk (in conventional LCs, the fee usually ranges from 0.25 to 2.0 percent of the transaction's value).[152] Second, the bank can require collateral to cover its exposure under the CarbonLC contract. The size and nature of the collateral will be determined by the quality of the firm's mitigation plan and its credit rating, which together determine the probability that the firm will be able to meet its emissions target.[153] In most cases, the bank will require the applicant (the pledger) to provide collateral covering only a portion of its total exposure. Third, the bank can introduce a provision capping its maximal exposure (e.g., limiting its exposure to some percentage of the overall accumulated reduction target).

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149. For examples of actual climate pledges, see discussion at note 1. For instance, Nestle's total emissions (scope 1, 2 & 3) in 2018 were 113 Million tonnes of CO_2 (out of which 94.8 percent were scope 3), and it has committed to halve its GHG emissions by 2030 and to achieve net zero by 2050. See NESTLE, *supra* note 1, at 6. Vodafone's scope 1 & 2 emissions in 2021 were 1.42 Million tonnes of CO_2e, and it has committed to reduce these emissions to 'net zero' by 2030. See VODAFONE, *supra* note 1, at 42.

150. Thus, for example, a recent World Bank Report noted that "[f]ollowing years of limited growth, carbon prices rose quickly in 2021. Prices in carbon taxes and ETSs alike hit record levels across multiple jurisdictions, driven by more ambitious climate policies, as well as broader economic factors such as global energy commodity prices." WORLD BANK, STATE AND TRENDS OF CARBON PRICING 2022 15 (2022), https://openknowledge.worldbank.org/handle/10986/37455.

151. A*s reflected for example in its bond rating. See, e.g.,* Corporate Bonds Rating, MOODY'S, https://www.moodys.com/credit-ratings/Corporate-Bonds-credit-rating-400000167 (last visited Jan. 22, 2024). *But see generally* Ed DeHaan, *The Financial Crisis & Corporate Credit Ratings,* 92 ACCOUNTING REV 161 (2017) (critiquing rating agencies).

152. *See, e.g., Letter of Credit—Guide on Types, Process, Example,* LENDINGKART, https://www.lendingkart.com/business-loans/letter-of-credit/ (last visited Jan. 22, 2024).

153. For an overview of corporate debt structure *see generally* Paolo Colla et al., *Debt Structure,* 12 ANNUAL REV. OF FINANCIAL ECONOMICS 193 (2020).

Fourth, the bank can take several steps to cope with the risk of fluctuations in the price of carbon credits. One option is to fix the price of carbon credits to the date the CarbonLC contract was issued, either by using a particular carbon market as an anchor or by determining a specific price.[154] We do not recommend this approach because it can generate a moral hazard problem if the price of credits increases (we elaborate on the moral hazard problem in the next subpart). Another approach, which is used in PPAs, is to link the initial price to some index (e.g., to a particular carbon exchange such as the California Carbon Offset Futures or the E.U. Exchange Trading System (ETS)). This link would make future price fluctuations more determinate and therefore easier to assess and manage. These measures should provide adequate protection for the bank while also assuring that the contract can cover a determinate amount of carbon credits.[155] Finally, as an extra-contractual measure, if the bank issues several CarbonLC contracts, it could hedge the risk of future changes in carbon prices by purchasing some amount of carbon credits or a financial instrument linked to the price of carbon.

c. Potential Challenges

A challenge arising from the concept of a CarbonLC is the moral hazard problem. "Moral hazard" describes a situation where insurance perversely incentivizes actors to engage in risky behavior or to abstain from making an optimal precautionary investment.[156] Because the CarbonLC offers insurance against a failure by the company to meet its carbon target, it may disincentivize the company from taking actions to reduce its emissions, causing it to rely instead on the CarbonLC guarantee to compensate for any future performance gap through the purchase of carbon credits. The climate mitigation value of "original" reductions (undertaken by the company itself) is widely believed to be higher than the value of carbon offsets (in other words, it is better on balance for a company to reduce its emissions than to pay others to do so). Thus, we suggest

154. For the E.U. ETS, *see EU Emissions Trading System (EU ETS),* EUROPEAN COMMISSION, https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets_en (last visited Jan. 22, 2024). For the overall diversity *see Carbon Pricing Dashboard,* THE WORLD BANK, https://carbonpricingdash board.worldbank.org/map_data (last visited Jan. 22, 2024) (displaying the World Bank carbon pricing dashboard). *See also* Russell Nichols, *Why It's So Hard to Put a Price on Carbon*, TIME (Oct. 25, 2022), https://time.com/6213485/carbon-pricing-challenges-climate-change/.

155. *See* SCALING UP, *supra* note 148 at 15; Simon Baines et al., *#HowToPPA: An Examination of the Regulatory and Commercial Challenges and Opportunities Arising in the Context of Private Power Purchase Agreements for Renewable Energy,* 57 ALTA. L. REV. 389, 404 (2019) (noting that "[b]y providing that the contract price will increase or decrease over time in correlation to a corresponding increase or decrease in a publicly available index or market price (such as the Consumer Price Index (CPI), which is a common choice for such provisions), the risk of a PPA being significantly off-market for a prolonged period can be greatly mitigated").

156. Shivi Chen et al., *New Evidence of Moral Hazard: Environmental Liability Insurance and Firms' Environmental Performance,* 89 J. OF RISK & INSURANCE, 581, 582 (2022); Katelyn Tsipiras, & Will J. Grant., *What do We Mean When We Talk About the Moral Hazard of Geoengineering?,* 24 ENVIRO. L. REV. 27, 28 (2022).

several measures that can be incorporated into the CarbonLC to incentivize the company to prefer in-house reduction.

The first measure we propose provides a mixture of financial carrots and sticks that are contingent on the corporation's climate performance. A positive incentive can be created by automatically adjusting, on a yearly basis (or other agreed interval), the size of the collateral backing the CarbonLC based on the firm's climate performance in the preceding year. For instance, if the firm successfully reduces its emissions according to its mitigation plan, the issuing bank can release part of the collateral. To facilitate the adjustment process, the applicant company would need to back the CarbonLC with multiple collateral items (which can be of different types) that can jointly provide the bank with the appropriate security.[157] Firms have an incentive to limit the use of secured debt, since pledging assets up-front is costly. Pledging assets creates opportunity costs, which reflect the loss of collateral capacity that the firm may use during a liquidity crisis. Pledging of assets also imposes operational costs, reflecting that pledging a collateral limits the firm's flexibility to sell or redeploy assets. Although secured creditors might be willing to permit value-enhancing redeployment of their collateral, the necessary contractual modifications might take time, and creditors will want to be paid for agreeing to them.[158] Companies would therefore have an incentive to reduce their emissions rather than rely on the CarbonLC if reducing emissions could free their collateralized assets.

A somewhat similar instrument was developed in bank debt contracts, linking the interest charged on a bank loan to the borrower's financial performance (e.g., measured by its credit rating or by financial ratios such as debt-to-EBITDA).[159] Recently, the same logic was extended to sustainability-linked loans ("SLL") in which the loan's terms (primarily interest rate) are linked to the firm's environmental performance.[160] Similarly, we propose to link the collateral size to the bank's climate mitigation performance.

The case in which a company fails to meet its mitigation plans is more complex. We suggest structuring the transaction so that when the company lags

157. For more information on the practice of using multiple types of collateral to back corporate debt, *see* H. Degryse et al., *How Do Laws and Institutions Affect Recovery Rates for Collateral?* 9 *Rev. of Corp. Finance Studies* 1, 25 n.21; 33 (2022); C. Calomiris et al., *How Collateral Laws Shape Lending and Sector Activities,* 123 J. OF FINANCIAL ECONOMICS 163, 167 (2017). The financial sector has developed sophisticated instruments through which lenders can manage their collateral pool that could enable the commercial implementation of the instrument we propose. *See generally* DELOITTE, A BALANCING ACT: THE COLLATERAL CHALLENGE FOR CAPITAL MARKETS FIRMS (2017), https://www2.deloitte.com/content/dam/Deloitte/uk/Documents/financial-services/deloitte-uk-centre-for-regulatory-strategy-emea-capital-markets-collateral-report.pdf.

158. Efraim Benmelech et al., NATIONAL BUREAU OF ECONOMIC RESEARCH, THE DECLINE OF SECURED DEBT 3 (2020); Steven L. Schwarcz, *The Easy Case for the Priority of Secured Claims in Bankruptcy,* 47 DUKE L.J. 425, 431 (1997).

159. Paul Asquith, Anne Beatty & Joseph Weber, *Performance Pricing in Bank Debt Contracts*, 40 J. OF ACCOUNTING & ECONOMICS 101, 102 (2005).

160. *See* LSTA PRINCIPLES, *supra* note 142, section 1. The standards were developed by the Loan Syndications and Trading Association (LSTA). Recently BlackRock reached an agreement with a group of banks that pegs BlackRock's lending costs to its ability to achieve certain ESG targets. *See* Dawn Lim, *BlackRock Must Hit ESG Targets or Pay More to Borrow Money*, WALL ST. J. (Apr. 7, 2021).

significantly behind its planned reduction trajectory, the bank can require it to submit a revised mitigation plan and provide additional collateral. If the company fails to submit a satisfactory revised plan or continues to lag behind its projected commitments, the bank can close the CarbonLC contract by purchasing a pre-determined amount of carbon credits. Such a failure would also carry significant negative reputational consequences for the company.

Another option for dealing with the moral hazard problem could arise if the CarbonLC contract is issued as part of a broader financial transaction in which the bank also provides the company with climate-dedicated funding. In such a case, the bank can align the company's mitigation performance to the interest rate paid on the loan. The dramatic increase in the use of SLLs, accompanied by the development of dedicated loan principles, suggests that such a novel reorientation of SLLs would be commercially feasible.[161]

2. Climate Pledge Green Bonds

Another approach to creating a credible carbon future commitment is to incorporate the commitment into a specially designed green bond. We call this instrument a Climate Pledge Green Bond (CPGB). The International Capital Markets Association (ICMA), an NGO that serves as a trade association and private regulator of capital markets organizations, defines green bonds as any type of bond instrument "where the proceeds will be exclusively applied to finance or re-finance, in part or in full, new and/or existing eligible Green Projects . . . and which [are] aligned with the four core components of the [GBP]."[162] A green bond thus includes both a financial and an environmental commitment. We propose developing a unique type of green bond that includes a commitment to reducing carbon emissions. Our proposed instrument could either operate as a new type (stand-alone) green bond or as a component added to the standard provisions in generic green bonds regarding the use of the bond's proceeds for particular projects. Although our proposed climate pledge bond goes beyond current practice in the green bond market, it is compatible with the two standards governing green bonds: the Green Bond Principles (GBP) created by ICMA and the Climate Bond Standard (CBS) Version 3.0 created by the Climate Bonds Initiative (CBI).[163]

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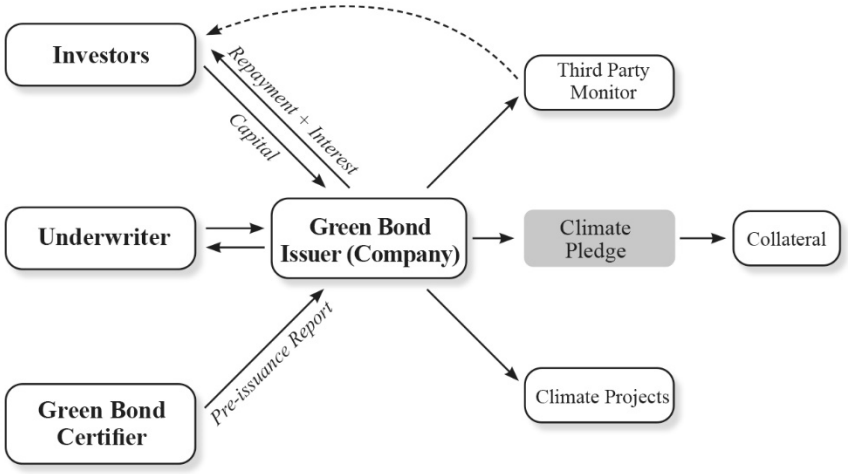
161. *See generally* LSTA PRINCIPLES, *supra* note 142; Richard Carrizosa & Al Ghosh, *Sustainability-Linked Loan Contracting* (Oct. 29, 2022), https://ssrn.com/abstract=4103883 (noting that the dramatic increase in the total deal amount of sustainability-linked loans over the recent years indicating a noticeable shift in ESG awareness and in the willingness of borrowers and lenders to contract on sustainability metrics). For instance, the total deal amount of sustainability-linked loans in 2018 was $4.15 billion. This number increased to $20.39 billion in 2020. The total deal amount of sustainability-linked loans in 2021 jumped to nearly $160.46 billion. *Id.* at 47.

162. CLIMATE BONDS INITIATIVE, CLIMATE BOND STANDARD 3.0 2 (2022), https://www.climatebonds.net/files/files/climate-bonds-standard-v3-20191210.pdf [hereinafter CBS STANDARD]. For a review of the private governance of green bond, *see generally* Stephen Kim Park, *Investors as Regulators: Green Bonds and the Governance Challenges of the Sustainable Finance Revolution*, 54 STAN. J. INT'L. L. 1 (2018).

163. *See* CBS STANDARD, *supra* note 162. The CBS adopted the definition of a green bond mentioned above. *See* Park, *supra* note 162, at 8. Version 4 was released for public comments on

An irrevocable future commitment can be incorporated into a green bond in at least two ways. The first is to include a commitment to sign a CarbonLC as part of the bond's covenants. A second option is to incorporate a climate mitigation plan into the green bond, which would also include a commitment to purchase carbon credits in the amount of the difference between the firm's accumulated carbon reduction target and its actual performance. Both the GBP and the CBS recognize climate mitigation as an eligible green project.[164] The main problem underpinning this option is how to incorporate an automatic compliance mechanism within the bond that would have the same effect as a CarbonLC. The fact that the issuer (the company) retains control of implementing the environmental aspects of the bond creates a compliance challenge. Figure 2 illustrates the financial structure of the CPGB.

Figure 2: Climate Pledge Green Bond



We propose incorporating several compliance instruments into our proposed CPGB to respond to the risk of non-compliance. The first instrument builds on the governance framework established by the GBP and CBS, which consists of both auditing and reporting obligations. Jointly, these obligations provide a strong deterrence against a breach of the issuer's emissions reductions plan.

September 6, 2022. *Climate Bonds Standard 4.0,* CLIM. BONDS INITIATIVE, https://www.climatebonds.net/climate-bonds-standard-v4 (last visited Jan. 22, 2024).

164. *See Guidelines for Green, Social, Sustainability and Sustainability-Linked Bonds External Reviews*, INTERNATIONAL CAPITAL MARKET ASSOCIATION 4 (June 2021), https://www.icmagroup.org/assets/documents/Sustainable-finance/2021-updates/Green-Bond-Principles-June-2021-140621.pdf [hereinafter GBP STANDARD]; CBS STANDARD, *supra* note 162, at 7. The CBS goes even further by requiring the issuer to provide a "statement on the climate-related objectives of the Bond" and by noting that "emissions reductions" can be among the climate-related objectives nominated by the issuer. CBS STANDARD, *supra* note 162, at 13.

The GBP recommends that issuers use an external auditor or other third party to verify the internal tracking and the allocation of funds from the Green Bond proceeds to eligible Green Projects. ICMA developed a specific standard, Guidelines for External Reviews, to guide the work of external reviewers.[165] The Guidelines distinguish between three levels of auditing: second-party opinion, verification, and certification by third parties such as the Climate Bonds Initiative (CBI). To be credible, our CPGB should be externally verified or certified. The ICMA Guidelines define the ICMA verification requirement as follows:[166] "An issuer can (or "needs to" in the case of sustainability-linked bonds post-issuance) obtain independent verification against a designated set of criteria, typically about environmental/social/sustainability or KPI [Key Performance Indicators] performance and sustainability targets for the SLBs [Sustainability-Linked Bond]." In contrast, the CBI provides a stricter framework for third-party verification in which issuers need to be certified both pre- and post-issuance according to the CBS standard.[167] As part of the certification process, certified climate bonds must be checked by an Approved Verifier, which provides a formal assurance report.[168]

To address reporting concerns, the ICMA developed a detailed Harmonised Framework for Impact Reporting,[169] which guides issuers on how to report on the use of the Green Bond's proceeds. Issuers must provide a list of the projects to which proceeds have been allocated and a brief description of the projects and their expected impact. The Harmonised Framework offers impact reporting metrics, sector specific guidance for project categories, and reporting templates. For example, under the renewable energy category, the issuer must report on "[a]nnual GHG emissions reduced/avoided in tonnes of CO2 equivalent."[170] The Framework also includes a template that can be used for these reports.[171] Similarly, the CBI requires issuers, after the post-issuance verification is completed and confirmed, to provide annual reports to the Climate Bonds Secretariat throughout the term of the bond. When possible, these annual reports will be published on the CBI website.[172] The ICMA and CBI auditing and reporting frameworks can be applied to our CPGB, requiring the issuer to monitor its progress and publish externally verified annual reports, describing its mitigation performance against the targets set in the pledge.

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165. *See* GBP STANDARD, *supra* note 164.

166. *Id.* at 3.

167. CBS STANDARD, *supra* note 162.

168. For a directory of verifier organizations, which have been approved by the Climate Bonds Standard Board, *see Approved Verifiers Under the Climate Bonds Standard,* CLIMATE BONDS INITIATIVE, https://www.climatebonds.net/certification/approved-verifiers (last visited Jan. 24, 2024).

169. *See generally Handbook: Harmonised Framework for Impact Reporting June 2023*, INTERNATIONAL CAPITAL MARKET ASSOCIATION (2023), https://www.icmagroup.org/assets/documents/Sustainable-finance/2023-updates/Handbook-Harmonised-framework-for-impact-reporting-June-2023-220623.pdf.

170. *Id.* at 13.

171. *Id*. at 53.

172. *See Climate Bonds Certification,* CLIMATE BONDS INITIATIVE, https://www.climatebonds.net/certification/get-certified#reporting (last visited Jan. 24, 2024) (the CBI's standard for reporting).

However, this governance framework does not offer a solution to a situation in which the issuing company fails to achieve its target. Such failure can be due to an explicit company decision (e.g., due to moral hazard considerations), unforeseen operational or technological difficulties, financial distress, or insolvency. The key to resolving this risk is to clearly separate between the financial and climate mitigation obligations underlying our CPGB.

To deal with the risk of non-compliance, a CPGB should include distinctive, earmarked collateral that would cover the purchase of carbon credits if the bond issuer failed to deliver on the promised reduction target. This collateral would be exclusively designated to cover the pledge risk, and the bondholders would not be able to use it to recover their debt in the case of financial default. The exact size of the collateral would have to be agreed upon ex ante between the issuers and the debtholders, drawing on a risk-assessment process like the one discussed in the context of a CarbonLC. Adding this collateral turns the green bond into a securitized instrument in which the bondholders, as the indirect beneficiaries of the climate pledge, are given priority over other stakeholders.[173] The option of issuing a securitized green bond is recognized by both the GBP and CBS.[174] Adding a future-compliance element into the green bond framework also creates a carbon credit price risk, and we suggest using the same mixture of solutions (carbon cap and link to a particular index) that we developed in the case of CarbonLC.

Incorporating a future-compliance element into our CPGB creates a moral hazard problem similar to the one we encountered in the case of a CarbonLC. We propose to respond to that risk with a similar mixture of financial carrots and sticks. The first measure we would like to suggest draws on the concept of "Sustainability Linked Bonds" (SLBs). Although SLBs were not developed to deal with the risks associated with a CPGB, they can be adapted to our purposes. SLBs are defined in the Sustainability Linked Bond Principles (SLBP)[175] as "any type of bond instrument for which the financial and/or structural characteristics can vary depending on whether the issuer achieves predefined Sustainability/ESG objectives." The SLBP state that the most common feature of the bond that can be linked to the firm's performance is the coupon (the annual interest rate paid on a bond), but it is also possible to consider the variation of other financial or structural characteristics of the bond.[176] To incentivize the issuer to satisfy its mitigation commitments, our CPGB could incorporate a flexible collateral instrument, whose size can be adjusted annually in line with

173. *See also* Steven L. Schwarcz, *Rethinking Corporate Governance for a Bondholder Financed, Systemically Risky World*, 58 WM. & MARY L. REV. 1345, 1352 (2017). *Bonds that are* secured by specific collateral assets of the issuer are called *c*overed bonds. *See* Steven L. Schwarcz, *The Conundrum of Covered Bonds,* 66 BUS. L. 561, 562 (2010); *Moody's Approach to Rating Covered Bonds*, MOODY'S (Nov. 28, 2022), https://ratings.moodys.com/api/rmc-documents/396015.

174. *See* GBP STANDARD, *supra* note 164, at 8; CBS STANDARD, *supra* note 162, at 29.

175. LSTA PRINCIPLES, *supra* note 142, at 1.

176. *Id.* section 5.

the corporation's mitigation achievements, or could link the interest charged on the bond to the firm's climate performance.[177]

a. Discussion, Extension, and Objections

The instruments we propose will enable truly sustainable firms to distinguish themselves from greenwashers by issuing credible climate pledges (backed by one of our instruments), leading to a separating equilibrium. The emergence of a separating equilibrium is related to the differential cost structure underpinning our proposed instruments. The cost of issuing a CarbonLC or a Climate Pledge Green Bond would be much higher for greenwashers than for sustainable firms. The reason is that banks, investors, and underwriters are likely to charge higher fees and interest rates from greenwashers than from truly green firms due to the higher risk of non-compliance.

A potential objection to our proposal is that the cost of issuing a CarbonLC or a CPGB would be too high and would require the pledging corporation to commit excessive assets as additional collateral, undermining the ability of the company to invest in climate-mitigation actions. This critique misunderstands the insurance aspect of our instruments. The collateral the pledging firm provides does not need to cover the total carbon exposure underpinning the CarbonLC or the CPGB, but rather the expected risk of non-compliance. The pledging company can undertake various measures to reduce this risk, enabling it to provide the issuing bank or the debtors with less collateral. For example, the CarbonLC can be signed as part of a broader financial deal, including an SLL that will assure the bank that the company is financially committed to reducing its emissions. Alternatively, the company can prove that it has signed a long-term renewable energy supply contract.[178]

By providing pledging companies with an incentive to reduce their emissions in compliance with their climate pledge, our proposed instruments resolve the main difficulty in contemporary climate pledges: "the disconnect between increasing carbon-related reduction announcements or declarations on one side, and tangible climate action or concrete internal institutional measures on the other."[179] The proposed instruments increase corporate incentives to make and implement climate commitments by addressing the problems of enforcement, time, and discovery. Stakeholders will know that firms that back their pledges by a CarbonLC or a CPGB have a financial incentive to honor their commitments. If they fail, there is a credible alternative in the form of equivalent offset purchase. The instruments we propose could also increase funding

177. Floating rate bonds have been extensively used in the financial markets, but instead of linking the rate to ecological benchmarks, they are usually linked to financial ones such as the U.S. Treasury note rate, the Federal Reserve funds rate, known as the Fed funds rate, or the London Interbank Offered Rate (LIBOR), to link it to the firm's mitigation progress. *See* Michael Faulkender, *Lending or Market Timing? Selecting the Interest Rate Exposure of Corporate Debt,* 60 J. OF FINANCE 931, 931-934 (2005).

178. *See Green Power Procurement Considerations*, EPA, https://www.epa.gov/green-power-markets/green-power-procurement-considerations (last visited April 28, 2023).

179. In & Schumacher, *supra* note 6, at 15.

opportunities for green companies by helping investors and businesses with aligned commitments find each other through credible signaling.[180]

Although our focus is on addressing the problems of enforcement, time, and discovery, our proposal also can address the problem of ambiguous pledges. Advocacy groups and scholars have noted that the complexity of climate change mitigation can enable companies to make commitments that have negligible effects on climate mitigation.[181] Commitments that pledge net zero emissions by 2050 may look good on the surface, but may deliver minimal actual emissions reductions if they fail to establish clear and ambitious near-term targets, exclude important types of GHGs or scope 3 (supply chain) emissions, or rest largely on the purchase of low-quality offsets.

Both of our proposed instruments require the pledger to develop a detailed and clear mitigation plan, and the plan could be subject to third-party verification. Such clarity will be critical for assessing whether a gap exists between the pledge target and the company's performance (in terms of achieved accumulated reductions). Neither the bank issuing a CarbonLC nor the underwriter agent organizing the issuance of a CPGB will agree to support an ambiguous pledge that could expose them to litigation risks arising from disputes between the parties involved in the transaction.

A potential additional challenge concerns the possibility that our proposed instruments will legitimize unambitious pledges. A similar problem can arise if the compliance framework of the CarbonLC or the CPGB results in inadequate monitoring of the performance of the pledging company (and consequently fails to detect a possible gap between the pledge and the performance). Although these concerns are not without merit, as the recent Verra scandal demonstrates,[182] we believe that our scheme, which brings together financial institutions, environmental NGOs that function as trustees, and third-party verifiers, provides the required incentives to ensure that transactions that do not deliver significant environmental value will be screened out. The experience with land trusts is instructive on this point: although important failures have occurred and raised concerns about genuine land conservation deals, the system has protected millions of acres of forests and agricultural land without using the resources or coercion of governments.[183]

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180. OECD REPORT, *supra* note 26, at 32.

181. *See, e.g.*, *Revealed: more than 90% of rainforest carbon offsets by biggest certifier are worthless, analysis shows*, THE GUARDIAN (June 18, 2023), https://www.theguardian.com/environment/2023/jan/18/revealed-forest-carbon-offsets-biggest-provider-worthless-verra-aoe (summarizing a report as concluding that "more than 90% of rainforest carbon offsets by biggest certifier are worthless"). The report, which includes strong criticism of Verra, the world's leading carbon credit certifier, has led to the resignation of Verra's chief executive officer, David Antonioli. *See CEO of biggest carbon credit certifier to resign after claims offsets worthless*, THE GUARDIAN (May 23, 2023), https://www.theguardian.com/environment/2023/may/23/ceo-of-worlds-biggest-carbon-credit-provider-says-he-is-resigning.

182. *See Revealed: more than 90% of rainforest carbon offsets by biggest certifier are worthless, analysis shows*, THE GUARDIAN (June 18, 2023), https://www.theguardian.com/environment/2023/jan/18/revealed-forest-carbon-offsets-biggest-provider-worthless-verra-aoe.

183. *See* sources cited *supra* note 143.

A final advantage of our proposed instruments is that they provide companies with a credible option to abide by emerging regulatory obligations. Thus, for example, the proposed SEC rules require companies to provide information about any climate-related targets or goals they have set (e.g., about reducing GHG emissions or energy usage). The proposed rules also include far-reaching obligations regarding compliance with their climate pledges. They require a registrant company to disclose relevant data to indicate whether it is making progress toward achieving the target or goal and how such progress has been achieved.[184] A registrant would be required to update this disclosure each fiscal year by describing the actions taken during the year to achieve its targets or goals. Participation in one of our proposed instruments will buttress regulatory incentives to comply with these requirements, and even if the SEC waters down these requirements in its final rule, private governance regimes such as SBTi will continue to create incentives for these types of actions.

Similarly, the new E.U. Empowering Consumers Directive will prohibit companies from making claims regarding their future climate performance unless they are supported by clear, objective, and verifiable commitments and targets given by the company.[185] Our proposed instruments thus provide a credible path for companies to comply with the provisions of these new standards for climate action.[186] The recent lawsuit against Delta, which attacked as "false and misleading" its carbon neutrality claim, illustrates why companies might find our instruments attractive.[187]

A final concern has been raised by Shelley Welton and others: even if corporations' climate commitments are credible, will they undermine the development of a more comprehensive and effective government response to climate change?[188] We agree that greenwashing could lead to the public or policy makers believing that the private sector is solving problems, which it is in fact not solving, and this could undermine support for government action without delivering the promised GHG emissions reductions. Corporate commitments and other forms of private sector action also could lead to a more balkanized governance landscape. These are real risks. This critique is less convincing, however, when it is directed to climate commitments that are substantial and are fulfilled. Is it possible that even if credible corporate climate commitments lead

184. *See* SEC Proposed Climate Disclosure Rule, *supra* note 71 at 21,471.

185. Empowering Consumers Directive, *supra* note 60, at 18. For a discussion of bondholder monitoring techniques, *see generally* Stephen Kim Park*, Green Bonds and Beyond: Debt Financing as a Sustainability Driver*, CAMBRIDGE HANDBOOK OF CORPORATE LAW, CORPORATE GOVERNANCE AND SUSTAINABILITY (2019).

186. The proposed instruments are also unlikely to contravene directors' fiduciary duties. *See* Armour et al., *supra* note 130.

187. *Delta Air Lines faces lawsuit over $1bn carbon neutrality claim*, THE GUARDIAN (May 30, 2023), https://www.theguardian.com/environment/2023/may/30/delta-air-lines-lawsuit-carbon-neutrality-aoe?.

188. *See, e.g.*, Welton, *supra* note 8, at 176 (characterizing climate change mitigation that relies in part on corporate carbon neutrality commitments as a "strategy which may ultimately result in irreconcilable plans that exacerbate other development challenges while underachieving on a global scale").

to major emissions reductions, they will displace even greater reductions that would otherwise have resulted from government climate mitigation measures? It is possible but seems highly unlikely given the absence of evidence that private actions discourage public actions and the slow pace of government climate efforts in the United States and around the world.

Although some reduction in public support is possible because of a perception that the private sector has solved the problem, two factors reduce the likelihood that a reduction in public support will lead to a net reduction in climate mitigation efforts. First, to date, many private initiatives and organizations have filled gaps after decades of government inaction. In many cases, these private efforts have played what the Environmental Defense Fund, a leading NGO, describes as a proof-of-concept role: identifying what works and providing an intellectual and organizational infrastructure for later development of government measures, rather than discouraging them.[189]

A recent example is private governance initiatives' role in providing the organizational and intellectual foundation for federal climate mitigation efforts. For instance, the 2022 draft SEC climate disclosure rule draws heavily on the WRI/WBCSD GHG Protocol, a private standard providing detailed GHG emissions accounting guidelines, and the CDP (formerly the Carbon Disclosure Project) carbon disclosure platform. Similarly, the U.S. federal government is the largest buyer of goods and services in the world, with a total annual expenditure in the range of $630 billion, and several federal agencies have proposed a major new regulation designed to reduce the GHG emissions from suppliers to the federal procurement. The proposed rule explicitly incorporates compliance with the GHG Protocol, CDP disclosure, and SBTi tracking of emissions reductions commitments and performance into the standards that companies must follow when contracting with the federal government.[190]

Second, the psychology of opposition to climate change mitigation is complex and the spillover effects of learning about public or private climate mitigation initiatives are difficult to predict, but it is clear that the effects can be positive or negative.[191] Research suggests that learning about private sector action often does not affect support for public sector action; in fact, it is as likely to increase support for public action as to decrease it.[192] For instance, research suggests that rejection of climate science often arises from solution aversion: opposition to climate action based on a dislike of government responses.[193] This

189. *See, e.g.*, *Jake Hiller*, EDF, https://www.edf.org/people/jake-hiller (last visited Jan. 31, 2024) (describing a current private sector project as "developing principles for sustainable investment in fisheries and catalyzing proof-of-concept deals with EDF's Oceans program").

190. *See* Federal Acquisition Regulation: Disclosure of Greenhouse Gas Emissions and Climate-Related Financial Risk, 87 Fed. Reg. 68,312 (2022).

191. *See* Heather B. Truelove, Amanda R. Carrico & Elke U. Weber et al., *Positive and Negative Spillover of Pro-environmental Behavior: An Integrative Review and Theoretical Framework*, 29 GLOBAL ENVIRONMENTAL CHANGE 127, 127-28 (2014).

192. *See id* at 129.

193. *See* Troy H. Campbell & Aaron C. Kay, *Solution Aversion: On the Relation Between Ideology and Motivated Disbelief*, 107 J. PERSONALITY & SOC. PSYCHOL. 809, 810-11 (2014).

research also suggests that exposure to private sector responses to climate change, such as credible climate commitments, can address solution aversion, resulting in increased support for all types of climate mitigation measures.[194]

CONCLUSION

In this Article, we proposed two new financial instruments, a Carbon LOC and CPGB, which can address greenwashing concerns regarding corporate climate commitments. These financial instruments can enable climate-leading companies to make credible and binding carbon reduction commitments and distinguish themselves from greenwashers. By facilitating the emergence of a separating equilibrium in the climate pledge market, they could also help investors and businesses with aligned objectives find each other, thus increasing funding opportunities for truly sustainable firms. Further, they also provide a way for making corporations accountable for their public statements, responding in this way to an important critique of climate justice activists. Finally, they can provide a credible path for companies to satisfy the requirements of emerging, stricter government climate requirements.

Although we developed the proposed instruments to facilitate credible corporate climate commitments, many other organizations, including universities, medical centers, religious and civic organizations, and even state and local governments have made unenforceable climate commitments. Some of these organizations may be motivated to use our two forward contracts that can make climate commitments credible. So long as they can enter into these types of contracts, the contracts may be a viable option for them.

In addition, many other types of issues raise the problems of enforcement, time, and discovery that our instruments are designed to address, and our instruments can be adapted to facilitate credible future commitments on a wide range of non-climate topics. So long as an instrument can identify a third party with an incentive to enforce the agreement and something that can be purchased to account for any shortfall in the organization's actions, our basic model should provide a viable approach. For instance, a company or other organization may want to gain the benefits of a credible commitment to achieve a long-term goal on biodiversity, with the funds from the instrument used to fund reforestation or other actions that promote biodiversity. Another topic that these types of instruments can address is environmental justice. A firm pledging to achieve levels of pollution reduction in fenceline communities or levels of hiring in poor communities could combine the pledge with an instrument committing it to finance equivalent actions that would fill gaps between its commitment and its performance. In fact, most job creation pledges could be subject to an instrument modeled on or basic design.

194. *See* Ash Gillis, Michael P. Vandenbergh & Kaitlin Toner Raimi et al., *Convincing Conservatives: Private Sector Action Can Bolster Support for Climate Change Mitigation in the United States,* 73 ENERGY RESEARCH & SOCIAL SCIENCE 101947, 101948 (2021).

In a world where international and national climate mitigation panaceas are unavailable, making climate commitments stick may be one of the most important tools available to address the threat of climate change. Our two proposed financial instruments are viable ways to achieve that goal even if governments are slow to act. As noted above, using financial instruments to enable corporations and other organizations to make credible commitments could also be applied to other areas where commitments to achieve future goals are an important part of the response to difficult social, health, or environmental problems.