

ZEROING IN ON NET-ZERO: FROM SOFT LAW TO HARD LAW IN CORPORATE CLIMATE CHANGE PLEDGES

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One hundred and ninety-seven nations endorsed a target of net-zero greenhouse gas (GHG) emissions by midcentury in the 2021 Glasgow Climate Pact. As countries around the world have begun to develop their plans for deep decarbonization, it has become evident that the private sector will need to deliver much of what is required for the transition to an environmentally sustainable economy. The commitment to net-zero emissions by the year 2050 has therefore cascaded to the corporate world, leading hundreds of major companies to make their own net-zero GHG pledges. What constitutes a meaningful net-zero corporate pledge, however, remains unclear—and what must be done to implement these commitments remains similarly opaque. In the absence of regulatory mandates, corporate pledges could become little more than empty optimism and may harm companies' reputations if perceived to be greenwashing. But while governments have long dithered, other stakeholders—notably investors, consumers, NGOs, and the media—are scrutinizing corporate net-zero commitments and pressing companies to explain their climate strategies, business transformation intentions, investment plans, and reporting schedules in search of credible metrics, methodologies, and interim targets.

This Article explains why the scramble to make sense of corporate net-zero emissions targets matters—arguing that these pledges may emerge as a critical point of leverage in the effort to transition toward a sustainable economy, especially

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in the absence of comprehensive government climate change policies. It provides an analytical framework to highlight what net-zero pledges could—and should—mean. It identifies key considerations and challenges that must be addressed in corporate GHG reduction strategies. And it documents how stakeholder demands for more robust disclosure regarding corporate net-zero pledges, as part of a broader push for more rigorous Environmental, Social, and Governance performance reporting, might establish de facto global climate change rules for major companies—creating a self-regulatory “soft law” structure of emissions reduction guidelines and incentives anticipating future regulation and government action.

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INTRODUCTION

Hardly a day goes by without another major company pledging to step up to the challenge of *deep decarbonization*, often with some sort of commitment to *net-zero greenhouse gas (GHG) emissions*.¹ While some companies see the looming transition to a clean energy economy and a sustainable future as a threat, many others see an opportunity. What was once a trickle of net-zero commitments became a flood in the run-up to the 2021 Conference of the Parties to the Paris Agreement (COP26) in Glasgow²—providing a clear signal that many corporate leaders recognize the *sustainability imperative* facing the business world.³ As Sir Nicholas Stern, Professor of Economics and Government at the London School of Economics and Political Science, recently observed, this transition “represents not a cost or a burden but the greatest economic, business, and commercial opportunities in modern times.”⁴ However, while some of the world’s largest companies have taken up this opportunity and made significant commitments to

1. “Deep decarbonization” refers to the process of removing GHG-intensive processes from the global economy—which is what will be required broadly to meet the 2050 net-zero GHG target established by the 2021 Glasgow Climate Pact. For an example of what “deep decarbonization” entails, see SUSTAINABLE DEV. SOLS. NETWORK, AMERICA’S ZERO CARBON ACTION PLAN (2020), <https://irp-cdn.multiscreensite.com/6f2c9f57/files/uploaded/zero-carbon-action-plan%20%281%29.pdf> [<https://perma.cc/8MRV-8BR5>] [hereinafter AMERICA’S ZERO CARBON ACTION PLAN].

2. See generally Conference of the Parties Serving as the Meeting of the Parties to the Paris Agreement, *Report of the Conference of the Parties Serving as the Meeting of the Parties to the Paris Agreement on its Third Session, Held in Glasgow from 31 October to 13 November 2021*, U.N. Doc. FCCC/PA/CMA/2021/10/Add.1 (Mar. 8, 2022) [hereinafter Glasgow Climate Pact].

3. The “sustainability imperative” refers to the need for executives to address how “the challenge of sustainability will profoundly affect the competitiveness—and perhaps even the survival—of their organizations.” David A. Lubin & Daniel C. Esty, *The Sustainability Imperative*, HARV. BUS. REV., May 2010, <https://hbr.org/2010/05/the-sustainability-imperative> [<https://perma.cc/DC68-ZXRG>].

4. NICHOLAS STERN, LONDON SCH. OF ECON. & POL. SCI., G7 LEADERSHIP FOR SUSTAINABLE, RESILIENT AND INCLUSIVE ECONOMIC OPPORTUNITY AND GROWTH: AN INDEPENDENT REPORT REQUESTED BY THE UK PRIME MINISTER FOR THE G7, at 2 (2021), <https://www.lse.ac.uk/granthaminstitute/publication/g7-leadership-for-sustainable-resilient-and-inclusive-economic-recovery-and-growth> [<https://perma.cc/F42D-KKH5>].

regear their business models for a low-carbon future, others are slower to take action.⁵ And even for those that have made commitments, the breadth and depth of the pledges vary significantly.⁶

To fulfill the 2015 Paris Agreement's objectives—notably, a sharp reduction in carbon dioxide (CO₂) emissions and other GHGs to keep increases in global average temperature below 1.5 degrees Celsius⁷—the Intergovernmental Panel on Climate Change (IPCC) has indicated that broad GHG reductions are required on an accelerated time schedule.⁸ The IPCC, taking stock of the most recent scientific consensus, estimates that the global economy must reduce GHG emissions to a net-zero level by no later than 2050—ensuring that whatever residual GHG emissions continue will be fully offset by GHGs *removed* from the atmosphere.⁹ As the IPCC's *Special Report: Global Warming of 1.5°C* makes clear, a necessary condition to achieving this goal is a swift and permanent shift in the global economy's energy foundation from nonrenewable, fossil fuel-based power to clean, renewable sources.¹⁰ But while this energy transition is *necessary*, it is not *sufficient*—“rapid and far-reaching transitions in . . . land, urban and infrastructure (including transport and buildings), and industrial systems” are also required.¹¹

The International Energy Agency (IEA) has modeled the path required for such far-reaching transitions. It suggests, for example, that no new fossil fuel extraction should be permitted *as of today* and that, after 2035, no new cars with internal combustion engines should be brought to market.¹² A range of

5. *One Year On: One Year On, Rapid Growth of Race to Zero Shows that Halving Emissions by 2030 Is the New Normal*, RACE TO RESILIENCE (June 15, 2021), <https://racetozero.unfccc.int/one-year-in> [<https://perma.cc/W3BP-ALNZ>].

6. NEWCLIMATE INST. ET AL., NET ZERO STOCKTAKE 2022 (2022) [hereinafter NET ZERO STOCKTAKE 2022].

7. Conference of the Parties on Its Twenty-First Session, *Report of the Conference of the Parties on Its Twenty-First Session, Held in Paris from 30 November to 13 December 2015*, U.N. Doc. FCCC/CP/2015/10/Add.1 (Jan. 29, 2016).

8. WORKING GRP. I, IPCC, CLIMATE CHANGE 2021: THE PHYSICAL SCIENCE BASIS (2021) [hereinafter IPCC WG I].

9. WORKING GRP. III, IPCC, CLIMATE CHANGE 2022: MITIGATION OF CLIMATE CHANGE (2022) [hereinafter IPCC WG III].

10. IPCC, *SUMMARY FOR POLICYMAKERS, IN SPECIAL REPORT: GLOBAL WARMING OF 1.5°C* (2018) [hereinafter IPCC 1.5°C].

11. *Id.*

12. INT'L ENERGY AGENCY, NET ZERO BY 2050: A ROADMAP FOR THE GLOBAL ENERGY SECTOR (2021) [hereinafter IEA NET ZERO BY 2050].

other modeling efforts have come to similar conclusions about the need to move to a clean and renewable energy structure, with much greater emphasis on energy efficiency.¹³ These requirements have heightened the pressure on companies since business activities represent the lion's share of global GHG emissions.¹⁴ Indeed, it cannot be a surprise to anyone that success in achieving this scale of emissions reduction will require coordinated action between the private sector and governments—thus drawing business leaders from all sectors into the climate resilience quest.

Private-sector commitments to net-zero GHG targets have multiplied in response to the pressure for businesses to make the necessary changes. The U.N.-led *Race to Zero* campaign now has over two thousand corporate members, representing close to \$10 trillion in revenue.¹⁵ Oxford-based researchers report that over a fifth of the world's two thousand largest companies, representing \$14 trillion in revenues, have made commitments to reach net-zero targets of some sort.¹⁶ Similarly, the Science-Based Targets Initiative (SBTi)—a partnership including the U.N. Global Compact, CDP (formerly the Carbon Disclosure Project), World Resources Institute (WRI), and World Wide Fund for Nature (WWF)—counts among its members more than a thousand companies in fifty different business sectors across sixty countries committed to emissions reductions at the pace and scale required by climate science to meet the Paris Agreement goals.¹⁷

While being a part of a net-zero initiative may be indicative of a company's positive intentions or willingness to make changes, these commitments do not *guarantee* transformative change.¹⁸ In fact, the real test in the years ahead will be whether

13. See, e.g., AMERICA'S ZERO CARBON ACTION PLAN, *supra* note 1; see also NAT'L ACAD. SCI., ACCELERATING DECARBONIZATION IN THE UNITED STATES: TECHNOLOGY, POLICY, AND SOCIETAL DIMENSIONS (2021).

14. IPCC 1.5°C, *supra* note 10.

15. *Race to Zero Campaign*, U.N. CLIMATE CHANGE, <https://unfccc.int/climate-action/race-to-zero-campaign> [<https://perma.cc/2K3J-EK7B>] [hereinafter *Race to Zero*].

16. RICHARD BLACK ET AL., ENERGY & CLIMATE INTELL. UNIT & UNIV. OF OXFORD, TAKING STOCK: A GLOBAL ASSESSMENT OF NET ZERO TARGETS (2021).

17. HEIDI HUUSKO, STATUS REPORT: BUSINESS AMBITION FOR 1.5°C; RESPONDING TO THE CLIMATE CRISIS, SCI. BASED TARGETS INITIATIVE (2021).

18. See generally Anders Bjørn et al., *From the Paris Agreement to Corporate Climate Commitments: Evaluation of Seven Methods for Setting 'Science-Based' Emissions Targets*, 16 ENV'T RES. LETTERS, Apr. 2021,

the headline-grabbing initiatives—such as the Glasgow Financial Alliance for Net-Zero (GFANZ), which reports that over 550 signatory banks and other financial institutions have committed their collective \$130 trillion in assets to lending in alignment with the global community’s net-zero target—will deliver on the promises being made.¹⁹ With little to show to date from the financial world in terms of substantive emissions reductions, it is no wonder that skeptics abound.²⁰

Nevertheless, net-zero GHG emissions targets have become a touchstone for businesses of all sizes and in all sectors—and an inescapable expectation for corporate leaders looking forward. Corporate leaders *must* anticipate questions, and even pushback, from the investment world, the media, NGOs, and the broader public about their plans for reducing emissions. Companies seen as inadequately responsive might well be vulnerable to shareholder pressure, perhaps even in the form of activist investors.²¹ This prospect is not hypothetical. In fact, an activist hedge fund persuaded a majority of ExxonMobil shareholders in 2021 to reject three board candidates and, in their place, elect three candidates who promised to regear the company to address climate change.²² Likewise, Chevron shareholders voted in 2021 for a resolution calling on the company to include certain indirect GHG emissions associated with a company’s value chain (reflecting the consumption of fossil fuels by the company’s customers) as part of its future

<https://iopscience.iop.org/article/10.1088/1748-9326/abe57b>
[<https://perma.cc/Z4DR-2WFE>].

19. Tom Metcalf & Alex Morales, *Carney Unveils \$130 Trillion in Climate Finance Commitments*, BLOOMBERG, <https://www.bloomberg.com/news/articles/2021-11-02/carney-s-climate-alliance-crests-130-trillion-as-pledges-soar> [<https://perma.cc/U5KK-WSMD>] (Nov. 3, 2021, 5:55 AM).

20. Michael Northrop, *GFANZ Fails to Deliver at COP26*, ENV’T FIN. (Nov. 16, 2021), <https://www.environmental-finance.com/content/analysis/gfanz-fails-to-deliver-at-cop26.html> [<https://perma.cc/7WKE-7L8Z>]. For a legal critique, see generally Shelley Welton, *Neutralizing the Atmosphere*, 132 YALE L.J. 171 (2022).

21. See, e.g., Tim McDonnell, *Climate Activist Shareholders Are Finally Starting to Win*, QUARTZ (Feb. 9, 2022, 10:13 AM), <https://qz.com/2124167/climate-activist-shareholders-are-finally-starting-to-win> [<https://perma.cc/85SY-RHN5>]; see also Chris Matthews, *SEC Adopts Rule Giving Activist Investors More Power in Board Elections*, MARKETWATCH (Nov. 17, 2021, 11:01 AM), <https://www.marketwatch.com/story/sec-to-vote-on-rule-giving-activist-investors-more-power-in-board-elections-11637164892> [<https://perma.cc/BF9L-QQTF>].

22. Clifford Krauss, *Exxon Board to Get a Third Activist Pushing Clean Energy*, N.Y. TIMES, <https://www.nytimes.com/2021/06/02/business/exxon-board-clean-energy.html> [<https://perma.cc/D64N-FAVH>] (June 9, 2021).

climate change targets, thereby forcing Chevron's directors to take the prospect of a clean energy future much more seriously.²³

Recognizing the importance of private-sector climate change action but also the potential for empty promises, a number of groups and leaders are not waiting for governments to define the path forward. For example, the Institutional Investors Group on Climate Change (IIGCC) and U.N. Secretary General António Guterres have urged companies to go beyond merely committing to net-zero *target dates*, and instead specify the implementation details of their net-zero *strategies*.²⁴ A number of other NGOs and climate change initiatives, including the United Nations Framework Convention on Climate Change's (UNFCCC) *Race to Zero Campaign* and SBTi, have reinforced the need for concrete corporate action plans.²⁵

Some of the loudest voices demanding greater corporate focus on climate change have come from the investment world. While it is widely recognized that the world's transition to net-zero will cost trillions of dollars each year and will require the private sector to undertake large-scale investments, these costs are dwarfed by the costs of inaction.²⁶ As the latter becomes

23. Julian Lee, Opinion, *The Day the World Changed for Big Oil*, BLOOMBERG (May 29, 2021, 11:00 PM), <https://www.bloomberg.com/opinion/articles/2021-05-30/exxon-shell-chevron-saw-the-world-change-for-big-oil-emissions> [<https://perma.cc/HC8H-PSTX>].

24. See *Investor Practices Programme*, INSTITUTIONAL INVS. GRP. ON CLIMATE CHANGE, <https://www.iigcc.org> [<https://perma.cc/JEY2-2Q3Z>]; Tom Metcalf, *Policing of Net-Zero Claims to Take Shape in 2022*, UN Chief Says, BLOOMBERG (Nov. 11, 2021, 3:46 PM), <https://www.bloomberg.com/news/articles/2021-11-11/policing-of-net-zero-claims-to-take-shape-in-2022-un-chief-says> [<https://perma.cc/79QA-PUWG>].

25. See, e.g., ALBERTO CARRILLO PINEDA ET AL., CDP, FOUNDATIONS FOR SCIENCE-BASED NET-ZERO TARGET SETTING IN THE CORPORATE SECTOR (2020); see also *Principles for Making a Net Zero Commitment*, OXFORD NET ZERO, <https://netzeroclimate.org/policies-for-net-zero/net-zero-principles> [<https://perma.cc/NMG4-CELX>]; CLIMATE ACTION 100+, CLIMATE ACTION 100+ NET-ZERO COMPANY BENCHMARK (2021); UNIV. OF CAMBRIDGE INST. FOR SUSTAINABILITY LEADERSHIP, TARGETING NET ZERO: A STRATEGIC FRAMEWORK FOR BUSINESS ACTION (2020); CÉSAR DUGAST, CARBONE4, NET ZERO INITIATIVE: A FRAMEWORK FOR COLLECTIVE CARBON NEUTRALITY (2020); EXPONENTIAL ROADMAP INITIATIVE, THE 1.5°C BUSINESS PLAYBOOK (2020).

26. See IPCC WG III, *supra* note 9; IPCC 1.5°C, *supra* note 10. See generally NICHOLAS STERN, THE ECONOMICS OF CLIMATE CHANGE: THE STERN REVIEW (2006); ERIC LARSON ET AL., PRINCETON UNIV. NET-ZERO AM., POTENTIAL PATHWAYS, INFRASTRUCTURE, AND IMPACTS: FINAL REPORT SUMMARY (2021); ENERGY TRANSMISSIONS COMM'N, MISSION POSSIBLE: REACHING NET-ZERO CARBON EMISSIONS FROM HARDER-TO-ABATE SECTORS BY MID-CENTURY (2018);

clearer, a growing segment of mainstream investors have made clear their interest in avoiding exposure to risk related to GHG-emissions and in better aligning their portfolios with their values.²⁷ Granular views of corporate deep decarbonization strategies emerge even more clearly among institutional investors and asset managers who prioritize long-term asset value and worry about stranded assets and future liability for the externalities (including climate change damage) of polluting industries.²⁸

But how significant are today's net-zero corporate pledges? What, exactly, are corporations committing to? Do the announced targets represent carefully developed goals? These questions have emerged as critical tests of the business community's commitment to a sustainable future in general and an appropriate response to climate change in particular.

This Article maps the terrain into which companies are now proceeding as they make net-zero GHG emissions pledges. It highlights the challenges that must be faced in meeting net-zero targets and identifies key considerations that meaningful commitments must address. We begin in Part I by reviewing the structure and nature of net-zero pledges. We then introduce a novel conceptual understanding of these pledges as an emerging area of *soft law*—largely defined and enforced, not by governments, but rather by interested stakeholders, most notably from the finance and investment world. In Part II, we catalogue the issues that companies will confront as they make emissions-reduction pledges, ranging from basic definitional questions to key details that any pledge needs to cover.

Finally, in Part III, we build on the issues catalogued in Part II and identify a set of best practices for corporations to follow in developing net-zero pledges. In addition, we highlight the developments in Environmental, Social, and Governance (ESG)

Swathi Nair, *Climate Inaction Costlier than Net Zero Transition: Reuters Poll*, REUTERS (Oct. 25, 2021, 1:16 AM), <https://www.reuters.com/business/cop/climate-inaction-costlier-than-net-zero-transition-economists-2021-10-25> [https://perma.cc/N5V2-KZ87].

27. See Madison Condon, *Externalities and the Common Owner*, 95 WASH. L. REV. 1 (2020); Daniel C. Esty & Todd Cort, *Sustainable Investing at a Turning Point*, in VALUES AT WORK: SUSTAINABLE INVESTING AND ESG REPORTING 3, 4–7 (Daniel C. Esty & Todd Cort eds., 2020); Eleonora Broccardo et al., *Exit vs. Voice* (Nat'l Bureau Econ. Rsch., Working Paper No. 27710, 2020).

28. Daniel C. Esty & David A. Lubin, *Toward a Next Generation of Corporate Sustainability Metrics*, in VALUES AT WORK: SUSTAINABLE INVESTING AND ESG REPORTING, *supra* note 27, at 98, 104.

reporting and the broader pressure for more structured metrics and data on corporate sustainability performance as leading catalysts for the development of the self-regulatory soft law structure discussed in this Article. We argue that a voluntary framework of corporate net-zero commitments could emerge as *the* fundamental near-term driver of movement toward a low-carbon future. Although we anticipate that this soft law structure could, and indeed should, *harden* into legal requirements over time, we recognize that the *current* absence of legal requirements in many jurisdictions requires careful consideration of how the soft law net-zero pledge regime develops. In that respect, our focus on best practices highlights a series of options that might well shape the contours of this regime moving forward.

I. NATURE AND STRUCTURE OF NET-ZERO GHG COMMITMENTS

While many countries have committed to emissions-reduction goals of their own, either in their nationally determined contributions (NDCs) to achieving the goals of the Paris Agreement or in their own domestic legislation,²⁹ these government pledges do not directly bind companies. Critics view this reality as a fundamental weakness of the global climate change regime.³⁰ But the lack of legal mandates highlights one of the most remarkable characteristics of the flurry of net-zero commitments being made by enterprises around the world: they are entirely *voluntary*. While these pledges do correspond to the objectives set by the Paris Agreement, as well as other nonbinding commitments made under international environmental law, no legal obligation presently exists *requiring* corporate action. Indeed, even the formal Glasgow Climate Pact commitment among nations to reach net-zero emission targets

29. Secretariat, U.N. Framework Convention on Climate Change, *Nationally Determined Contributions Under the Paris Agreement*, U.N. Doc. FCCC/PA/CMA/2021/8 (Sept. 17, 2021); Heleen L. van Soest et al., *Net-Zero Emission Targets for Major Emitting Countries Consistent with the Paris Agreement*, 12 NATURE COMMS. 2140 (2021).

30. See Clive L. Spash, *This Changes Nothing: The Paris Agreement to Ignore Reality*, 13 GLOBALIZATIONS 928 (2016); Robert Falkner, *The Paris Agreement and the New Logic of International Climate Politics*, 92 INT'L AFFS. 1107 (2016); Noah M. Sachs, *The Paris Agreement in the 2020s: Breakdown or Breakup?*, 46 ECOLOGY L.Q. 865 (2019).

by 2050 is simply a consensual reinterpretation of the Paris Agreement's key provisions.³¹

A. *Emerging Soft Law*

Net-zero corporate pledges must be understood as private-sector initiatives—or to be more precise, strategic choices made by individual companies and other nonstate actors such as universities—to commit to climate change action even in the absence of mandates.³² Because these pledges are not the result of government requirements, net-zero commitments represent self regulation in alignment with the perceived expectations of critical stakeholders, particularly investors, customers, and the citizenry more generally.

These private agreements do not have the same force (or enforceability) as legal obligations, of course, but they do provide a basis for evaluating corporate social responsibility. Moreover, the emerging expectations and guidelines concerning the elements of net-zero GHG pledges represent a type of self-regulatory soft law,³³ which could harden over time and become the basis for a regulatory scheme. This self-regulatory soft law is driven in large part by leaders in the finance world who increasingly demand data on the ESG performance of the companies that they might consider including in the investment portfolios they manage for their clients.³⁴ These investment managers are, as noted earlier, driven by the growing number of

31. Glasgow Climate Pact, *supra* note 2.

32. *Race to Zero*, *supra* note 15.

33. “Soft law” is a concept that has its roots in international law but has increasingly been used to describe extralegal obligations domestically *and* abroad. See Kenneth W. Abbott & Duncan Snidal, *Hard and Soft Law in International Governance*, 54 INT’L ORG. 421 (2000); Anna Di Robilant, *Genealogies of Soft Law*, 54 AM. J. COMP. L. 499, 499–500 (2006). Soft law “range[s] from treaties . . . to non-binding or voluntary resolutions and codes of conduct formulated and accepted by international and regional organisations . . . to statements prepared by individuals in a non-governmental capacity, but which purport to lay down international principles.” C. M. Chinkin, *The Challenge of Soft Law: Development and Change in International Law*, 38 INT’L & COMP. L.Q. 850, 851 (1989). In this case, the structure being established largely comes not from governments (as is the case with traditional international soft law), but rather from a loosely structured alliance of other actors.

34. Robert G. Eccles & Svetlana Klimenko, *The Investor Revolution: Shareholders Are Getting Serious About Sustainability*, HARV. BUS. REV., May–June 2019, at 106–16, <https://hbr.org/2019/05/the-investor-revolution> [<https://perma.cc/M7AF-SU99>].

sustainability-minded investors who are concerned about the ESG ratings of companies in their portfolios.³⁵

Similarly, institutional investors—in particular, those managing mutual funds, pension funds, or endowments and seeking to hold diversified investments on a medium- to long-term basis—have become increasingly concerned about ESG-related exposure and climate-related financial risks. Thus, they have become focused on reliably determining which companies and industries are positioning themselves for a low-carbon-risk future.³⁶ Coalitions, such as the IIGCC or Climate Action 100+, have been institutional investors' favorite vehicles to push for net-zero corporate pledges.³⁷ These coalitions have, in turn, adopted frameworks to shape net-zero corporate commitments and benchmarks to assess these pledges.³⁸

High-profile Wall Street figures have exerted additional pressure, declaring that companies that fail to address climate change present an unacceptable investment risk. For example, Larry Fink, CEO of BlackRock—the world's largest asset manager—has called on companies “to disclose a plan for how their business model will be compatible with a net zero economy” and “to disclose how this plan is incorporated into [their] long-term strategy and reviewed by [their] board of directors.”³⁹ BlackRock has likewise been pushing companies to report following the Task Force on Climate-related Financial Disclosure (TCFD) and Sustainability Accounting Standards Board (SASB) sustainability disclosure frameworks.⁴⁰

Institutional investors are not the only actors setting standards for net-zero corporate pledges. NGOs are scrutinizing net-zero commitments to ensure that they live up to society's expectations. The most successful framework in this respect has been developed by the SBTi, a venture of CDP, the U.N. Global

35. *Id.*

36. Condon, *supra* note 27.

37. See generally *Investor Signatories*, CLIMATE ACTION 100+, <https://www.climateaction100.org/whos-involved/investors> [<https://perma.cc/9RP5-SCHV>]; *Our Members*, INSTITUTIONAL INVS. GRP. ON CLIMATE CHANGE, <https://www.iigcc.org/about-us/our-members> [<https://perma.cc/7UAC-AW79>].

38. INSTITUTIONAL INVS. GRP. ON CLIMATE CHANGE ET AL., NET ZERO INVESTMENT FRAMEWORK 1.5° C: IMPLEMENTATION GUIDE (2021); CLIMATE ACTION 100+, *supra* note 25.

39. Larry Fink, *Larry Fink's 2021 Letter to CEOs*, BLACKROCK (2021), <https://www.blackrock.com/us/individual/2021-larry-fink-ceo-letter> [<https://perma.cc/Q3P2-VPD4>].

40. *Id.*

Compact, WRI, and WWF.⁴¹ Despite a noticeable lack of transparency in its methodology,⁴² SBTi has been widely assimilated by companies as the standard setter of decarbonization pledges.⁴³ Finally, companies themselves have engaged in a virtuous competition to augment climate ambition. The Amazon-led Climate Pledge has collected over three hundred signatures from businesses committing “to achieve net-zero annual carbon emissions by 2040.”⁴⁴

These different actors—all nongovernmental entities—are setting standards for net-zero commitments, establishing reporting frameworks, setting benchmarks, providing guidance, and issuing ESG disclosure methodologies. And some of these entities are self-consciously highlighting their own role in shaping marketplace expectations. For example, SBTi refers to its frame of reference for corporate net-zero commitments as “*the Net-Zero Standard*” (emphasis added),⁴⁵ demonstrating how these private actors are competing to define the norms for corporate net-zero commitments in the absence of a standardized regulatory system. Some of the momentum also derives from the desire of companies to be seen as good corporate citizens who are doing the right thing for society, as illustrated by the success of the “science-based” pledge structure of the SBTi to which thousands of companies have committed.⁴⁶ However,

41. SBTi, SCIENCE-BASED NET-ZERO: SCALING URGENT CORPORATE CLIMATE ACTION WORLDWIDE, ANNUAL PROGRESS REPORT (2021).

42. Camilla Hodgson, *Climate Targets Oversight Group Under Scrutiny over Its Own Governance*, FIN. TIMES (Feb. 1, 2022), <https://www.ft.com/content/75527cce-9748-4aec-b6e6-7c7828460d2a> [https://perma.cc/3RRQ-BES5].

43. Camilla Hodgson, *Science-Based Arbiter of Corporate Climate Targets Sets Out New Rules*, FIN. TIMES (Oct. 27, 2021) <https://www.ft.com/content/903a8476-3efd-49af-b012-193063e29194> [https://perma.cc/T4DE-3YJB]; Ed Ballard & Dieter Holger, *Rush of ‘Science-Based’ Climate Pledges Puts Pressure on Group That Checks Them*, WALL ST. J. (Nov. 11, 2021, 7:14 AM), <https://www.wsj.com/articles/rush-of-science-based-climate-pledges-puts-pressure-on-group-that-checks-them-11636632890> [https://perma.cc/9WV8-YPW7].

44. *Signatories*, CLIMATE PLEDGE, <https://www.theclimatepledge.com/us/en/Signatories> [https://perma.cc/C9D5-2ZLB] [hereinafter CLIMATE PLEDGE].

45. The SBTi *Net-Zero Standard* establishes four key elements of a corporate net-zero target: a near-term science-based target (SBT) (five to ten years), a long-term SBT (no later than 2050), mitigation beyond the value chain (e.g., direct air capture [DAC], geologic storage, and jurisdictional REDD+ credits), and neutralization of any residual emissions (through permanent removal and storage of carbon from the atmosphere). SBTi, SBTi CORPORATE NET-ZERO STANDARD: VERSION 1 (2021).

46. Hodgson, *supra* note 43.

perhaps more importantly, it is clear that institutional investors can, because of the power of the purse they carry, significantly influence companies.⁴⁷ This influence is so pervasive, in fact, that many companies do not even believe that they have a *choice* in signing on to net-zero GHG targets. Indeed, even ExxonMobil CEO Darren Woods, who mocked corporate climate goals in 2020 as a mere “beauty competition,”⁴⁸ was forced to shift gears. In 2022, ExxonMobil announced a net-zero GHG pledge, albeit one that solely focuses on its operations, after shareholders elected three directors committed to a clean energy transition.⁴⁹

The increasingly imperative nature of corporate GHG pledges and action can be traced to three factors. First, pressure for corporate GHG emissions reductions reflects a fundamental change in business thinking over recent years about a corporation’s core purpose—marked by a shift away from a belief that a company’s mission should center on delivering shareholder value to a belief that recognizes the interests of a broader set of *stakeholders*, including customers, suppliers, employees, and the communities in which an enterprise operates. In turning away from Milton Friedman’s doctrine of shareholder primacy,⁵⁰ many business leaders now believe that their companies need to be seen as good corporate citizens serving society broadly and not simply maximizing profits and shareholder value.⁵¹ In this regard, corporate net-zero GHG emissions pledges are now seen as a signal of a company’s seriousness about the *sustainability imperative* and as critical to an enterprise’s social license to operate.⁵²

47. See, e.g., Julie Cotter & Muftah M. Najah, *Institutional Investor Influence on Global Climate Change Disclosure Practices*, AUSTRALIAN J. MGMT. 37 (2012).

48. Kevin Crowley, *Exxon CEO Calls Rivals’ Climate Targets a ‘Beauty Competition’*, BLOOMBERG (Mar. 5, 2020), <https://www.bnnbloomberg.ca/exxon-ceo-calls-rivals-climate-targets-a-beauty-competition-1.1400957> [<https://perma.cc/Q7GQ-UC4Z>].

49. Reuters, *Exxon Pledges Net-Zero Carbon Emissions from Operations by 2050*, CNBC NEWS (Jan. 18, 2022, 8:14 AM), <https://www.cnbc.com/2022/01/18/exxon-pledges-net-zero-carbon-emissions-from-operations-by-2050.html> [<https://perma.cc/3ZRX-RRGX>].

50. MILTON FRIEDMAN, CAPITALISM AND FREEDOM 133–36 (1962) (advancing the theory that corporations have no higher purpose than maximizing profits for their shareholders).

51. Dan Esty, *Mastering the Labyrinth of Sustainability: Toward a New Foundation for the Market Economy*, REVUE EUROPÉENNE DU DROIT, Summer 2022, at 1; Lucian A. Bebchuk & Roberto Tallarita, *Will Corporations Deliver Value to All Stakeholders?*, 75 VAND. L. REV. 1031 (2022).

52. See Lubin & Esty, *supra* note 3.

Second, corporate net-zero pledges reflect a further social reality: the public expects private-sector leadership on climate change, especially in the absence of public-sector success in tackling the issue and moving society toward a sustainable future.⁵³ Governments across the world are struggling to develop serious strategies for deep decarbonization. Indeed, every analysis of the NDCs under the 2015 Paris Agreement reveals a sizeable gap between these commitments and the efforts needed to mitigate climate change.⁵⁴ Similarly, developed countries are nowhere near their 2009 pledge to provide \$100 billion in climate-oriented development aid.⁵⁵ By contrast, sustainability-oriented private finance has ramped up dramatically—illustrated by the commitments made by the Glasgow Financial Alliance for Net-Zero.

Third, private profits made at public expense are increasingly seen as suspect.⁵⁶ Thus, any company with a business model whose success depends on spillovers of harm on to society—whether air pollution from a smokestack, water effluent poured into a nearby river, or GHG emissions released into the atmosphere—faces growing questions and the threat of regulation.⁵⁷ As the push for an “end to externalities” gains steam, companies that fail to regear their business models are at risk.⁵⁸

53. DANIEL C. ESTY & ANDREW WINSTON, GREEN TO GOLD: HOW SMART COMPANIES USE ENVIRONMENTAL STRATEGY TO INNOVATE, CREATE VALUE, AND BUILD COMPETITIVE ADVANTAGE 8–11 (2009). *See generally* DANIEL C. ESTY & P.J. SIMMONS, THE GREEN TO GOLD BUSINESS PLAYBOOK: HOW TO IMPLEMENT SUSTAINABILITY PRACTICES FOR BOTTOM-LINE RESULTS IN EVERY BUSINESS FUNCTION (2011).

54. *See, e.g.*, Secretariat, U.N. Framework Convention on Climate Change Secretariat, Nationally Determined Contributions Under the Paris Agreement, U.N. Doc. FCCC/PA/CMA/2021/2 (Feb. 26, 2021).

55. Jocelyn Timperley, *The Broken \$100-Billion Promise of Climate Finance—And How to Fix It*, 598 NATURE 400 (2021).

56. *See, e.g.*, Press Release, H. Comm. Energy & Com., Pallone Demands Answers from Oil Companies on Record Breaking Profits Amid High Gas Prices (Aug. 3, 2022), <https://energycommerce.house.gov/newsroom/press-releases/pallone-demands-answers-from-oil-companies-on-record-breaking-profits-amid> [<https://perma.cc/NN6X-EX26>].

57. *See* Esty, *supra* note 51 (spelling out these challenges and the multiple lines of logic in support of a “no uncompensated spillovers of harm” rule).

58. Esty & Lubin, *supra* note 28; E. Donald Elliott & Daniel C. Esty, *The End Environmental Externalities Manifesto: A Rights-Based Foundation for Environmental Law*, 29 N.Y.U. ENV'T L.J. 505 (2021); Esty, *supra* note 51 (arguing for a reinvigorated commitment to the *polluter pays principle* and a prohibition on uninternalized environmental externalities).

B. Implications of Net-Zero Pledges

While some may see corporate net-zero pledges as meaningless in the absence of an enforceable regulatory framework,⁵⁹ such a view ignores how these commitments take on a life of their own. By committing voluntarily to climate action, companies are setting public expectations for themselves—for which they should expect to be held accountable—on a granular basis. We note that the mechanisms of accountability will not necessarily be the usual legal structures of environmental regulations although these traditional tools may be deployed in some jurisdictions.⁶⁰ But scrutiny by investors, customers, NGOs (including a growing number of self-proclaimed corporate watchdogs such as Carbon Trade Watch), the media, and the general public can be nearly as significant. Those who fall short of the expectations they have set should anticipate negative publicity,⁶¹ public criticism,⁶² hostility from environmental groups,⁶³ consumer boycotts,⁶⁴

59. See Welton, *supra* note 20; James Dyke et al., *Climate Scientists: Concept of Net Zero Is a Dangerous Trap*, CONVERSATION (Apr. 22, 2021, 12:25 AM), <https://theconversation.com/climate-scientists-concept-of-net-zero-is-a-dangerous-trap-157368> [<https://perma.cc/GT5M-DW5F>].

60. See *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, and the Committee of the Regions: 'Fit for 55'; Delivering the EU's 2030 Climate Target on the Way to Climate Neutrality*, COM (2021) 550 final (July 14, 2021).

61. See, e.g., Graham Readfearn, *Hundreds of Yoga Teachers Call Out Lululemon over Coal-Powered Factories*, GUARDIAN (Sept. 14, 2022), <https://www.theguardian.com/environment/2022/sep/14/hundreds-of-yoga-teachers-call-out-lululemon-over-coal-powered-factories> [<https://perma.cc/R7T3-9H2K>].

62. See, e.g., Damian Carrington, *Shell's Climate Poll on Twitter Backfires Spectacularly*, GUARDIAN (Nov. 3, 2020), <https://www.theguardian.com/business/2020/nov/03/shells-climate-poll-on-twitter-backfires-spectacularly> [<https://perma.cc/ZBY6-K5UV>].

63. Charlotte Owen-Burge, *Net Zero: The Good, the Bad and the Ugly*, RACE TO ZERO (June 28, 2021), <https://climatechampions.unfccc.int/net-zero-the-good-the-bad-and-the-ugly> [<https://perma.cc/M6UL-BRYG>].

64. John Glenday, *59% of Consumers Say They'll Boycott Brands that Don't Address Climate Emergency*, DRUM (Dec. 7, 2021), <https://www.thedrum.com/news/2021/12/07/59-consumers-say-they-ll-boycott-brands-don-t-address-climate-emergency> [<https://perma.cc/2UX8-AX7N>].

denouncement by climate-minded political leaders,⁶⁵ and investor short selling.⁶⁶

Corporate leaders making net-zero GHG commitments should therefore be prepared to reconfigure their business models for success as society moves to a low-carbon future and environmental externalities are fully internalized. Alignment with this new reality will require significant changes, not only in product design and production processes, but also in extraction methods, corporate supply chains, procurement, distribution channels, customer use of the service or product, and end-of-life disposal.⁶⁷ All of these elements will need to be explained in detail by those making serious net-zero pledges—because plans to undergird GHG pledges will be scrutinized by investors (and other stakeholders) seeking to identify which companies are poised for success in the face of the emerging sustainability imperative.

Of course, voluntary commitments can, by their very nature, be revised or even fully reneged by companies. And some businesses will undoubtedly choose not to follow through on some or all the commitments they have made, particularly if the corporate leadership changes or political pressure against sustainable investing mounts.⁶⁸ But there will be a price to pay for such defections. If promises made are not being kept,

65. Myles McCormick & Amanda Chu, *Oil Groups Accused of Climate Deceit in US Congress Grilling*, FIN. TIMES (Oct. 28, 2021), <https://www.ft.com/content/e3db1714-e34b-4228-99f3-35a53806f9cb> [<https://perma.cc/ZS67-6BML>].

66. Jessica Hamlin, *Investors Miss Out on Gains When They Avoid Short-Selling for ESG*, INSTITUTIONAL INV. (June 17, 2022), <https://www.institutionalinvestor.com/article/b1yhf65bcl589g/Investors-Miss-Out-on-Gains-When-They-Avoid-Short-Selling-for-ESG> [<https://perma.cc/7EYK-HKNJ>].

67. ANNE-TITIA BOVÉ & STEVEN SWARTZ, MCKINSEY & CO., *STARTING AT THE SOURCE: SUSTAINABILITY IN SUPPLY CHAINS* (2016) (estimating that supply chains account for “more than 80 percent of greenhouse-gas emissions and more than 90 percent of the impact on air, land, water, biodiversity, and geological resources”); ELLEN MCARTHUR FOUND., *COMPLETING THE PICTURE: HOW THE CIRCULAR ECONOMY TACKLES CLIMATE CHANGE* (2021 reprot.) (estimating that circular economy strategies are essential to reduce 45 percent of GHG emissions).

68. For example, Vanguard, the second largest fund manager in the world, recently withdrew from the Net Zero Asset Managers Initiative and the Glasgow Financial Alliance for Net-Zero in the face of political pushback from a number of U.S. state-level Republican attorneys general who questioned whether ESG investing could be justified under fiduciary duty standards. Elliot Gulliver-Needham, *Vanguard Quits Net-Zero Asset Managers Initiative*, INV. WEEK (Dec. 8, 2022), <https://www.investmentweek.co.uk/news/4061376/vanguard-quits-net-zero-asset-managers-initiative> [<https://perma.cc/ZN3X-UJUJ>].

companies could face at least some reputational damage, potential marketplace impacts as customers and investors react to the news, and, in some cases, litigation.⁶⁹ Simply put, companies will need to undertake corporate commitments to net-zero emissions with care. As the next Part explains, business leaders should anticipate that many stakeholders will want to probe the seriousness of purpose behind their company pledges.

II. MAKING SENSE OF NET-ZERO GHG COMMITMENTS

Most net-zero pledges lack a clear definition and established parameters.⁷⁰ The challenge in this respect has been highlighted by Lucas Joppa, Microsoft's chief environmental officer, who observed that without a "shared definition of what net zero means, it means that we have dysfunctional markets as well."⁷¹ Specifically, without clarity on what net-zero pledges mean, investors, bankers, and consumers lack material information when making decisions on pricing, purchasing, portfolio choices, and market transactions. With a wide range of possible meanings—and certainly no objective definition—a net-zero pledge *could* be a commitment to transformative change in accordance with the demands of a clean energy future. Or it could be a commitment to something *much* less significant. In some cases, it might even represent a false promise or outright fraud. This uncertainty must be addressed.

Accordingly, in this Part, we cut through the fog surrounding net-zero commitments and examine the issues at play. We dedicate the Sections that follow to answering some key questions that emerge in developing net-zero pledges, including:

69. See *Rechtbank Den Haag* 26 mei 2021, C/09/571932 (Milieudefensie et al./Royal Dutch Shell) (Neth.) (in which a Dutch environmental group sued Shell for violating a duty of care and human rights obligations with its contributions to climate change). See also Geetanjali Ganguly et al., *If at First You Don't Succeed: Suing Corporations for Climate Change*, 38 OXFORD J. LEGAL STUD. 841 (2018); Lisa Benjamin, *The Road to Paris Runs through Delaware: Climate Litigation and Directors' Duties* 2020 UTAH L. REV. 313 (2020).

70. For a useful guide at a macro level, see Sam Fankhauser et al., *The Meaning of Net Zero and How to Get It Right*, 12 NATURE CLIMATE CHANGE 15 (2022).

71. Heather Clancy, *Why Microsoft Uses the Term 'Net Zero' Carefully*, GREENBIZ (Aug. 2, 2021), <https://www.greenbiz.com/article/why-microsoft-uses-term-net-zero-carefully> [<https://perma.cc/6BKV-PM6A>]; Peter Boyd & Casey R. Pickett, *To Achieve Net-Zero, Let's Agree on One Definition of Success*, GREENBIZ (Sept. 28, 2020), <https://www.greenbiz.com/article/achieve-net-zero-lets-agree-one-definition-success> [<https://perma.cc/KE9T-BJ4B>].

(1) core definitional issues; (2) the scope of GHGs covered by pledges; (3) the emissions baseline (or starting point for measurement); (4) inclusion of offsets, along with carbon capture and storage; (5) target dates; (6) how companies measure and report their progress; and (7) the development of business transformation and transition strategies.

A. Definitional Issues

The lack of clear and consistent definitions creates confusion about what concepts such as *climate neutrality*, *carbon neutrality*, and *net-zero* mean.⁷² Carbon neutrality was first in vogue in the 2000s and, more recently, a number of companies have committed to becoming *climate neutral*.⁷³ But these pledges often provide little clarity about the company's commitment.⁷⁴ In many cases, companies seem to be simply planning to purchase carbon offsets after undertaking modest efforts to reduce their emissions.⁷⁵ In contrast, a net-zero pledge is generally seen as a more comprehensive commitment to emissions reductions.⁷⁶

It has been suggested that carbon neutrality means balancing GHG emissions by *offsetting* them, while a commitment to net-zero means first reducing GHG emissions and removing residual emissions from the atmosphere.⁷⁷ But carbon neutrality can mean more than offsetting emissions. In fact, in 2006, when *carbon neutral* was designated the “Word of

72. *Race to Zero*, RACE TO ZERO LEXICON (2021).

73. See, e.g., *Environmental Protection Along the Entire Value Chain*, BOSCH, <https://www.bosch.com/sustainability/environment> [<https://perma.cc/C65Q-XY49>].

74. Joeri Rogelj et al., *Net-Zero Emissions Targets Are Vague: Three Ways to Fix*, 591 NATURE 365 (2021).

75. *Heavy Reliance on Carbon Offsets Undermines Net-Zero Goals*, UN CLIMATE SUMMIT (Oct. 22, 2021), <https://unclimatesummit.org/heavy-reliance-on-carbon-offsets-undermines-net-zero-goals> [<https://perma.cc/AE2Z-7QR4>] [hereinafter *Heavy Reliance on Carbon Offsets*].

76. See Larry Fink, *The Power of Capitalism*, BLACKROCK (Jan. 18, 2022), <https://www.blackrock.com/corporate/investor-relations/larry-fink-ceo-letter> [<https://perma.cc/9MEA-SMUB>]; *Climate Action 100+ Calls for Net-Zero Business Strategies & Sets Out Benchmark of Largest Corporate Emitters*, CLIMATE ACTION 100+ (Sept. 14, 2020), <https://www.climateaction100.org/news/climate-action-100-calls-for-net-zero-business-strategies-sets-out-benchmark-of-largest-corporate-emitters> [<https://perma.cc/P3XP-GUES>].

77. See, e.g., Emma Charlton, *What's the Difference Between Carbon Negative and Carbon Neutral?*, WORLD ECON. F. (Mar. 12, 2020), <https://www.weforum.org/agenda/2020/03/what-s-the-difference-between-carbon-negative-and-carbon-neutral> [<https://perma.cc/TGA8-LQ99>].

the Year” by the *New Oxford American Dictionary*, the term was defined as “calculating your total climate-damaging carbon emissions, reducing them where possible, and then balancing your remaining emissions, often by purchasing a carbon offset.”⁷⁸ Today, many companies understand carbon neutrality as setting a commitment for their own emissions (i.e., Scope 1 and 2 emissions, defined as direct emissions and GHG emissions associated with purchased electricity, heating, and cooling). Moreover, offsets are still very much present in most net-zero commitments to date, although they imply like-for-like offsets.

While any of these terms could be the basis for a meaningful corporate pledge to comprehensive climate change action, none of the terms *definitively* indicates the depth of a company’s actual commitment to GHG emissions reduction, and carbon neutrality remains ambiguous.⁷⁹ So whatever term a company chooses to deploy in presenting its commitment, observers will need to look at the details undergirding the pledge.

Moreover, a net-zero commitment does not *necessarily* mean that a company intends to end its GHG emissions. Instead, such a pledge will generally be understood as a commitment to reduce GHG emissions to the greatest extent possible, with any residual emissions being removed in some fashion. But the real issue is what *share of the pledge* will be met with emissions reductions and how big the residual emissions that require offsets will be. Difficult-to-decarbonize sectors, such as steel, cement, or aviation, might be expected to have quite substantial ongoing emissions, so a GHG reduction of 60 to 80 percent accompanied by a rigorous offset program might *today* be considered a serious climate change strategy. In these sectors, climate-focused investments in research and development will be critical to decarbonizing activities in the long run.⁸⁰ But our informal survey of corporate leaders and policymakers suggests that, in most other industries, emissions reductions of roughly 95

78. *Carbon Neutral: Oxford Word of the Year*, OXFORD UNIV. PRESS: OUPBLOG (Nov. 13, 2006), https://blog.oup.com/2006/11/carbon_neutral [<https://perma.cc/UU5Y-CLVQ>].

79. Boyd & Pickett, *supra* note 71.

80. See Matthew Hutson, *The Promise of Carbon-Neutral Steel*, NEW YORKER (Sept. 18, 2021), <https://www.newyorker.com/news/annals-of-a-warming-planet/the-promise-of-carbon-neutral-steel> [<https://perma.cc/NE8N-LDA9>]; Natalie Muller & Neil King, *Aviation: Germany Opens World’s First Plant for Clean Jet Fuel*, DW NEWS (Apr. 10, 2021), <https://www.dw.com/en/sustainable-aviation-fuel-power-to-liquid/a-59398405> [<https://perma.cc/UW4L-YN52>].

percent will likely be the goal that stakeholders will want to see. For reference, SBTi sets a universal threshold of 95 percent for Scope 1 and 2 and 67 percent for total Scope 3 (i.e., indirect emissions associated with a company's value chain not counted in Scope 1 or 2).⁸¹

We would add that, given the profound challenge of achieving *true* zero emissions (at any scale), promises of zero emissions should be viewed with skepticism. These pledges, like net-zero commitments more broadly, should not be taken at face value. Instead, the details of the company's strategy for its business model transformation should be carefully explored.⁸²

B. Scope of GHGs Covered

At the outset, the overarching goal of a successful global response to climate change requires that *all* GHGs be addressed. No company should expect credit for a narrow CO₂ emissions pledge. Indeed, any entity that focuses on carbon emissions alone could be suspected of attempting to evade responsibility for emitting other GHGs with even greater Global Warming Potential (GWP) values, such as methane, nitrous oxide, or hydrofluorocarbons (HFCs). Those gases represent over a quarter of GHG emissions and must be addressed together with CO₂ emissions.⁸³

A second issue related to the comprehensiveness of a net-zero GHG pledge concerns the *scope* of emissions covered—with reference to the methodology for reporting emissions established by the Greenhouse Gas Protocol organized by the WRI and the World Business Council for Sustainable Development.⁸⁴ As a basic matter, most companies have recognized the need to address their Scope 1 and 2 emissions.

Pledges by companies with significant Scope 3 emissions that exclude these indirect emissions from their net-zero

81. SCIENCE BASED TARGETS, SBTI CRITERIA AND RECOMMENDATIONS (2021).

82. Esty & Lubin, *supra* note 28.

83. *World Greenhouse Gas Emissions in 2018 by Sector, End Use and Gases*, CLIMATE WATCH (July 2022), <https://www.climatewatchdata.org/embed/key-visualizations?visualization=7> [<https://perma.cc/65FL-8AF2>].

84. WORLD BUS. COUNCIL FOR SUSTAINABLE DEV. & WORLD RES. INST., *THE GREENHOUSE GAS PROTOCOL: A CORPORATE ACCOUNTING AND REPORTING STANDARD* (2015) [hereinafter GREENHOUSE GAS PROTOCOL]; WORLD RES. INST. & WORLD BUS. COUNCIL FOR SUSTAINABLE DEV., *CORPORATE VALUE CHAIN (SCOPE 3) ACCOUNTING AND REPORTING STANDARD: SUPPLEMENT TO THE GHG PROTOCOL CORPORATE ACCOUNTING AND REPORTING STANDARD* (2011).

commitment will generally be seen as inadequate. Not only does this artificial narrowing of the target greatly reduce the efforts needed to transform the enterprise's business model, but the limited focus on Scope 1 and 2 emissions also distorts the picture of the company's overall carbon footprint.⁸⁵ In such cases, we see little justification for excluding Scope 3 emissions in the net-zero commitment—as it is the indirect emissions that matter for a number of critical sectors including oil and gas, automobiles, and aircraft manufacturing. We note, moreover, that there is likely to be a rising push for large companies to report on Scope 3 across all manufacturing sectors, recognizing that such companies have some degree of control over their value chains, including choice of suppliers, distribution, and the use and end-of-life treatment of their products.

C. Emissions Baseline

When setting a net-zero commitment, another critical parameter will be the baseline (i.e., the starting point from which decarbonization efforts begin).⁸⁶ An inventory of current emissions, along with a defined baseline year, help to clarify the scale of the effort needed to reach the net-zero GHG emissions goal. A breakdown of emissions across business units, geographic regions, and scopes will be needed to highlight the priorities for a company's decarbonization efforts. In addition, companies may well find themselves under pressure to spell out

85. Edgar G. Hertwich & Richard Wood, *The Growing Importance of Scope 3 Greenhouse Gas Emissions from Industry*, 13 ENV'T RSCH. LETTERS, Oct. 2018, at 1–10; Christian Blanco et al., *The State of Supply Chain Carbon Footprinting: Analysis of CDP Disclosures by US Firms*, 135 J. CLEANER PROD. 1189 (2016); see also Benoît Mercereau et al., *Fighting Climate Change as a Global Equity Investor*, 21 J. ASSET MGMT. 70, 81 (2020); Frances Bowen & J. Alberto Aragon-Correa, *Greenwashing in Corporate Environmentalism Research and Practice: The Importance of What We Say and Do*, 27 ORG. & ENV'T 107 (2014); Michael Corkery & Julie Creswell, *Corporate Climate Pledges Often Ignore a Key Component: Supply Chains*, N.Y. TIMES, <https://www.nytimes.com/2021/11/02/business/corporate-climate-pledge-supply-chain.html> [<https://perma.cc/3VJU-GLVW>] (Nov. 3, 2021); David Fickling & Elaine He, *The Biggest Polluters Are Hiding in Plain Sight*, BLOOMBERG: BLOOMBERG OP. (Sept. 30, 2020), <https://www.bloomberg.com/graphics/2020-opinion-climate-global-biggest-polluters-scope-3-emissions-disclosures> [<https://perma.cc/66B8-SDNM>].

86. See, e.g., VICTORIA NOVIKOVA ET AL., COMPENDIUM ON GREENHOUSE GAS BASELINES AND MONITORING: NATIONAL-LEVEL MITIGATION ACTIONS (2016); cf. GREENHOUSE GAS PROTOCOL, *supra* note 84, at 38.

their past emissions trajectory and their recent track record of increasing or decreasing emissions.

Such a breakdown of emissions will be especially valuable where the net-zero commitment builds on prior emissions-reduction targets. In particular, it will provide important context for those evaluating the pace and structure of a company's GHG emissions reduction plan. In some such cases, companies that have already diligently worked to cut their GHG emissions may have come down the decarbonization learning curve and developed their own best practices for emissions reduction—and thus are positioned for a faster push toward the net-zero target. In other cases, the data on past efforts might indicate that a company has picked all the low-hanging decarbonization fruit and now faces a much greater challenge in generating the next increment of reductions.

D. Offsets, Carbon Capture, and Carbon Storage

A growing number of companies, cities, and financial institutions include carbon offsets in their net-zero transition strategies.⁸⁷ But the reliance on offsets raises a further set of issues and methodological concerns including questions around improper carbon accounting, negative unintended impacts on humans or ecosystems, and the potential re-release of captured carbon.⁸⁸

Offsets come in many forms and vary greatly in terms of GHG emissions-reduction effects. Some carbon neutrality pledges, for instance, have claimed as offsets various types of avoided emissions—such as funding ecosystem conservation or renewable energy projects.⁸⁹ The offset thus derives from the premise that, without such actions, GHG emissions would have been generated. The problem with this theory is that it offers no guarantee that actual society-wide emissions have been reduced.

87. Sarah McFarlane, *Carbon Offsets Are Used by Companies Seeking 'Net Zero,' but Concerns Persist*, WALL ST. J. (Oct. 24, 2021, 8:44 AM), <https://www.wsj.com/articles/carbon-offsets-are-used-by-companies-seeking-net-zero-but-concerns-persist-11635079489> [<https://perma.cc/D3TS-L5EJ>].

88. Myles Allen et al., *The Oxford Principles for Net Zero Aligned Carbon Offsetting*, UNIV. OXFORD (Sept. 2020), <https://www.smithschool.ox.ac.uk/sites/default/files/2022-01/Oxford-Offsetting-Principles-2020.pdf> [<https://perma.cc/AM7J-MUV3>].

89. See, e.g., *Heavy Reliance on Carbon Offsets*, *supra* note 75 (naming Chevron as an example of a company relying heavily on offsets related to ecosystem conversation and reforestation).

Despite their popularity, fewer than 5 percent of offsets have been demonstrated to remove CO₂ from the atmosphere.⁹⁰ While that type of investment may have value for the environment and society, only offsets that *demonstrably* and *substantially* eliminate emissions are worthy of the name. Even well-established compliance markets of carbon offsets, such as California's Cap-and-Trade program, have proven unable to guarantee basic requirements regarding *additionality* and *leakage* (i.e., that GHG emissions would not have been reduced in the absence of the offsets and that the offsets are not merely displacing the emissions).⁹¹

We note, moreover, that the voluntary market for offsets remains largely unstructured and unregulated.⁹² As a result, it often operates informally—so informally, in fact, that results frequently fall short of expectations.⁹³ Although the purchase of offsets through third parties is intended to ensure execution by professionals, there are no widely accepted means of certifying, verifying, or validating offsets.⁹⁴ Efforts to bring structure to this market through self-regulation are underway, but, so far,

90. Frances Schwartzkopff, 'Crazy' Carbon Offsets Market Prompts Calls for Regulation, BLOOMBERG, <https://www.bloomberg.com/news/articles/2022-01-06/crazy-carbon-offsets-market-prompts-calls-for-regulation?sref=KC8MQm0x> [<https://perma.cc/MZG8-SQ6K>] (Jan. 6, 2022, 5:44 AM).

91. Grayson Badgley et al., *Systematic Over-Crediting in California's Forest Carbon Offsets Program*, 28 GLOB. CHANGE BIOLOGY 1433 (2022).

92. We note that the European Commission has launched an initiative for the accounting and certification of carbon removals. See *Communication from the Commission to the European Parliament and the Council, Sustainable Carbon Cycles*, at 19–21, COM (2021) 800 final (Dec. 15, 2021).

93. See Michael Gillenwater et al., *Policing the Voluntary Carbon Market*, 6 NATURE REPS. CLIMATE CHANGE 85 (2007); K. Kathy Dhanda & Laura P. Hartman, *The Ethics of Carbon Neutrality: A Critical Examination of Voluntary Carbon Offset Providers*, 100 J. BUS. ETHICS 119 (2011); Carsten Warnecke et al., *Robust Eligibility Criteria Essential for New Global Scheme to Offset Aviation Emissions*, 9 NATURE CLIMATE CHANGE 218 (2019); Christopher Blaufelder et al., *A Blueprint for Scaling Voluntary Carbon Markets to Meet the Climate Challenge*, MCKINSEY (Jan. 29, 2021), <https://www.mckinsey.com/business-functions/sustainability/our-insights/a-blueprint-for-scaling-voluntary-carbon-markets-to-meet-the-climate-challenge> [<https://perma.cc/SC2U-7EA2>]; Patrick Greenfield, *Carbon Offsets Used by Major Airlines Based on Flawed System, Warn Experts*, GUARDIAN, <https://www.theguardian.com/environment/2021/may/04/carbon-offsets-used-by-major-airlines-based-on-flawed-system-warn-experts> [<https://perma.cc/3K4G-6T5Y>] (Aug. 25, 2021).

94. Certification in a credible registry, like the Gold Standard's registry, is indicative of a clear commitment, but without rigorous due diligence, issues still arise.

there has been little progress.⁹⁵ Those making offsets part of their net-zero game plan should therefore expect to have the details of their offset strategies subject to searching review and verification.

With respect to Carbon Capture and Storage (CCS) in particular, two core approaches exist: (1) nature-based solutions that seek to expand the natural uptake of CO₂ and (2) engineered CO₂ removal from the air. While the resources committed to the science and engineering of carbon capture and sequestration have expanded rapidly in recent years, and the opportunities for further innovation seem significant,⁹⁶ these technological approaches vary widely in terms of current carbon-removal capacity and feasibility.

The opportunity to capture carbon through efforts to reduce deforestation, promote reforestation and afforestation, and ensure better management of existing forests and other carbon sinks, is well-documented.⁹⁷ Indeed, a vast number of tree-planting initiatives have been launched, although not all have performed as well as their proponents had hoped, especially due to the difficulty in guaranteeing *permanence* as the effects of climate change spread.⁹⁸ Furthermore, the IPCC has recently

95. Schwartzkopff, *supra* note 90; TASK FORCE ON SCALING VOLUNTARY CARBON MARKETS, PHASE II REPORT (2021); VOLUNTARY CARBON MKTS. INTEGRITY INITIATIVE, ALIGNING VOLUNTARY CARBON MARKETS WITH THE 1.5°C PARIS AGREEMENT AMBITION (2021); Robert O. Mendelsohn et al., *A Framework to Ensure that Voluntary Carbon Markets Will Truly Help Combat Climate Change*, BROOKINGS INST. (Sept. 16, 2021), <https://www.brookings.edu/research/a-framework-to-ensure-that-voluntary-carbon-markets-will-truly-help-combat-climate-change> [<https://perma.cc/2WVT-YJRX>].

96. WAKE SMITH, PANDORA'S TOOLBOX: THE HOPES AND HAZARDS OF CLIMATE INTERVENTION (2022); Bronson W. Griscom et al., *Natural Climate Solutions*, 114 PROC. NAT'L ACAD. SCI. 11645 (2017); Elizabeth Kolbert, *Can Carbon-Dioxide Removal Save the World?*, NEW YORKER (Nov. 13, 2017), <https://www.newyorker.com/magazine/2017/11/20/can-carbon-dioxide-removal-save-the-world> [<https://perma.cc/474B-5JWQ>].

97. R. K. Dixon et al., *Carbon Pools and Flux of Global Forest Ecosystem*, 263 SCIENCE 185 (1994); W. L. Silver et al., *The Potential for Carbon Sequestration Through Reforestation of Abandoned Tropical Agricultural and Pasture Lands*, 8 RESTORATION ECOLOGY 394 (2000); Molly Hawes, *Planting Carbon Storage*, 8 NATURE CLIMATE CHANGE 556 (2018); Jonah Busch et al., *Potential for Low-Cost Carbon Dioxide Removal Through Tropical Reforestation*, 9 NATURE CLIMATE CHANGE 463 (2019).

98. Additionally, nature-based solutions, used as offsets, cannot be considered by companies as *substitutes* for reducing emissions in the first place. See Brendan Mackey et al., *Untangling the Confusion Around Land Carbon Science and Climate Change Mitigation Policy*, 3 NATURE CLIMATE CHANGE 552 (2013); Ing-Marie Gren & Abenezer Zeleke Aklilu, *Policy Design for Forest Carbon Sequestration: A Review*

pointed out risks from poorly executed afforestation projects that result in negative carbon sinks.⁹⁹ For these reasons, the details behind any proposed offset project should be disclosed to ensure informed investor decision-making.

Other nature-based solutions—such as projects to genetically modify trees and plants to hold greater stores of CO₂, advance regenerative agriculture, or expand carbon uptake in the ocean through fertilization of phytoplankton—are all attracting significant research attention,¹⁰⁰ but their potential scope and promise remain uncertain. In this regard, at least some pledges to invest in carbon capture innovation will likely be recognized as worthy but not the same as GHG emissions reductions or carbon uptake through a carefully designed, scientifically implemented, and independently verified offset project.

Likewise, the broader science-and-technology methods of carbon removal—including post-combustion carbon capture in smokestacks and direct air capture—remain under development.¹⁰¹ Thus, despite the interest of many actors (including the IPCC and the IEA) in anthropogenic CO₂ removal,¹⁰² the economic feasibility and scalability of these engineered approaches continue to be undetermined.¹⁰³

E. Target Dates

Another critical variable for net-zero pledges is their target date. While the emerging consensus is that society needs to

of the Literature, 70 *FOREST POLY & ECON.* 128 (2016); Lorenzo Bernasconi, *A Natural Approach to Net Zero*, in *SETTLING CLIMATE ACCOUNTS: NAVIGATING THE ROAD TO NET ZERO* 121 (Thomas Heller & Alicia Seiger eds., 2021).

99. IPCC, *Summary for Policymakers*, in *CLIMATE CHANGE 2022: IMPACTS, ADAPTATION AND VULNERABILITY* 1, 32 (2022).

100. NAT'L ACADS. SCI., ENG'G & MED., *NEGATIVE EMISSIONS TECHNOLOGIES AND RELIABLE SEQUESTRATION: A RESEARCH AGENDA* (2019) [hereinafter *NEGATIVE EMISSIONS TECHNOLOGIES*]; Carlos M. Duarte et al., *A Seaweed Aquaculture Imperative to Meet Global Sustainability Targets*, 5 *NATURE SUSTAINABILITY* 185 (2022); Angelyca A. Jackson Hammond et al., *Implementing the Soil Enrichment Protocol at Scale: Opportunities for an Agricultural Carbon Market*, *FRONTIERS IN CLIMATE*, June 21, 2021, at 1; David J. Beerling et al., *Potential for Large-Scale CO₂ Modeling via Enhanced Rock Weathering with Croplands*, 583 *NATURE* 242 (2020).

101. *DIRECT AIR CAPTURE: MORE EFFORTS NEEDED*, IEA (Sept. 2022), <https://www.iea.org/reports/direct-air-capture> [<https://perma.cc/Y525-X3N6>].

102. See IPCC WG III, *supra* note 9; IEA *NET ZERO BY 2050*, *supra* note 12.

103. Cf. *NEGATIVE EMISSIONS TECHNOLOGIES*, *supra* note 100.

achieve net-zero GHG emissions by 2050, there is no commonly accepted target date for corporate net-zero commitments—as well as a large degree of fluctuation in company targets.¹⁰⁴ Likewise, the available frameworks and models do *not* impose 2050 as a target date.¹⁰⁵ This lack of standardization is not unsurprising given the differences of business sectors and business models from one company to another.

Yet the absence of a commonly accepted deadline for completion of the net-zero transition could encourage companies to set very distant targets and to procrastinate the necessary action to reduce their emissions. These concerns are exacerbated by the fact that the target date for net-zero GHG emissions at the planetary level is not totally fixed but instead reflects modeling on GHG emissions that is continuously evolving, and the scientific community's best understanding at any given time. The most recent IPCC report, for example, concludes that, given current GHG emissions trajectories, the global community should aim to achieve net-zero emissions by *2040*, not 2050, to limit global warming to 1.5 degrees C.¹⁰⁶ Indeed, a number of companies, led by Amazon (and backed by a \$2 billion fund to accelerate innovation in support of the net-zero economy of the future), have signed on to the Climate Pledge, which calls for signatories to commit to net-zero carbon by 2040.¹⁰⁷

F. Metrics, Transparency, and Reporting

The corporate net-zero GHG pledges offered to date show little consistency in their proposed reporting and updating and reflect widely divergent standards of transparency. The overarching problem can be traced to a lack of consistency in

104. SBTi, *supra* note 41, at 15; NET ZERO STOCKTAKE 2022, *supra* note 6, at 28–31.

105. NET ZERO STOCKTAKE 2022, *supra* note 6, at 28–31. *See generally* INST. FOR SUSTAINABILITY LEADERSHIP: UNIV. OF CAMBRIDGE, APPLYING THE LONG VIEW TO INVESTMENT FUNDS: INTRODUCING THE LONG-TERM DISCLOSURE FRAMEWORK (2019); CLIMATE ACTION 100+, 2021 YEAR IN REVIEW: A PROGRESS UPDATE (2022).

106. IPCC WG I, *supra* note 8, at SP-14.

107. *See About the Climate Pledge*, CLIMATE PLEDGE, <https://www.theclimatepledge.com/us/en/the-pledge/About> [<https://perma.cc/H8X4-3K8R>]; CLIMATE PLEDGE, *supra* note 44; NET ZERO STOCKTAKE 2022, *supra* note 6; Dana Mattioli, *Amazon to Launch \$2 Billion Venture Capital Fund to Invest in Clean Energy*, WALL ST. J., https://www.wsj.com/articles/amazon-to-launch-2-billion-venture-capital-fund-to-invest-in-clean-energy-11592910001?mod=hp_lead_pos7 [<https://perma.cc/2LU9-8CQG>] (June 23, 2020, 5:09 PM).

widely available ESG data and metrics. The absence of ESG frameworks that provide material, comparable, and verified corporate sustainability performance data makes company-to-company comparisons difficult. Studies in recent years have pointed out how the wide variations in corporate sustainability reporting render many ESG scorecards and benchmarking exercises virtually worthless.¹⁰⁸

Not all reporting frameworks are created equal. Even though significant business community sectors have rallied for the climate risk framework advanced by the TCFD,¹⁰⁹ we see the TCFD structure as ill-suited to net-zero GHG reporting given its narrow focus on climate-related risks for businesses and its lack of methodological standards for companies to follow in their reporting—limiting comparability across companies and industries. Instead, we think the ESG frameworks of the Global Reporting Initiative (GRI), SASB (now consolidated into the International Sustainability Standards Board), and the World Economic Forum (WEF) provide a better starting point for what we believe is ultimately required—a government-mandated corporate ESG reporting protocol that encompasses the critical elements of net-zero pledges.¹¹⁰

Absent an established reporting methodology, company self-reported GHG emissions data cannot be counted on as a dependable progress measurement toward net-zero targets (however defined) due to the divergent standards deployed across the business world. For example, some corporations

108. Daniel C. Esty, *Creating Investment-Grade Metrics*, in VALUES AT WORK: SUSTAINABLE INVESTING AND ESG REPORTING, *supra* note 27, at 51; Samuel Dremptic et al., *The Influence of Firm Size on the ESG Score: Corporate Sustainability Ratings Under Review*, 167 J. BUS. ETHICS 333 (2020); *see also* Florian Berg et al., *Aggregate Confusion: The Divergence of ESG Ratings* (forthcoming), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3438533 [<https://perma.cc/QS2M-AVC5>]; RICARDO BOFFO & ROBERT PATALANO, OECD, ESG INVESTING: PRACTICES, PROGRESS AND CHALLENGES (2020).

109. *See TFCF Supporters*, TASKFORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES, <https://www.fsb-tcf.org/supporters> [<https://perma.cc/UK3X-DKBL>].

110. Daniel C. Esty & Todd Cort, *Toward Enhanced Corporate Sustainability Disclosure: Making ESG Reporting Serve Investor Needs*, 16 VA. L. & BUS. REV. 423 (2022). For additional background information, *see* GLOB. REPORTING INITIATIVE & SUSTAINABILITY ACCT. STANDARDS BD., A PRACTICAL GUIDE TO SUSTAINABILITY REPORTING USING GRI AND SASB STANDARDS (2021); WORLD ECON. F., MEASURING STAKEHOLDER CAPITALISM: TOWARDS COMMON METRICS AND CONSISTENT REPORTING OF SUSTAINABLE VALUE CREATION (2020).

report only their Scope 1 and 2 emissions.¹¹¹ Others also include Scope 3, but some use their own methodologies for calculating their GHG totals—once again, making benchmarking very difficult.¹¹² In fact, research from MSCI, one of the leading sustainability data aggregators, suggests that companies often cherry-pick the Scope 3 emissions they report.¹¹³ Admittedly, GHG reporting can be complicated. For instance, the Greenhouse Gas Protocol, as commonly used guidance, distinguishes fifteen separate categories and many more subcategories of Scope 3 emissions.¹¹⁴ But without a common reporting platform, it is virtually impossible to have clarity regarding a company's GHG footprint or an accurate picture of how the enterprise compares to its industry peers.

In addition, as discussed above, some pledges address just one type of emissions—typically CO₂—and overlook other material GHG emissions with greater GWP, like those originating from methane and nitrous oxide.¹¹⁵ Some companies, moreover, rely on emissions estimates rather than emissions measurements, reflecting the reality that meaningful GHG emissions data collection requires a significant investment of resources.¹¹⁶ Likewise, some companies report emissions for all business units and across all geographies, while others disclose more narrowly.¹¹⁷ A further comparability issue arises

111. NET ZERO STOCKTAKE 2022, *supra* note 6, at 30; *see, e.g., Top US Food and Beverage Companies Scope 3 Emissions Disclosure and Reductions*, CERES, <https://engagethechain.org/top-us-food-and-beverage-companies-scope-3-emissions-disclosure-and-reductions> [<https://perma.cc/A3S9-N63G>] [hereinafter *Top US Food*].

112. NET ZERO STOCKTAKE 2022, *supra* note 6, at 30; *see* Blanco et al., *supra* note 85.

113. Brendan Baker, *Scope 3 Emissions: Seeing the Full Picture*, MSCI (Sept. 17, 2020), <https://www.msci.com/www/blog-posts/scope-3-carbon-emissions-seeing/02092372761> [<https://perma.cc/RWB9-YA5J>]; *see also* MSCI, THE MSCI NET-ZERO TRACKER (2021).

114. GREENHOUSE GAS PROTOCOL, *supra* note 84, at 29.

115. *See Top US Food*, *supra* note 111; NEW CLIMATE INST., CORPORATE CLIMATE RESPONSIBILITY MONITOR 2022: ASSESSING THE TRANSPARENCY AND INTEGRITY OF COMPANIES' EMISSION REDUCTION AND NET-ZERO TARGETS 54, 101 (2022), <https://newclimate.org/wp-content/uploads/2022/02/CorporateClimateResponsibilityMonitor2022.pdf> [<https://perma.cc/AQ42-Y2WG>].

116. Jean Eaglesham, *Companies Are Tallying Their Carbon Emissions, But the Data Can Be Tricky*, WALL ST. J. (Sept. 3, 2021, 5:30 AM), <https://www.wsj.com/articles/companies-are-tallying-their-carbon-emissions-but-the-data-can-be-tricky-11630661401> [<https://perma.cc/HZ5A-CXF7>].

117. Baker, *supra* note 113.

because some conglomerates report on a consolidated basis and others track performance on a more disaggregated basis. Above and beyond the need for an overarching view of companies with subsidiaries, there exists an added challenge of getting accurate comparisons across corporations in industries where some companies are vertically integrated, and others are not.

It should go without saying that precise reporting—including honesty about data gaps and prompt correction of any errors discovered in prior reports—will be essential to establishing credibility and trust. The Volkswagen “Dieselgate” scandal offers a prime exhibit of the financial, reputational, and litigation risks companies face if they mislead the public and regulators with sustainability pledges they disregard or if they manipulate their emissions data rather than undertake the real changes required to achieve emissions reductions.¹¹⁸

Until a mandatory framework of sustainability metrics and ESG reporting methodologies is in place, companies will be under pressure to provide third-party verification of the data they report along the way to achieving their net-zero emissions target.¹¹⁹ Of course, external auditing and verification is costly. Some companies may therefore be tempted to self-validate and save the expense on an external auditor, but we see this as a mistake. Furthermore, third-party validation provides a guarantee against conflicts of interest that may result in undercounting GHG emissions and overcrediting offsets. Absent independent validation, company data and reporting on progress toward net-zero GHG targets, even “science-based targets,” will

118. Sarah Dadush, *Identity Harm*, 89 U. COLO. L. REV. 863, 889–93 (2018) (discussing the effects on Volkswagen from the scandal involving the company’s use of computer software—called *defeat devices*—which allowed emissions control equipment on Volkswagen cars to pass emissions tests but then shut off during regular use, improving fuel efficiency).

119. See Daniel C. Esty & Todd Cort, *Corporate Sustainability Metrics: What Investors Need and Don’t Get*, 8 J. ENV’T INVESTING 11, 35 (2017). For additional background information, see Maria Csutora & Gabor Harangozo, *Twenty Years of Carbon Accounting and Auditing—A Review and Outlook*, 39 SOC’Y & ECON. 459 (2017); Diane Strauss & Aisha I. Saad, *Can Investors Rely on Corporate Sustainability Commitments?*, in VALUES AT WORK: SUSTAINABLE INVESTING AND ESG REPORTING, *supra* note 27, at 195; Alfonso Del Giudice & Silvia Rigamonti, *Does Audit Improve the Quality of ESG Scores? Evidence from Corporate Misconduct*, 12 SUSTAINABILITY 5670 (2020); Hanlu Fan et al., *An International Study of Carbon Information Asymmetry and Independent Carbon Assurance*, 53 BRIT. ACCT. REV. 1 (2021).

likely not be trusted.¹²⁰ Simply put, third-party verification makes reliable cross-company comparisons possible—and provides a trusted basis for decisions on the part of investors, bankers, consumers, and others who will want to be able to distinguish between companies helping to move society toward a sustainable future from those who are not.¹²¹

G. Business Transformation and Transition Strategies

As society moves toward deep decarbonization in the decades ahead, no business will operate as it has in the past.¹²² The pathway to net-zero GHG emissions will often be far from clear—and will vary considerably from industry to industry and from company to company. As there is no established playbook for businesses to follow in moving away from GHGs, what companies say about their theories of change and strategies for business model transition is worth analyzing. Likewise, execution on climate change commitments and reporting on investments undertaken (both in terms of capital and human resource capabilities) are what really matters, as this information will provide markets, regulators, and the public with a perspective on which companies have serious transition strategies unfolding—and which do not. In this regard, it remains unclear *how* the corporations that have pledged net-zero commitments will fulfill their lofty goals. According to the IEA, about 40 percent of companies committing to net-zero targets have offered almost no plan for how they intend to achieve that objective.¹²³

Empty promises of decarbonization bear the risk of damaging the legitimacy of net-zero commitments. Thus, along with every net-zero GHG pledge, there should be an explanation of how the company intends to transform its business in the face of the emerging sustainability imperative (effectively

120. We note in this regard that the SBTi does not require third-party validation—a major weakness from our perspective.

121. See generally Daniel C. Esty & Quentin Karpilow, *Harnessing Investor Interest in Sustainability: The Next Frontier in Environmental Information Regulation*, 36 YALE J. REG. 625 (2019).

122. See generally Esty & Lubin, *supra* note 28. For background information on the transformative nature of the net-zero transition, see Stephen Pye et al., *Modelling Net-Zero Emissions Energy Systems Requires a Change in Approach*, 21 CLIMATE POL'Y 222 (2021).

123. IEA NET ZERO BY 2050, *supra* note 12, at 35; see also NET ZERO STOCKTAKE 2022, *supra* note 6, at 31.

prohibiting pollution spillovers or other uninternalized externalities) in general and the net-zero GHG requirement in particular.

The IPCC estimates that limiting global warming to 1.5 degrees Celsius will require global GHG emissions be cut in half by 2030.¹²⁴ As a result, companies that ignore the need for early action and only set distant targets jeopardize the prospects of meeting the goals of the Paris Agreement. Accordingly, corporate net-zero pledges need to be accompanied by plans for more immediate emissions reductions and interim targets on the way to the end goal. The path forward will vary widely depending on the industry and company needs, including each company's core competencies, perceived competitive challenges and opportunities, and other unique circumstances. Decarbonization frameworks can guide the development of a business transition strategy, but each company will have to design their own decarbonization approach.

From the perspective of the interested stakeholders, only with a granular picture of the executive leadership team's business transformation strategy in mind will it be possible to identify which companies are serious about meeting the challenge of the sustainability imperative broadly and addressing the changing requirements for profitability and marketplace success in the low-carbon future. As Esty and Lubin observe, in calling for a "next generation of corporate sustainability metrics," what investors really need will be "insights on the strategies developed by management teams to transition their business models for success under profoundly changed societal and market demands."¹²⁵

III. MOVING FORWARD: BEST PRACTICES FOR COMPANIES AND A STRATEGY FOR HARD LAW ENFORCEMENT

Part II highlighted a number of issues that must be addressed to ensure that the emerging net-zero pledge soft law regime and the ESG frameworks that track corporate sustainability work to differentiate leaders from laggards more broadly. But the discussion also highlighted a number of challenges facing this regime. Of course, governments could address these gaps by requiring comprehensive climate change

124. IPCC WG III, *supra* note 9, at 21.

125. Esty & Lubin, *supra* note 28, at 97.

policies, perhaps including mandatory approaches to corporate ESG reporting. But until that time, the world of net-zero pledges seems likely to continue to be shaped by private actors whose leadership promises to create significant incentives to get the business community to respond to climate change.

The framework that is being created already shows signs of being incomplete and uneven. Most notably, the loose structure of pledges and vague commitments make reliable company-to-company and industry-to-industry comparisons difficult.¹²⁶ From the perspective of private investors seeking to align their portfolios with their values, this lack of transparency and analytic rigor creates a risk that misinformation or disinformation will cloud the picture of what the business community is really doing on climate change. The lack of legal requirements for GHG pledges or ESG reporting more generally means that corporations could selectively and deceptively make empty promises about their plans and self-report on their terms about their own self-defined progress.

In response, we seek to specify the appropriate contours of the soft law regime and to highlight ways that the framework that is coming together might be improved upon. In Section A, we explore the context in which net-zero pledges have been made—beginning with the revolution in ESG reporting over the last decade as well as the broader demand for corporate sustainability. In Section B, we then discuss how the soft law regime might be strengthened and how the guidelines and expectations of the current moment might ultimately harden into formal obligations. Finally, in Section C, we lay out a series of *best practices* that should guide the framing of corporate net-zero commitments. Our discussion here tracks the challenges spotlighted in Part II and provides recommendations for overcoming and resolving these issues.

126. Comparisons in sustainability performance are particularly challenging with respect to private companies since they are subjected to little reporting requirements. See Cem Veziroğlu and Abdurrahman Kayıklık, *The Climate Crisis and Private Companies: How to Address the Sustainability Arbitrage Problem?* (Aug. 19, 2022) (unpublished manuscript), <https://ssrn.com/abstract=4075870> [<https://perma.cc/P58Z-E9E6>]; Alperen A. Gözlügöl & Wolf-Georg Ringe, *Private Companies: The Missing Link on the Path to Net Zero* (Eur. Corp. Governing Inst. L. Working Paper No. 635/2022, 2022), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4065115 [<https://perma.cc/9MQ8-DHQ9>].

A. *Contours of the Soft Law Regime*

As we have observed, the soft law regime provides a valuable way to get corporate action on climate change going. But it is likely to be insufficient by itself. The absence of a requirement to make a net-zero emissions pledge—much less any requirements that govern the *content* of any such pledge—means that the corporate response to climate change remains voluntary. The likely result is that committed companies will take their GHG emissions control commitments seriously while less socially responsible enterprises may attempt to be *free riders* on the actions of others.

We nonetheless believe that developing a set of best practices for companies making net-zero pledges will help establish the contours of what these commitments should look like—and thus give some structure to the soft law regime. We note in this regard that the evolution of ESG reporting over the past decade offers an example of how a soft law regime emerges, is refined, and ultimately hardens into formal legal obligations.

In the absence of government-mandated ESG reporting requirements, a decentralized system of voluntary corporate disclosures run by a set of private organizations—such as the GRI, TFCO, SASB, and CDP—has filled the void. And dozens of private data providers—such as MSCI, Bloomberg, Sustainalytics, Refinitiv, and ISS/oeekom—collect and distribute ESG scores on thousands of companies covering their GHG emissions, commitments to clean energy, air and water pollution, chemical and waste management, and dozens of other issues.¹²⁷

While some observers have decried the ESG reporting framework that presently exists as manifestly incomplete and inadequate,¹²⁸ investors have put more than \$30 trillion into hundreds of sustainability-oriented mutual funds and exchange traded funds (ETFs) that build on the available sustainability metrics.¹²⁹ Interest in sustainable investing shows no sign of abating, and thus pressure increases for ever-better ESG metrics to strengthen the shaky data foundations on which these

127. E.g., Elyse Douglas et al., *Responsible Investing: Guide to ESG Data Providers and Relevant Trends*, 8 J. ENV'T INVESTING 92, 96 (2017).

128. See Esty & Cort, *supra* note 119.

129. GLOB. SUSTAINABILITY INV. ALL., GLOBAL SUSTAINABLE INVESTMENT REVIEW 2020, at 9 (2021).

funds are built. In parallel, corporations report being overwhelmed by the alphabet soup of ESG reporting frameworks and the never-ending flow of data requests they receive from competing data providers, as well as concerns that “the lack of consistent legal requirements” may subject them to liability risks.¹³⁰

B. The Nascent Regulatory Framework: From More Transparency to Net-Zero Obligations

The chaos in ESG reporting, as well as demands from sustainability-minded investors for more trustworthy corporate sustainability metrics, has put pressure on governments to develop a rigorous set of ESG reporting requirements. It is therefore not surprising that regulators, such as the U.S. Securities and Exchange Commission (SEC), are considering new transparency requirements that would apply to net-zero commitments. This trend confirms our view that net-zero GHG commitments have become a *norm* for companies in many settings and an element of their social license to operate. And the evolution from being a soft law *expectation* to a hard law *requirement* is already underway as evidenced by the E.U.’s Corporate Sustainability Reporting Directive (CSRD), which will require all large companies to publish net-zero transition plans.¹³¹

In the United States, the SEC has not yet unveiled its final rule on the disclosure of climate-related risks. The Commission’s March 2022 proposed rule would impose transparency obligations on publicly listed companies related to their climate risk exposure,¹³² adding to the modest climate change disclosure guidance adopted in 2010.¹³³ If adopted, the SEC’s proposed rule would require these companies to disclose all climate-related financial risks and opportunities likely to affect their businesses

130. Esty & Cort, *supra* note 110, at 453.

131. *Proposal for a Directive of the European Parliament and of the Council: Amending Directive 2013/34/EU, Directive 2004/109/EC, Directive 2006/43/EC and Regulation (EU) No 537/2014, As Regards Corporate Sustainability Reporting*, at 5, COM (2021) 189 final (Apr. 4, 2021).

132. The Enhancement and Standardization of Climate-Related Disclosures for Investors, 87 Fed. Reg. 21334 (Mar. 21, 2022) (to be codified at 17 C.F.R. § 210, 229, 232, 239, & 249 (2022)) [hereinafter SEC’s Proposed Rule].

133. SEC, RELEASE NOS. 33-9106; 34-61469; FR-82, COMMISSION GUIDANCE REGARDING DISCLOSURE RELATED TO CLIMATE CHANGE (2010).

in their annual reports.¹³⁴ These disclosures would also need to include relevant information on climate change governance and risk management processes as well as information on their Scope 1 and 2 emissions and Scope 3 when deemed material.¹³⁵ These requirements rely on the Greenhouse Gas Protocol as a reference point and closely follow the framework proposed by the TCFD.¹³⁶

The SEC proposal contemplates additional and more specific disclosures from public companies that have set climate-related targets and goals. Specifically, companies that have set “any targets or goals related to the reduction of GHG emissions, or any other climate-related target or goal” would be required to submit information about: (1) the scope of activities and emissions covered by the target; (2) the baseline; (3) the target date and any interim targets and whether those targets are “consistent with one or more goals established by a climate-related treaty, law, regulation, policy, or organization”; (4) general information about the underlying strategy; (5) annual reports quantifying progress against the climate-related target or goal; and (6) information about the use of carbon offsets.¹³⁷

The SEC’s 2022 proposal answers (in part) the continued calls from sustainability-minded investors for broader mandatory ESG reporting, but the final regulations remain narrowly focused on climate change issues. Moreover, the regulations remain under debate with extensive legal challenges anticipated.

In contrast, the E.U. has advanced an ambitious CSRD in the context of the E.U. Green Deal, which represents the most demanding legal framework for sustainability disclosure in the world. In contrast with the SEC’s proposed rule or the U.K. Sustainability Disclosures Regulation (SDR), the CSRD opts for a *double materiality* approach that would require companies not only to disclose their exposures to sustainability risks, but also to be transparent about their impact on climate and the

134. Cf. SEC’s Proposed Rule, *supra* note 132.

135. *Id.*

136. See generally TASK FORCE ON CLIMATE-RELATED FIN. DISCLOSURES, FINAL REPORT (2017); TASK FORCE ON CLIMATE-RELATED FIN. DISCLOSURES, GUIDANCE ON METRICS, TARGETS, AND TRANSITION PLANS (2021).

137. SEC’s Proposed Rule, *supra* note 132, § 229.1506.

environment.¹³⁸ Furthermore, the CSRD will require companies to publish their targets and plans to ensure their business model and strategy are compatible with the E.U. objective of climate neutrality by 2050.¹³⁹ This framework will, in effect, require all large companies to publish net-zero transition plans. Moreover, reported sustainability information will have to be certified by an accredited independent auditor or certifier.¹⁴⁰ The CSRD will apply to all large and publicly listed companies and groups, as well as to some non-European companies that have a substantial E.U. presence.¹⁴¹

Regulatory initiatives, like the SEC's and the E.U.'s, confirm that net-zero commitments could follow a path from privately defined origins as soft law to a formal government-defined reporting structure. And though the fate of the SEC's proposed rule is uncertain in the context of a growing reconsideration of the administrative state,¹⁴² the rule is consistent with the SEC's broad authority to prescribe rules that are "necessary or appropriate in the public interest or for the protection of investors."¹⁴³ If anything, it is also on par with the U.S. Supreme Court's past caselaw on financial materiality, which centers on disclosure of information that a "reasonable investor" would likely view as significant in making an investment decision.¹⁴⁴

C. Soft Law Scaffolding: Best Practices and ESG Metrics

Despite our favorable commentary on voluntary net-zero corporate commitments, we do not believe that a soft law approach to GHG pledges alone will optimally engage companies

138. Directive (EU) 2022/2464, of the European Parliament and of the Council of 14 December 2022 amending Regulation (EU) No 537/2014, Directive 2004/109/EC, Directive 2006/43/EC and Directive 2013/34/EU, as Regards Corporate Sustainability Reporting, 2022 O.J. (L 322/15) art. 1(4) & 1(8).

139. *Id.* at art. 1(4), 1(7).

140. *Id.* at art. 1(13).

141. *Id.* at art. 1(4), 1(7).

142. *See* West Virginia v. EPA, 142 S. Ct. 2587 (2022).

143. *See, e.g.*, 15 U.S.C. §§ 77g, 77j, 77s(a), 78c, 78i, 78j, 78l, 78m(a), 78n(a), 78o(d), 78w(a); *see also* Nat. Res. Def. Council, Inc. v. Sec. & Exch. Comm'n, 606 F.2d 1031, 1045 (D.C. Cir. 1979).

144. *See* TSC Industries v. Northway, Inc., 426 U.S. 438, 449 (1976) ("[T]here must be a substantial likelihood that the disclosure . . . would have been viewed by the reasonable investor as having significantly altered the 'total mix' of information made available."); *Basic Inc. v. Levinson*, 485 U.S. 224, 231–32 (1988) (adopting the TSC formulation in the context of securities fraud actions under Rule 10b-5).

in the requisite transition. To ensure that all companies regear themselves around the requirements of net-zero emissions by 2050, legal frameworks that *compel* these commitments and *guide* how they are constructed will be needed—more in keeping with the European model than the American one. Indeed, the proposed U.S. regulations seem to be headed in a different direction—requiring limited transparency on a narrow set of issues. To facilitate the development of both the soft law framework in the short run and the detailed government reporting requirements needed in the longer term, we offer below a set of net-zero GHG emissions pledge best practices.

Our corporate net-zero GHG pledge taxonomy spells out the elements that a company pledge should include as well as a structure for illuminating the details behind the commitment. This framework also offers those wishing to evaluate net-zero GHG pledges—most notably those in the investment world—a structured way to separate true decarbonization leadership from subpar net-zero strategies or, worse yet, empty promises and greenwashing.

1. Net-Zero Pledge Coverage

A serious net-zero pledge should be *comprehensive*, covering both GHG emissions in their globality and across scopes. This means that a net-zero pledge should encompass all GHG emissions—including CO₂, methane, nitrous oxide, black carbon, industrial gases (such as SF₆), and HFCs—from the entire enterprise, including all business units and subsidiaries and across all geographies in which the business operates.

The pledge should encompass the company's full GHG emissions footprint—including Scope 1, Scope 2, and Scope 3 emissions. Emissions should further be reported category by category and entity by entity across the company—including a full geographic scope and all subsidiaries. Any omissions should be clearly identified and explained—perhaps noting the lack of materiality or unavailability of data.

2. Pledge Goal Date and Interim Targets

Companies should specify the date that they will achieve net-zero GHG emissions. Recognizing that the target date specified will be seen as a critical indicator of the seriousness of

the commitment, we argue that it must not be later than 2050. And we believe that leading companies are increasingly recognizing the importance of setting a 2040 deadline for transforming their business model to a net-zero future. According to the IEA, around 60 percent of the corporate pledges made to date target net-zero emissions by 2050.¹⁴⁵ To ensure that companies are achieving steady reductions in their emissions that align with their ultimate goal, they should also specify interim targets such as their planned emissions levels in 2025, 2030, and 2035 that are consistent with climate science.

3. Business Transformation Strategy

Making a net-zero emissions pledge by itself is useful but insufficient. Serious pledges must be accompanied by a comprehensive business transformation strategy that includes the pathway to net-zero GHG emissions, the recast business model that will be pursued, the investments being undertaken in both hard assets and human resources, and the actions required by value chain partners (notably suppliers and customers).¹⁴⁶ The credibility of the commitment will be enhanced where companies also specify the uncertainties they face, any gaps in the planned pathway, the net-zero target, and the areas of innovation required to deliver their proposed transformation.¹⁴⁷

We suggest that those seeking to gauge the strength and seriousness of a corporate net-zero commitment must undertake a deep dive into the details undergirding the company's pledge—with particular attention paid to the details of the:

- business model transition proposed;
- strategy for achieving competitive advantage and ongoing profitability in a deeply decarbonized world;

145. IEA NET ZERO BY 2050, *supra* note 12, at 35.

146. Concrete strategies legitimize corporate promises and have the potential to hold companies accountable for pledges or promises made.

147. See Lucas Joppa et al., *Microsoft's Million-Tonne CO₂-Removal Purchase—Lessons for Net Zero*, 597 NATURE 629 (2021).

- resources needed (including external partnerships) to execute on the vision;
- investments to be made in the technologies, core competencies, and human resources required for success in a transformed business landscape; and
- plans for reporting and identified checkpoints that will allow outsiders to track progress on the path to the requisite business transformation and achievement of the net-zero emissions goal.

4. Corporate Governance and Company-Wide Commitment

Success in delivering on a serious net-zero emissions target will require significant management effort and direction from a supportive board of directors, which in turn requires good corporate governance.¹⁴⁸ To fulfill a corporate commitment to net-zero emissions, the key decision-makers of a company must all be aligned and play their respective roles in delivering the transformative change required.¹⁴⁹ In gauging the depth of a company's net-zero GHG commitment and the prospects the enterprise will meet its emissions reduction goal, observers will want to look for evidence that the requisite strong corporate governance is in place, including:

- backing by the board;
- visible CEO leadership on pledge execution as well as clear operational leadership—perhaps through the chief sustainability officer or the chief strategy officer;
- top management alignment on the goal and requirements for delivering on it, notably by tying compensation of top

148. See Todd Cort, *ESG Risk Depends on Management Control Quality*, in VALUES AT WORK: SUSTAINABLE INVESTING AND ESG REPORTING, *supra* note 27, at 35.

149. See John Armour et al., *Green Pills* (Eur. Corp. Governing Inst. L. Working Paper No. 657/2022, 2022), https://ecgi.global/sites/default/files/working_papers/documents/greenpillsfinal_0.pdf [<https://perma.cc/E3X8-GKVK>].

managers to climate-related performance and the associated business transformation;

- mechanisms for bringing managers at all levels of the company into the effort (e.g., via key performance indicators encompassing progress toward the net-zero goal);
- employee engagement engendered through internal communications, training, innovation challenges, and creation of an integrated, sustainability-focused company culture;
- public policy alignment with the pledge (including lobbying, industry association activities, and corporate campaign contributions); and
- regular internal progress reporting overseen by top management and an engaged board, as well as robust external reporting on the pledge progress, challenges, and opportunities.

5. Emissions Reduction Versus Offsetting

Clarity on what percentage of the goal will be achieved by emissions reductions versus carbon offsets is a critical element for any company's net-zero GHG pledge. The logic here is clear: emissions reductions are the most certain and effective means to achieve net-zero targets.¹⁵⁰ As a result, many stakeholders will look askance at a strategy that relies heavily on offsets—except perhaps in the most difficult-to-decarbonize sectors such as aviation and shipping. We suggest that the best practice in this regard would be to consider offsets only as a complement to emissions reductions—and utilized only to the extent that eliminating residual emissions is either *impossible* or *highly impractical*.¹⁵¹ In this regard, we believe that companies in

150. See generally IPCC WG III, *supra* note 9.

151. Duncan P. McLaren et al., *Beyond "Net-Zero": A Case for Separate Targets for Emissions Reduction and Negative Emissions*, 1 FRONTIERS IN CLIMATE, Aug. 21, 2019, at 1–5; Mackey et al., *supra* note 98; Susanne Becken & Brendan Mackey, *What Role for Offsetting Aviation Greenhouse Gas Emissions in a Deep-Cut Carbon World?*, 63 J. AIR TRANS. MGMT. 71 (2017).

difficult-to-decarbonize industries—including steel, cement, chemicals, aviation, and shipping—should be expected to have offsets constitute a more significant part of their nascent net-zero strategy than companies in other industries.

If offsets are to be used, the company should discuss the details of the projects they propose and should not claim credit for *avoided emissions*, as detailed in Subsection 7 below. A genuine contribution to a net-zero GHG future requires actual and measured carbon removal.

6. Calibrating Offsets

Recognizing that offsets come in many shapes and sizes, companies that plan to offset their residual emissions should be asked to provide detailed plans on:

- the exclusivity and nature of the carbon capture project and the science behind the proposed GHG reductions or removals (including proposed conversion methodologies of non-CO₂ climate pollutants into CO₂ terms according to their actual warming impact);
- the location of the initiative, complemented by an assessment of social impact (to avoid any potential negative impact on local communities such as loss of agricultural land, violations of local community land rights, and loss of livelihood to farmers), as well as the vulnerability of this geographic area to climate change effects, such as reduced rainfall and biodiversity loss, that might diminish the project's success;
- the timescale of the project and anticipated carbon uptake over this time frame;
- due diligence of the implementing partner, namely the project team's track record in delivering the promised carbon uptake in prior projects and any potential reputational risks;
- the scale of resources committed to the project, including funding for ongoing project stewardship over time;

- the scientific demonstration of *additionality*, *permanence*,¹⁵² and *leakage* prevention—ensuring that society-wide emissions will decline and not simply shift from one place (or time) to another; and
- the external verification and public reporting by third parties of the baseline, offsets, and emissions emitted during the project lifetime.

While no widely accepted offset standards exist, there are some emerging protocols or frameworks that might provide companies with some structure and guidance as they design their offset strategies and projects.¹⁵³

7. Transparency

For any emissions reduction strategy to be effective, companies must develop a comprehensive and methodologically rigorous strategy for managing the data and metrics that will be used to track progress along the path to the net-zero emissions goal. Careful data gathering, regular reporting following well-established methodologies, and independent data validation are all required so that the company, its investors, and the broader public can assess the implementation of the net-zero commitment and the speed and success of the business model transformation that underpins it.

A vital component of any corporate emissions-reduction strategy involves regular and comprehensive public reporting on progress toward the net-zero GHG goal and the business model transformation required to deliver it. Annual reporting should detail performance against interim targets across all GHGs, business lines, markets, subsidiaries, and emissions scopes—providing all interested stakeholders with a clear picture of the company's pathway toward fulfilling its commitment to a sustainable future. Leading-edge companies may find that real-time reporting on a constantly updated website is even more valuable—particularly as a mechanism for employee engagement.

152. MYLES ALLEN ET AL., UNIV. OF OXFORD, THE OXFORD PRINCIPLES FOR NET ZERO ALIGNED CARBON OFFSETTING 6–7 (2020).

153. See generally *id.*; Joppa et al., *supra* note 147; WORLD ECON. F., NET-ZERO TO NET-NEGATIVE: A GUIDE FOR LEADERS ON CARBON REMOVAL (2021).

Consistency should be a hallmark of reporting on net-zero GHG pledges. Indeed, we envision that companies following net-zero pledge reporting best practices will need to adhere to triple consistency encompassing:

- internal consistency of their own metrics over time to guarantee data comparability, transparency, and the ability to track progress;¹⁵⁴
- consistency with the evolving sustainability reporting best practices to ensure data quality and comparability in the absence of mandatory sustainability disclosures;¹⁵⁵ and
- financial reporting consistency to provide clarity on investments being undertaken to support the business transformation plan.¹⁵⁶

The alignment with financial reporting will be especially important as capital expenditures give a sense of a company's ongoing investments to meet its net-zero GHG target. Likewise, inconsistencies between a company's financial disclosures and its sustainability reporting, including its narrative and metrics related to a net-zero GHG emissions pledge, should be seen as a red flag to those assessing the seriousness of decarbonization commitments.

CONCLUSION

The momentum behind corporate net-zero GHG pledges has emerged with remarkable speed. In the absence of regulation, companies are taking it upon themselves to step up to the issue of climate change—and launching significant decarbonization efforts. But the substance behind these pledges varies widely.

154. Where methodologies evolve—as per the next point—companies will need to adopt procedures for *backcasting* to ensure that their current performances can be understood in context and evaluated on a consistent basis.

155. We note that both the E.U. and the U.K. are advancing proposals to better structure this reporting.

156. See *generally* CLIMATE DISCLOSURE STANDARDS BD., ACCOUNTING FOR CLIMATE: INTEGRATING CLIMATE-RELATED MATTERS INTO FINANCIAL REPORTING (2020); INSTITUTIONAL INVS. GRP. ON CLIMATE CHANGE, INVESTOR EXPECTATIONS FOR PARIS-ALIGNED ACCOUNTS (2020); CDP, PUTTING A PRICE ON CARBON: THE STATE OF INTERNAL CARBON PRICING BY CORPORATES GLOBALLY (2021).

Some companies are developing clear, methodologically rigorous strategies for deep decarbonization and business model transformation backed by investments and management incentives. For many others, the genuineness of their pledges is much less clear.

But these corporate net-zero GHG pledges must be understood as more than self-regulation. They represent an important emerging framework of *soft law*—with standards being set, incentives for participation being created, and market discipline being provided by an engaged set of stakeholders—most notably from the investment world. Whether this foundation for the required business transformations will, by itself, be enough to drive a comprehensive response to climate change—characterized by Sir Nicholas Stern as “the biggest market failure the world has seen”¹⁵⁷—remains open to debate. Likewise, whether the corporate trend toward taking seriously the *sustainability imperative* and adopting a mission centered on *stakeholder responsibility* remains to be seen.

In this Article, we have outlined a number of recommendations for the soft law framework needed to backstop meaningful corporate net-zero GHG pledges—and a parallel structure for investors and the public to deploy in trying to distinguish deep decarbonization leaders from laggards. These recommendations cover a wide array of issues, from the details of the pledge itself to critical elements of corporate governance that might be required for success in delivering on a net-zero GHG goal. A common thread in our recommendations is transparency, which emerges as the key to the credibility of any net-zero GHG commitment and to society’s ability to track climate change progress coming from the business world.

As we have made clear, there is a great deal of work to be done to refine the net-zero pledge *best practices*. And while this work is ongoing, the emerging set of soft law guidelines seems to have allowed the world community to turn a corner in its commitment to climate change action with the business community leading the way. But as we have also stressed, progress toward a sustainable future would be faster and smoother if governments built on the tapestry of soft law and established robust climate change action plans and mandatory corporate ESG reporting frameworks that induce companies to

157. Nicholas Stern, *The Economics of Climate Change*, 98 AM. ECON. REV. 1, 1 (2008).

spell out their strategies for business model transformation in alignment with the realities of a sustainable future.