CORPORATE CLIMATE TARGETS: SCIENCE, DISCRETION, AND CLIMATE-WASHING

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The use of corporate climate targets has exploded in recent years and now encompasses many of the world's largest and most profitable companies. In a corporate climate target, a company voluntarily commits to reducing its emissions in line with climate science and the Paris Agreement. The broad adoption of these targets raises important questions: are these commitments truly aligned with science in the way they are advertised, or do they raise "climate-washing" concerns; i.e., do they exaggerate the benefits and significance of the climate targets? This Article investigates the role that science actually plays within targets and explores different types of climate-washing concerns when commitments turn out to be exaggerated. This Article's analysis focuses on corporate targets issued as part of the Science-Based Targets Initiative (SBTi), the preeminent standard-setting body in the field. The Article finds that the role of science in SBTi's rule framework is more complex than it first appears. SBTi rules employ a scientific concept known as the global carbon budget, but scientific knowledge alone cannot translate that carbon budget, which is indeed global, to company-level targets. When SBTi provides that translation in its rules, it is not merely deriving targets from science, but exercising considerable discretion. That discretion, and its distributive implications, are currently under-appreciated in both academia and practice. Building on this analysis, the Article turns to articulating climate-washing concerns in corporate targets and identifying relevant theories of liability. The key, it argues, is to move beyond the instinct that a target can only amount to climate-washing if it is in direct conflict with science. Because science itself cannot determine appropriate company-level targets, the Article helps to identify other avenues through which advocates may pursue climate-washing liability.

INTRODUCTION

Recent years have witnessed dramatic growth in voluntary corporate climate targets. With a corporate climate target, a company calculates its greenhouse gas (GHG) emissions and commits to reducing those emissions at a given rate to reach a target by a given year. It is common for corporate climate targets to be issued according to technical standards created by specialized nongovernmental actors. One standard-setting body—the Science-Based Targets Initiative, or "SBTi"—has gained tremendous influence in the field. As of late 2023, companies making voluntary commitments to targets under SBTi's standard represent a staggering 39% of global market capitalization.[1] SBTi's rise to prominence is also highlighted by the

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Biden Administration's 2022 proposed *Federal Supplier Climate Risks and Resilience Rule*.[2] The proposed rule requires major federal contractors to set and validate SBTi targets.

SBTi claims that the corporate climate targets issued under its standards are "science-based," in the sense that the speed of GHG reduction under the targets is aligned with the Paris Agreement's goal of containing global warming to well-below 2°C, and ideally, no more than 1.5°C above pre-industrial levels.[3] According to this view, a company committing to an SBTi target is exercising good corporate citizenship by assuming its "fair share" of necessary GHG reductions.[4] Critics of SBTi, and corporate climate targets more generally, have expressed skepticism regarding such claims and concerns with potential "climate-washing."[5] Climate-washing

[1] *See* SBTI, SBTI MONITORING REPORT 2023: LOOKING BACK AND 2023 AND MOVING FORWARD TO 2024 AND Beyond 8 (2024), https://sciencebasedtargets.org/resources/files/SBTiMonitoringReport2023.pdf. "Market capitalization" refers to the total value of stock of publicly traded company. "Global market capitalization" refers to the market of all publicly listed companies around the world.

[2] *See* 87 Fed. Reg. 68312 (Nov. 14, 2022).

[3] *See What Are Science-Based Targets?*, SBTI, https://sciencebasedtargets.org/how-it-works (last visited Apr. 25, 2024). Note that while SBTi currently focuses on 1.5°C aligned targets, it has previously certified WB2C targets as science-based. See e.g., SBTI, SBTI CORPORATE MANUAL 5 (Dec. 2021), https://sciencebasedtargets.org/resources/files/Legacy-SBTi-Corporate-Manual-V2.0.pdf; SBTI, PATHWAYS TO NET-ZERO: SBTI TECHNICAL SUMMARY 1 (Oct. 2021), https://sciencebasedtargets.org/resources/files/Pathway-to-Net-Zero.pdf.

[4] *See Science Based Targets*, CAMBRIDGE UNIV., https://www.environment.admin.cam.ac.uk/science-based-targets (last visited Oct. 22, 2024).

[5] *See* THOMAS DAY ET AL., CORPORATE CLIMATE RESPONSIBILITY MONITOR 2022: ASSESSING THE TRANSPARENCY AND INTEGRITY OF COMPANIES' EMISSION REDUCTION AND NET-ZERO TARGETS (2022) [hereinafter CCRM 2022], https://newclimate.org/sites/default/files/2022/02/CorporateClimateResponsibilityMonitor2022.pdf; THOMAS DAY ET AL., NEWCLIMATE INST., CORPORATE CLIMATE RESPONSIBILITY MONITOR 2023: ASSESSING THE TRANSPARENCY AND INTEGRITY OF COMPANIES' EMISSION REDUCTION AND NET-ZERO TARGETS (2023) [hereinafter CCRM 2023], https://newclimate.org/sites/default/files/2023-04/NewClimate_CorporateClimateResponsibilityMonitor2023_Feb23.pdf; THOMAS DAY ET AL., NEWCLIMATE INST., CORPORATE CLIMATE RESPONSIBILITY MONITOR 2024: ASSESSING THE TRANSPARENCY AND INTEGRITY OF COMPANIES' EMISSION REDUCTION AND NET-ZERO TARGETS (2024) [hereinafter CCRM 2024], https://newclimate.org/sites/default/files/2024-08/NewClimate_CCRM2024.pdf. For discussion of CCRM's concerns, see IV.A infra. Note that terminologically,

refers to incorrect or exaggerated claims about the climate benefits of an organization's actions. Climate-washing has a dampening effect on demand for true climate action because it leads stakeholders to believe that necessary actions are already underway.[6]

This Article analyzes two questions regarding corporate climate targets. The first question concerns the relationship between corporate climate targets and climate science: how should one understand the role of science in "science-based targets"? As lawyers, we might feel ill-equipped to answer such a question because it presumably requires an understanding of climate science, but this is not necessarily the case.

For all its complexity, climate scientific work results in a set of easily understandable figures that go under the label of the "global carbon budget."[7] The global carbon budget is published by the Intergovernmental Panel on Climate Change (IPCC), and reflects the maximum amount and pace of GHGs that the global economy can emit without crossing Paris Agreement temperature thresholds.[8] The goal of this article is to understand the relationship between the global carbon budget and SBTi's target rule framework. As a fairly detailed set of rules, that framework falls well within the domain of legal analysis.

With respect to this first question, the Article finds that the relationship between corporate climate targets and science is more complex than it first appears. On the one hand, the global carbon budget provides the analytical foundation for SBTi targets, and therefore links the targets with scientific work. On the other hand, as its name suggests, the global carbon budget applies at the global level, whereas SBTi provides targets at the individual company level. That translation from the global carbon budget to the company-level target is not merely the work of science; it involves significant discretion. SBTi rules do not merely deduce targets from

the CCRM often uses the language of "greenwashing" as distinct from "climate-washing" used in this Article.

[6] *See infra* Part IV.

[7] *See infra* Part I.

[8] *See* Intergovernmental Panel on Climate Change, *Annex I: Glossary*, *in* SPECIAL REPORT: GLOBAL WARMING OF 1.5° C 544, 557 (J.B. Robin Matthews ed., 2018), https://doi.org/10.1017/9781009157940.008 ("carbon budget" and "remaining carbon budget").

the global carbon budget, but essentially allocate that budget according to principles that cannot themselves be determined scientifically. In short, SBTi offers a system that is policy-judgement-based and value-based as much as it is science-based.

Consider the following analogy. A young country needs to establish its tax system. A budgetary committee advised by technical experts is convened to determine the total annual revenue that the young country would need to raise. For simplicity, assume that the tax revenue amount recommended by the expert budgetary committee enjoys widespread credibility, and raises no controversy. Next, a second, legislative committee, is tasked with writing a tax code to raise the revenue amount. The legislative committee then describes the code as "based on the work of the expert budget committee." How should one evaluate that claim?

The answer is that there is a lot of discretion that goes from needing to raise a certain amount, to determining the rules as to how that amount will be raised. Will the tax base consist of income, property, or sales? And if income is chosen, how exactly is the term "income" to be defined? And what are the income brackets that will determine how progressive the tax is, and thus, the distribution of the tax burden across the population? What are potential loopholes that taxpayers can exploit through tax planning? These are all complex and somewhat controversial questions of law and policy. To speak of the tax code as being "based" on or "derived from" the expert budget committee's work is accurate in the sense that that work provided a point of departure. But this characterization deemphasizes the discretion it took to get from uncontroversial expert judgements to controversial distributive outcomes. This oversimplification can be problematic. It makes political determinations by the legislative committee appear to have the same level of legitimacy as the original expert determinations.

Transitioning back to the climate space, IPCC is like the budget committee whereas SBTi works as the legislative committee deciding rules for the share of emissions that would need to be reduced by companies.[9] This Article looks at SBTi rules as a primary source, and uses these rules to distinguish between the widely accepted global carbon budget figures and the allocative and more political nature of the SBTi rule framework. In several instances, it highlights

[9] Recall that SBTi targets are voluntary.

that what SBTi considers to be "science-based" targets can legitimately be viewed as under-ambitious and overly generous to corporations. To be clear, the Article is not arguing that SBTi falsely represents that its targets are logical deductions from climate science. The Article does, however, express concern that SBTi targets enjoy an excess of legitimacy of the kind described above.[10] The message of the Article is that there is real value in scrutinizing the translation from science to rules and highlighting the normative choices involved.

The second question this Article addresses is climate-washing in corporate climate targets. An intuitive way to think about climate-washing is by direct reference to climate science. Under this approach, a corporate climate target amounts to climate-washing if the corporation's actions are not truly consistent with science-based pathways to meeting the goals of the Paris Agreement. This approach is less promising than it first appears. While there are instances where targets seem inconsistent with science, the concern with these targets goes somewhat deeper. As noted above, climate science determines a carbon budget that is global, but in-and-of-itself, science cannot allocate that budget. Often, the issue is not that corporate climate targets are inconsistent with the science per se, but that they represent one particular vision of action based on climate science. That particular vision is then elevated to the status of the "science-based" target. As climate advocates, this realization represents somewhat of a challenge. If climate-washing does not mean that the target is simply "inconsistent with the science," what does it mean exactly? This question is not merely theoretical, but significant for the growing field of climate-washing litigation.[11] Actions regarding climate-washing in corporate targets represent an important frontier in that field.

[10] For a similar perspective, *see* Tilsted et al., *Corporate Climate Futures in the Making: Why We Need Research on the Politics of Science—Based Targets*, 103 ENERGY RES. & SOC. SCI. 103, 103, 229 (2023). Concerns with lack of specificity regarding the normative underpinnings of SBTi targets also arise in the technical literature. *See* Anders Bjørn et al., *Reply to Comment on 'From the Paris Agreement to Corporate Climate Commitments: Evaluation of Seven Methods for Setting "Science-Based" Emission Targets'*, 17 ENV'T. RSCH. LETTERS 1, 3 (2022), https://iopscience.iop.org/article/10.1088/1748-9326/ac548e/pdf ("… we encourage more research on how to communicate normative aspects of scenarios to companies and their stakeholders.").

[11] *See* CCRM 2024, *supra* note 5, at 63.

Here, the Article suggests we relax the focus on inconsistency with climate science and refocus on a different set of normative concerns. The Article details a broader variety of normative concerns with specific examples where these concerns apply. It also provides a high-level discussion of theories of legal liability that advocates may pursue to address the concerns. The first climate-washing concern (Type 1) is with instances of non-compliance with SBTi target rules. In setting SBTi targets, companies must follow SBTi's detailed rules. However, research by climate advocates has raised concerns that some companies' targets may not comply with SBTi rules, meaning that the ambition of these companies' targets was reduced in non-transparent ways.

The second climate-washing concern (Type 2) is with misleading of consumers regarding the target's ambition. Here, we assume a given target is SBTi-compliant, but that the SBTi standard itself can mislead consumers. From a liability point of view, consumer perception is a useful concept, because it can be proven empirically through focus group surveys.

The third climate-washing concern (Type 3) refers to those instances where target-setting methods are in direct tension with science. As discussed below, even when inconsistency with science can be demonstrated, it would often be easier to litigate climate-washing as matter of consumer perception (Type 2).

The fourth and final concern (Type 4), conceives of climate-washing as over-emphasizing the role of science in targets. In this case, the issues involved are too technical for there to be clear consumer perception. Instead, the concern is that the standards governing SBTi targets over-emphasize the role of science in ways that make the term "science-based" misleading. From a liability point of view, this fourth theory would likely be the most difficult route for advocates to pursue.

This Article contributes to an emerging literature on corporate climate targets in legal scholarship. Several legal scholars have approached corporate climate targets through the lens of a broader phenomenon known as "private environmental governance."[12] The

[12] *See, e.g.*, Albert C. Lin, *Making Net-zero Matter*, 29 WASH. & LEE L. REV. 679, 703–708 (2022) [hereinafter Lin 2022]; Oren Perez & Michael P. Vandenbergh, *Making Climate Pledges Stick: A Private Ordering Mechanism for Climate Commitments*, 50 ECOLOGY L.Q. 683 (2024); Daniel Esty & Nathan de Ariba-Sellier,

term, coined by Michael Vandenbergh in a 2013 article, refers to instances where private actors voluntarily adopt norms of environmental conduct in the absence of mandatory government regulation.[13] Vandenbergh was especially interested in understanding the conditions and incentive structures driving private environmental action in the decades where traditional public environmental regulation failed to make significant progress. Corporate climate targets epitomize many of the themes from Vandenbergh's original article: private action filling a void left by public action on climate, consumer and investor pressures for sustainability as key incentives, the critical role of standard-setting bodies, and the potential "hardening" of soft private norms into hard state law.[14]

Another important theme of the emerging literature is concern with the climate-washing risks of corporate targets. These concerns are varied: the lack of an enforcement mechanism to ensure committed reductions are actually delivered,[15] illegitimate uses of carbon credits and removals in satisfaction of goals,[16] different definitions of the meaning of "net-zero" (and hence, under-ambitious targets for some companies),[17] and "leakages" where companies shift carbon-intensive activities to other companies, which are not themselves bound by targets.[18] Authors identifying these concerns generally seem hopeful that the relevant issues can be addressed, often through proposals made in their articles. More structural

Zeroing in On Net-zero: From Soft Law to Hard Law in Corporate Climate Pledges, 94 UNIV. COLO. L. REV. 635 (2023); Elodie O. Currier, *Virtuous Cycles: The Interaction of Public and Private Environmental Governance*, 40 PACE ENV'T L. REV. 526 (2023); Sarah E. Light & Christina P. Skinner, *Banks and Climate Governance*, 121 COLUM. L. REV. 1895 (2021).

[13] *See* Michael P. Vandenbergh, *Private Environmental Governance*, 99 CORNELL L.R. 129 (2013); *see also* Sarah P. Light & Michael P. Vandenbergh, *Private Environmental Governance, in* ENVIRONMENTAL DECISION MAKING, ENCYCLOPEDIA OF ENVIRONMENTAL LAW (LeRoy C. Paddock, et. al, eds., 2016).

[14] *See* discussion *supra* note 12.

[15] *See* Perez & Vandenbergh, *supra* note 12, at 104; Lin 2022, *supra* note 12, at 719.

[16] *See* Lin 2022, *supra* note 12, at 754; *see also* Shelly Welton, *Neutralizing the Atmosphere*, 132 YALE L. J. 171, 195–207 (2022).

[17] Esty & de Ariba-Sellier, *supra* note 12, at 652–654.

[18] Albert C. Lin, *Fixing Net-zero Leakage*, 58 WAKE FOREST L. REV. 119 (2023) [hereinafter Lin 2023].

critiques of corporate climate targets exist as well and are of special significance to the Article. Shelly Welton highlighted the way in which corporate targets ". . .intentionally [sideline] democratic and distributive considerations" involved in societal climate policy, especially as they relate to racial and economic justice. Her work also expresses concern that the uncoordinated nature of the targets can lead to policy outcomes that are incoherent when taken in the aggregate (especially with respect to carbon removal).[19] Joshua Galperin's work, while not focused on corporate climate targets specifically, offers valuable insights about the democratic deficit in the work of private environmental governance organizations and potential strategies for remediating that deficit.[20]

While the present Article shares many of the concerns expressed in the literature, its focus is different. The animating question for this Article is the role that science plays within a rule framework dubbed as "science-based." The difference in focus translates into a difference in methodology. The Article's analysis is driven by primary sources from SBTi's rule framework and relatively detailed discussions of the GHG Accounting Protocol on which the SBTi's framework relies.[21] The last part of the Article also provides in-depth discussions of the *Corporate Climate Responsibility Monitor ("CCRM")*.[22] CCRM is an annual research report assessing climate-washing concerns in corporate targets.[23] The focus on these primary sources is meant to facilitate exchange between academic and advocacy work around target monitoring and litigation.

The remainder of the Article proceeds as follows. Part I builds our understanding of the global carbon budget that underlies SBTi's

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[19] *See* Welton, *supra* note 16, at 207–234 (Welton refers to these concerns as the "neutrality mirage" and the "collective achievement challenge" respectively).

[20] *See* Joshua Galperin, *Governing Private Governance*, 56 ARIZ. ST. L. J. 765, 765–766 (2024). For further discussion of Galperin's work, *see infra* Part IV.C.4.

[21] For a recent contribution on the GHG Protocol, *see* Madison Condon, *What's Scope 3 Good For?*, 56 U.C. DAVIS L. REV. 1921 (2023). Condon's important work on Scope 3 GHG reporting is made primarily with an eye to securities disclosure requirements. The considerations involved are quite distinct from those in the target setting context that are the focus of this paper.

[22] *See* CCRM 2022, *supra* note 5; CCRM 2023, *supra* note 5; CCRM 2024, *supra* note 5.

[23] *See* CCRM 2022, *supra* note 5, at 4; CCRM 2023, *supra* note 5, at 4; CCRM 2024, *supra* note 5, at 4.

approach. Part II focuses on the process through which SBTi allocates the global carbon budget to companies setting methods. Part III turns to issues around carbon accounting, and the allocative role of carbon accounting rules. Part IV articulates the different types of climate-washing concerns raised by corporate targets as well as potential theories of legal liability.

I. THE GLOBAL CARBON BUDGET

SBTi's approach to corporate climate targets is part of a broader policy framework that we may refer to as the "alignment approach" to climate action.[24] The point of departure for the alignment approach is in a scientific concept known as the "global carbon budget" ("carbon budget"). The carbon budget refers to the total amount of carbon dioxide (CO_2) that humanity can emit into the atmosphere before reaching a certain impact on the global climate. Every carbon budget is specific to some level of global warming that policy makers seek to avoid. The 2016 Paris Agreement did not specify a single level, instead opting for a target range between "well-below 2°C ("WB2C") and 1.5°C" above pre-industrial levels (also known as the "reference period").[25] Since the Paris Agreement was signed, scientific work has highlighted that the difference in outcomes between 1.5°C and WB2C is significant.[26] Scientists also emphasize that crossing the 1.5°C threshold risks "tipping points" that can be highly destabilizing

[24] The "climate alignment" terminology is more commonly used in the context of financial sector climate targets than it is in the SBTi corporate target context. *See, e.g.*, *Climate Alignment*, CENTER FOR CLIMATE ALIGNED FINANCE, https://climatealignment.org/climate-alignment/ (last visited Jan. 26, 2024) ("Climate alignment is the process of bringing the global economy's emissions in line with 1.5°C temperature targets."). I am borrowing this terminology because it captures the defining feature of the approach: the attempt to set climate targets that are formally derived from scientific and other expert work.

[25] *See*, U.N. Framework Convention on Climate Change, *Report of the Conference of the parties on its Twenty-First Session*, U.N. Doc. FCCC/CP/2015/10/Add.1, Annex, art. 2(a) (Jan. 29, 2016) [hereinafter Paris Agreement]. Global warming is measured against temperatures in the pre-industrial era, also known as the "reference period."

[26] *See* Kelly Levin, *Half a Degree and a World Apart: The Difference in Climate Impacts Between 1.5˚C and 2˚C of Warming*, WORLD RES. INST. (Oct. 7, 2018), https://www.wri.org/insights/half-degree-and-world-apart-difference-climate-impacts-between-15c-and-2c-warming.

to the climate system.[27] The international policy community has accordingly shifted its focus to achieve the 1.5°C climate target, i.e., the bottom of the Paris range.[28] The carbon budget discussed in this Article will typically track that 1.5°C target. The global carbon budget is measured in tons of carbon dioxide, or "tCO_2" Other greenhouse gases are also incorporated into the carbon budget, and their contribution to global warming is expressed through their carbon equivalent, or CO_2e (the "e" stands for equivalent). For simplicity, the exposition below focuses on carbon alone, but the basic principles are similar.

The carbon budget figures used by policy makers are taken from the scientific work of the U.N. International Panel on Climate Change ("IPCC") and are updated in its ongoing reports. The IPCC publishes so called "pathways," each corresponding to a different level of warming (1.5°C, 2°C, 3°C etc.)[29] and each having its own carbon budget. Figure 1 below provides an example from the IPCC's most recent Assessment Report, AR6 (2023).[30] The IPCC pathway labeled SSP1-1.9 shows the total carbon budget for limiting global warming to 1.5°C with a probability greater than 50% (SSP1-1.19 appears in light-blue. The range in the graph reflects model uncertainties; for simplicity, we will focus on the mid-range).

The x-axis in Figure 1 shows cumulative CO_2 emissions since 1850, measured in gigatons (Gt) CO_2 (one gigaton is one billion tons). The carbon budget is measured in cumulative emissions because the warming effects of carbon in the atmosphere last for

[27] David I. Armstrong McKay, et al., *Exceeding 1.5°C Global Warming Could Trigger Multiple Climate Tipping Points*, 377 SCIENCE 1171 (2022).

[28] *See* G20 INDONESIA 2022, G20 BALI LEADERS' DECLARATION (2022), https://www.consilium.europa.eu/media/60201/2022-11-16-g20-declaration-data.pdf; *supra* note 25.

[29] Pathways also specify the probability for not exceeding the relevant target, for example, limiting warming to 1.5°C (>50%), limiting warming to 2°C (>67%), etc. For any given temperature threshold, the higher the probability, the lower the remaining carbon budget. *See* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2021: THE PHYSICAL SCIENCE BASIS SUMMARY FOR POLICY MAKERS 29 Table SPM.2 (2022), https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM_final.pdf.

[30] *See* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2023: SYNTHESIS REPORT CONTRIBUTION OF WORKING GROUPS I, II AND III TO THE SIXTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE 83 (H. Lee and J. Romero eds., 2023).

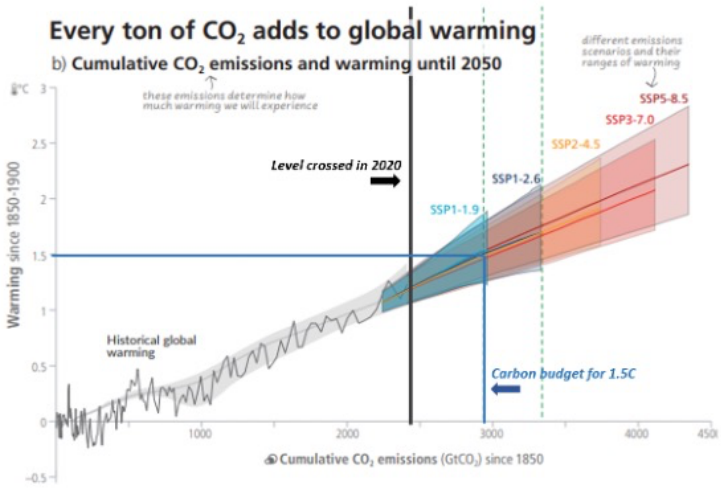
centuries. Thus, what matters from a carbon budget perspective is not merely the annual emissions, or "flows," of carbon into the atmosphere, but the accumulation, or "stock," of carbon year-over-year since the dawn of the industrial era. The y-axis shows the level of global warming since the reference period, defined as the pre-industrial average (1850–1900). The graph in that space plots the relationship between the growth in cumulative CO_2 emissions (x-axis) and global warming (y-axis). For the period before 2020 (left of the bold vertical line), we can see that about 2,500 in cumulative $GtCO_2$ resulted in warming slightly above 1°C. For the period after 2020 (right of the bold vertical line), we can see that at cumulative emissions just shy of 3,000 GtCO2e, global warming will reach 1.5°C. Any excess above 3,000 $GtCO_2$ cumulative emissions will lead to warming exceeding 1.5°C (for simplicity, consider the middle of the light blue range, which has a y-value of 1.5°C).

In IPCC terminology, using a graph like the one in Figure 1, one would speak of the "total" carbon budget for a 1.5°C target as 3,000 $GtCO_2$. More importantly, one speaks of the "remaining" or "available" carbon budget, being the maximum amount of additional carbon emissions consistent with the relevant limit on warming. Looking at the figure, the remaining carbon budget for 1.5°C equals about 500 $GtCO_2$, the difference between the total carbon budget (about 3,000 $GtCO_2$) and the amount already spent before 2020 (about 2,500 $GtCO_2$). When policy makers speak of the "carbon budget" informally, they often refer to the remaining or available carbon budget, rather than the total. A striking observation from Figure 1 is that the remaining carbon budget is very small compared to historical emissions, roughly 20% (=500 $GtCO_2$ / 2,500 $GtCO_2$). With annual global carbon emissions at around 40 tCO_2 per year,[31] if emissions stay at their current levels, the remaining carbon budget for 1.5°C will be exhausted in little over a decade (= 500 $GtCO_2$ /

[31] *See* Emissions Database for Global Atmospheric Research, *GHG Emissions of All World Countries*, EUR. COMM'N (2024), https://edgar.jrc.ec.europa.eu/report_2024?vis=co2tot#emissions_table (Visualization for "CO2 total emissions" selected, outputting for GLOBAL TOTAL of 36 $GtCO_2$ (36,154 million ton) and 39 $GtCO_2$ (39,023 million ton) for 2020 and 2023 respectively). For simplicity, in presenting global emissions and carbon budget figures, I am abstracting from distinction between "gross" and "net" emissions. The former refers to the total amount emitted, while the latter subtracts carbon sinks (e.g., from oceans and forests) from the gross figure.

40 $GtCO_2$). Venturing further right on the x-axis, we can see that pathways leading to higher levels of warming have higher total carbon budgets. For example, SSP1-2.6 (WB2C) has a total budget of about 3,400 $GtCO_2$, i.e. a remaining budget of about 900 $GtCO_2$ (as of 2020); outside the Paris range, SSP2-4.5 (2°C) has a total budget of about 3,750 tCO_2, i.e. a remaining budget of about 1,250 $GtCO_2$.The higher the targeted level of warming, the more room under the carbon budget.

Figure 1: IPCC Remaining Carbon Budget for 1.5°C and 2°C[32]



So far, we have discussed the global carbon budget as a scientific concept. To be useful in policy, the global carbon budget needs to be translated into a global emissions reduction target. The IPCC provides example pathways for how the global economy can reduce its emissions to stay below a given level of warming. The IPCC does this by taking the remaining carbon budget and dividing it over several decades to prevent too abrupt a transition (e.g., maintaining emissions at their current level, then reducing them to zero in

[32] *See* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *supra* note 30 (blue lines, vertical arrows, and labels added by author).

2030).[33] Consider, for example, the common goal of reducing carbon emissions by about 50% from 2020 to 2030, and then to net-zero by 2050.[34] A stylized version of such a reduction target is included in the left panel of Figure 2 below.[35] This graph is quite different from Figure 1. The x-axis shows time, and the y-axis shows annual (not cumulative) global carbon emissions. The blue target curve plots the annual reduction in emissions that would be necessary to stay within the 1.5°C carbon budget. The target space is constructed in a way that if we add up all the annual emissions on the target curve, they need to exactly equal the remaining carbon budget. Graphically, this means the light-blue area under the target curve equals the 500 $GtCO_2$ we calculated from Figure 1. This point is crucial because it underscores that climate targets do not merely specify a level of reductions to be attained at a distant point in time. To stay within the remaining carbon budget, the gradual year-by-year reduction specified in the target curve must take place. This point is demonstrated in Figure 2; meeting the long-term target will not prevent exceeding the target level of global warming if the carbon budget is overspent along the way.

The global carbon budget is the foundation of the alignment approach. Implicitly, every emissions reduction target (see Figure

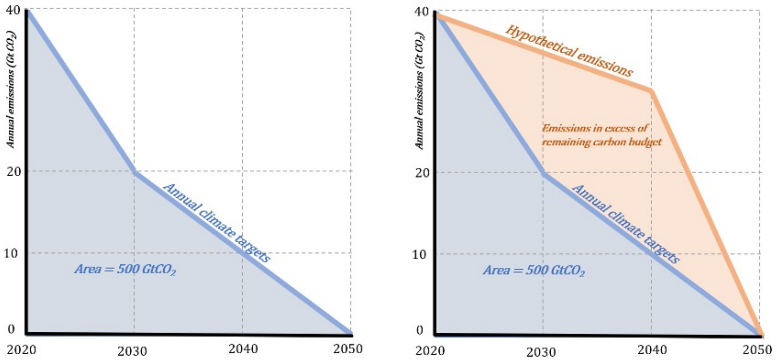
[33] In practice, the process of allocating the global carbon budget across time for a given warming threshold occurs as part of the development of representative concentration pathways (RCP) and shared socioeconomic pathways (SSPs). The SSP most closely aligned to 1.5°C is labeled SSP1-1.9 (*see supra* Figure 1). For the emissions trajectory under SSP1.9, *see* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *CLIMATE CHANGE 2021: THE PHYSICAL SCIENCE BASIS SUMMARY FOR POLICY MAKERS* 14 Table SPM.1 (2021), https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM_final.pdf. For a helpful introduction to the construction of RCPs and SSPs, *see* Zeke Hausfather, *Explainer: How 'Shared Socioeconomic Pathways' Explore Future Climate Change*, CARBONBRIEF (Apr. 19, 2018), https://www.carbonbrief.org/explainer-how-shared-socioeconomic-pathways-explore-future-climate-change.

[34] *See* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *supra* note 30, at 59 (noting that the reduction is for 43% from 2019 to 2030); *id.* at 19 (indicating that modelled pathways that limit warming to 1.5°C require net zero by the early 2050s).

[35] For expositional simplicity, Figure 2 omits a number of aspects included in IPCC target spaces. For the non-stylized version, see INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *supra* note 30, at 59. Note that this version refers to all greenhouse gases rather than CO2e alone. 2050 emissions remain at a low, but non-zero, level (this likely takes into account natural carbon sinks).

2) is based on a corresponding carbon budget for a given temperature (see Figure 1). The main benefit of the alignment approach is the way in which it links the activities of individual actors to scientific climate targets. The next two parts of the Article demonstrate how that link is made in practice.

Figure 2: Stylized Climate Target for 1.5°C



II. ALLOCATING THE GLOBAL CARBON BUDGET

The carbon budgets published by the IPCC are global, meaning they apply to the planet as a whole, rather than to specific actors. But in and of itself, a global carbon budget is of limited use. Actual emissions are driven by countries, corporations, and households. To be operative, the remaining carbon budget needs to be allocated to those actors. This allocation is a policy challenge of the first order. It is important to appreciate how much more difficult and controversial this step is than merely calculating the global carbon budget. Calculating the global carbon budget is scientifically complex but ultimately enjoys a broad consensus within the scientific community. In contrast, allocating the remaining carbon budget requires policymakers to make diverse judgements rooted in politics, law, economics, ethics, engineering, and so forth. These judgements are bound to be controversial. This gap between the carbon budget and its allocation has been a persistent challenge to climate action.

A. *The Paris Agreement and Allocation to Countries*

Consider the Paris Agreement as a case in point. A key goal of the Paris Agreement is to allocate the remaining carbon budget between the signatory countries. One approach to achieve this goal would have been for each country to reduce its emissions at the global reduction rate discussed above (the "equal reduction approach").[36] For example, if aiming for the more ambitious 1.5°C target, each country would need to cut its emissions by about 50% by 2030, and to net-zero by 2050.[37]

Note how the act of setting a target essentially allocates a share of the global carbon budget to each country. The graph showing the annual targets for each country would be a scaled-down version of the graph showing global targets in Figure 2 (left panel). Instead of having a 2020 value of 40 $GtCO_2$ (global carbon emissions), it would have the relevant country's emissions figure for that year, but the shape of the curve would look exactly the same. Remember that the area under the target curve (like Figure 2) equals the remaining carbon budget. The same concept can be applied to the target curve of an individual country (or corporation). If we do the math, we see that with 50% reduction by 2030, and net-zero by 2050, each country gets cumulative emissions over the three decades that are about 11 times its base year (2020) level.[38] To take a concrete example, if the U.S. has 2020 emissions of about 4,000 million tCO_2[39], it is

[36] In the literature, the equal reduction approach is commonly referred to as "grandfathering." *See* Nicole Van Den Berg et al., *Implications of Various Effort-Sharing Approaches for National Carbon Budgets and Emission Pathways*, 162 CLIMATIC CHANGE 1805 (2020), https://doi.org/10.1007/s10584-019-02368-y.

[37] *See* Figure 2. To be sure, the emphasis on 1.5°C (the bottom of the Paris range) would have been premature in 2016.

[38] 7.25 times the base year can be spent in 2021–2030, and only 4.75 times the base year in 2031–2050. Author's calculations available online at https://o365coloradoedu-my.sharepoint.com/:x:/g/personal/naor2878_colorado_edu/EVfKo7NDNH1Ak16iY9JCOCYB6SaakuOICXXuxfL-aYLhLg?e=zTMSjw; *see also* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *supra* note 30.

[39] *See* EPA, INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990–2020, EXECUTIVE SUMMARY ES-4 Table ES-2 (2022), https://www.epa.gov/system/files/documents/2022-04/us-ghg-inventory-2022-chapter-executive-summary.pdf (noting 2020 carbon emissions of about 4,715 million tCO_2, minus 812 million tCO_2 in LULUCF Carbon Stock Change). Note that this

allocated a total of about 44 $GtCO_2$ over the entire three decades (=4,000 million tCO_2 *11) out of the remaining carbon budget of 500 $GtCO_2$.

As noted, every time we set a target, we allocate a share of the remaining carbon budget. But different target-setting methods follow different principles, so the resulting allocations will be different as well. Under the equal reduction approach just described, all targets are identical. Mathematically, this means countries are allocated a share of the remaining carbon budget based on their share of global carbon emissions in the base year (here, 2020). If the U.S., emitted about 9% of global emissions in 2020, it gets about 9% of the remaining global carbon budget of 500 GtCO2.[40] Researchers sometimes refer to this approach as "grandfathering," capturing the way in which it turns an existing share of emissions into what is essentially a kind of carbon entitlement.[41]

This equal reduction approach ignores disparities between countries and turns out to be a political non-starter. Countries vary in their economic and technological capacity to decarbonize, in the intensity of their emissions relative to population size, and in their historical contribution to global emissions.[42] By way of example, the U.S. and India are both large emitters of greenhouse gases.[43] But the U.S. GDP per capita is nearly 10 times that of India; its greenhouse gas emissions per capita are greater by a factor of about 6,

is a net emissions figure, excludes non-CO_2 GHGs, and refers to 2020, whereas U.S. Paris Agreement NDCs use 2005 as the base year).

[40] Our figures are stylized, and so do not fully reconcile, but you can see they come close. 9% of 500 $GtCO_2$ equals 45 $GtCO_2$ relative to our calculation of 40 $GtC0_2$.

[41] Anders Bjørn et al., *From the Paris Agreement to Corporate Climate Commitments: Evaluation of Seven Methods for Setting 'Science-based' Emission* Targets, 16 ENV'T. RSCH. LETTERS 1, 8 (2021), https://iopscience.iop.org/article/10.1088/1748-9326/abe57b.

[42] *See Per Capita Greenhouse Gas Emissions*, OUR WORLD IN DATA, https://ourworldindata.org/grapher/per-capita-ghg-emissions (last visited Dec. 23, 2024) (showing emissions per capita); *see also* Hannah Ritchie, *Who Has Contributed Most to Global CO2 Emissions?*, OUR WORLD IN DATA (Oct. 1, 2019), https://ourworldindata.org/contributed-most-global-co2 (indicating country share of historical emissions).

[43] *See* Hannah Ritchie and Max Roser, *CO2 Emissions: How CO2 Does the World Emit? Which Countries Emit the Most?*, THE WORLD IN DATA (Jan. 2024), https://ourworldindata.org/co2-emissions.

and its contribution to historical emissions is greater by a factor of 7.[44] It is virtually inconceivable that the two countries would need to adopt targets requiring them to decarbonize their economies at the same rate.

The Paris Agreement (Art. 2) acknowledges this point in the principle known as "common but differentiated responsibilities and respective capabilities" ("CBDR-RC").[45] According to CBDR-RC, the responsibilities for implementing the Paris Agreement should take into consideration the "…respective capabilities [of the signatories], [and be made] in the light of different national circumstances."[46] Under CBDR-RC, developing countries should be allowed to decarbonize slower than they would under the equal reduction approach.[47] Note however that allowing a slower rate for developing countries would involve an over-spending of the carbon budget, and failure to meet the Paris climate targets. For the system to work, developed countries would need to make up for those lost carbon reductions.

Figure 3 provides a stylized picture of how CBDR-RC may be applied. The purple area in Figure 3 (left panel) represents emissions in excess of the global carbon budget resulting from slower decarbonization by developing countries, while the green area represents emission levels below the global carbon budget from faster decarbonization by developed countries. For the carbon budget to be maintained, the green area must at least equal the purple area. Unlike the equal reduction, with the CBDR-RC, individual country

[44] The U.S. and India GDP per capita (purchasing power parity, 2024) is $86,600 and $11,110, respectively. *See* IMF DATAMAPPER, *GDP Per Capita, Current Prices*, INT'L MONETARY FUND, https://www.imf.org/external/datamapper/PPPPC@WEO/OEMDC/ADVEC/WEOWORLD (last visited Apr. 25, 2025). For emissions per capita, *see Per Capita Greenhouse Gas Emissions*, *supra* note 42 (viewing 2023 data); for cumulative contribution to emissions, *see* IMF DATAMAPPER, *Cumulative CO_2 Emissions by World Region*, INT'L MONETARY FUND, (viewing "Cumulative CO_2 emissions by world region", 2023 data).

[45] Paris Agreement, *supra* note 25.

[46] *Id.* art. 4.3 (applying specifically to emissions reduction targets).

[47] *See id.* While the focus of this Article is with emissions reduction targets, it is worth noting that under the Paris Agreement, CBDR-RC is a general principle that applies to all of the signatories' obligations under the agreement. Important applications outside of emissions reduction targets include technology transfers, and finance. *See, e.g.*, *id.* art. 9, 10.

targets do not look like a scaled-down version of global targets, but go above or below global targets. That, of course, leaves the question of just how far above and below countries can go. Decarbonizing is challenging, so assuming the global carbon target can be met in aggregate, every country would want the policy flexibility to decarbonize slower rather than faster. Developing countries would want a system with greater variance from global targets (to secure greater flexibility), while developed countries want a system with less variance (to reduce the loss of flexibility in their own targets).[48]

The choice as to how much variance is an obvious political choice about allocating the remaining carbon budget—and hence the burdens of decarbonization—between the Global North and South. Over the years, different quantitative methods have been proposed to incorporate CBDR-RC into national targets. Those include measures that seek to equalize per capita carbon emissions or take into account a country's ability to pay based on its GDP.[49] Nevertheless, the Paris Agreement signatories were not able to agree upon a formula to translate CBDR-RC into national targets. Lacking such agreement, the Paris signatories opted instead for a system of "Nationally Determined Contributions" (NDCs), where each signatory sets its own target.[50] The NDC system provides flexibility to individual countries, but lacks a mechanism to ensure the global carbon math works out.[51] To date, the NDC system has failed to produce

[48] Note, however, the significance of the relatively large and growing share of annual global GHG emissions by developing countries. *Cumulative CO_2 Emissions by World Region, supra* note 44. Mathematically, the greater that share, the deeper and faster reductions by developed countries must be (relative to the required global reduction rate) in order to afford a given level of flexibility to developing countries. This aspect adds to the political challenges of applying CBDR-RC through national carbon targets. It also highlights the need to apply CBDR-RC in additional avenues, like technology transfers and climate finance. *See* Paris Agreement, *supra* note 25, art. 9–10.

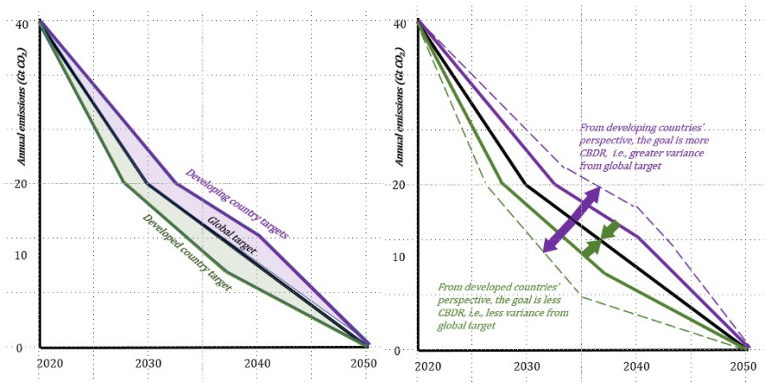
[49] For a discussion of different approaches that can achieve the principle of CBDR-RC in setting NDCs, *see* Van Den Berg et al., *supra* note 36, at 1809.

[50] *See* Paris Agreement, *supra* note 25, art. 4.

[51] Meanwhile, in Ireland, the Climate Change Advisory Council (CCAC) has been considering a quantitative "Paris test" which formally assesses the country's NDC in light of CBDR-RC. Conceptually, such an approach, if it were adopted globally, should allow global carbon math to add up. For discussion and critique, *see* Barry McMullin et al., *Defining a 'Paris Test' of National Contribution to*

sufficient commitments to stay within the global carbon budget, even within a 2°C limit.[52] Such are the challenges of allocation.

Figure 3: How CBDR-RC Should Work in Principle



B. *SBTi and Allocation to Corporates*

The allocation of the remaining carbon budget across countries is only the beginning of our difficulties. Most carbon is emitted by corporations and households. Governments can of course enact regulatory measures and provide incentives.[53] But the record of climate action over the past decades has shown how difficult those are to achieve at the necessary scale and speed. Despite early enthusiasm for carbon taxation and other forms of carbon pricing, the share of global emissions covered by such measures is only 23%, and the price on carbon in most jurisdictions falls significantly below expert recommendations.[54] The EU, and to some extent, the UK, appear to

Global Climate Mitigation: the Irish Exemplar, 19 ENV'T. RESCH. LETTER 1, 1–4 https://iopscience.iop.org/article/10.1088/1748-9326/ad3660/pdf.

[52] *See* U.N. ENVIRONMENT PROGRAMME, EMISSIONS GAP REPORT 2023: BROKEN RECORD—TEMPERATURES HIT NEW HIGHS, YET WORLD FAILS TO CUT EMISSIONS (AGAIN) XXI, Figure ES.4, https://wedocs.unep.org/bitstream/handle/20.500.11822/43922/EGR2023.pdf?sequence=3&isAllowed=y.

[53] *See* Michael Pappas, *The Structure of U.S. Climate Policy*, 83 MD. L. REV. 347 (2024).

[54] *See* WORLD BANK GROUP, STATE AND TRENDS OF CARBON PRICING 8, 21 (2023), https://openknowledge.worldbank.org/entities/publication/58f2a409-9bb7-4ee6-899d-be47835c838f (demonstrating through Figure 3 that most countries

be the only major economies where carbon pricing has both considerable coverage and is set at recommended ranges.[55]

Meanwhile, in the U.S., frustration with the difficulties of legislating policy "sticks" (such a making carbon expensive) led the Biden Administration to opt for policy "carrots"—subsidies—in the 2022 Inflation Reduction Act (IRA).[56] While subsidies are more popular than sticks, they are difficult to provide on the necessary scale, particularly in the Global South (as of this writing, even in the U.S., IRA subsidies are coming under pressure during the Second Trump Administration).[57] The alignment approach to climate policy emerged out of the growing realization that national policies by themselves are insufficient to reach Paris targets. The logical step was to try to establish voluntary reduction targets for corporations, analogous to the NDCs countries make under the Paris Agreement.

As applied to corporations, a climate alignment commitment refers to a company voluntarily adopting a target to reduce its emissions at a rate consistent with the Paris Agreement. Unfortunately,

fall below the carbon price corridor). On the positive side, the share of global emissions covered by carbon pricing has about tripled over the past decade. *See id.* at 8).

[55] *See id.* at 21.

[56] *See* Pappas, *supra* note 53, at 3; Josh Bivens, *The Inflation Reduction Act Finally Gave the U.S. a Real Climate Change Policy*, ECON. POL'Y INST. (Aug. 14, 2023), https://www.epi.org/blog/the-inflation-reduction-act-finally-gave-the-u-s-a-real-climate-change-policy/.

[57] On his first day in office, President Trump signed Executive Order (EO) 14154, *Unleashing American Energy.* Unleashing American Energy, Exec. Order No. 14154, 90 Fed. Reg. 8353 § 2, (Jan. 20, 2025), https://www.federalregister.gov/documents/2025/01/29/2025-01956/unleashing-american-energy. The order immediately paused disbursement of funds appropriated under the IRA and revoked an earlier Biden Administration EO implementing the legislation. *See* Unleashing American Energy, 90 Fed. Reg. 8353 § 7, § 4(xi). EO 14154 sparked a whirlwind of litigation from states and private parties. *See* Columbia L. Sch. Sabin Ctr. for Climate Change & Env't Def. Fund, *Inflation Reduction Act Tracker*, COLUMBIA L. SCH. SABIN CTR. FOR CLIMATE CHANGE, https://iratracker.org/litigation/ (last visited May 23, 2025); Woonasquatucket River Watershed Council v. U.S. Dep't of Agric., No. 1:25-cv-00097, 2025 WL 1116157 (D.R.I. Apr. 15 2025). While plaintiffs have received some early relief, the future of IRA incentives is still uncertain. *See* Woonasquatucket, 2025 WL 1116157. For additional analysis focused on tax credit aspects, *see* Nadya Britton & Natalie Runyon, *IRA's Uncertain Future: How the Trump Administration's Approach Could Impact Corporate Tax Functions*, REUTERS (Feb. 27, 2025), https://www.thomsonreuters.com/en-us/posts/corporates/ira-uncertain-future/.

the first generation of corporate climate targets has been marred in greenwashing and controversy.[58] The Science-Based Targets Initiative, widely known as SBTi, grew as a response to those controversies. SBTi is a nonprofit affiliated with organizations such as the United Nations (U.N.), the World Wildlife Foundation (WWF), and the World Resources Institute (WRI).[59] Since 2015, SBTi has been developing technical standards that specify the requirements for a corporation to declare a "science-based target" (SBT). SBTi's rise over the past years has been meteoric. The organization has grown from a start-up to a global standard setter.[60] According to 2023 data, over 4,000 companies have approved SBTi targets, or have committed to setting such targets, a sharp increase from only 546 companies in 2020 and 10 companies in 2015.[61] These 4,000 companies represent some 39% of global market capitalization.[62] The ranks of SBTi include some of the world's largest and wealthiest companies such as Apple, Microsoft, Walmart, McDonald's, Nestlé, Volkswagen, General Motors, and Procter & Gamble.[63] SBTi's brand has become nearly synonymous with corporate social responsibility in the climate arena. By its own assessment, as well by that of others, SBTi is the "gold standard . . . defining the pathway to reduce corporate greenhouse gas (GHG) emissions."[64]

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[58] *See, e.g.*, UNITED NATIONS' HIGH-LEVEL EXPERT GROUP ON THE NET-ZERO EMISSIONS COMMITMENTS OF NON-STATE ENTITIES, INTEGRITY MATTERS: NET-ZERO COMMITMENTS BY BUSINESS, FINANCIAL INSTITUTIONS, CITIES, AND REGIONS (Nov. 2022), https://www.un.org/sites/un2.un.org/files/high-levelexpertgroupupdate7.pdf.

[59] *See* SBTi, *Who We Are*, SCI. BASED TARGETS, https://sciencebasedtargets.org/about-us.#who-we-are (last visited Dec. 23, 2024).

[60] *See* Ian Morse, *Inside the Little-Known Group Setting the Corporate Climate Agenda*, MIT TECH. REV. (May 16, 2023), https://www.technologyreview.com/2023/05/16/1073064/inside-the-little-known-group-setting-the-corporate-climate-agenda/.

[61] For 2023 data, *see* SBTI, MONITORING REPORT 2023 10 (2024), https://sciencebasedtargets.org/resources/files/SBTiMonitoringReport2023.pdf.

[62] *See* SBTI, *supra* note 1, at 8.

[63] *See Companies Taking Action*, SBTI https://sciencebasedtargets.org/companies-taking-action (last visited Apr. 25, 2025).

[64] *See* Alberto Carrillo Pineda et al., *Understand the Methods for Science-Based Climate Action*, SBTI (Feb. 25, 2021), https://sciencebasedtargets.org/news/understand-science-based-targets-methods-climate-action; Ben Payton, *Analysis: Surge in Net-Zero Pledges Causes Growing Pains for Corporate*

One of the key questions SBTi standards address is how fast relative to global reduction targets should companies decarbonize for their targets to be considered "science-based." As our discussion above demonstrates, deciding that question amounts to allocating a share of the remaining carbon budget to specific companies. SBTi, in short, has set out to provide the private sector with an answer to the same question that the Paris Agreement did not manage to answer for its signatories.

SBTi's technical standards answer this question by providing two main approaches, known as the absolute contraction approach (ACA), and the sectoral decarbonization approach (SDA).[65] A detailed discussion of these approaches is provided below, but it is important to point out from the outset that neither of the approaches seems to meaningfully incorporate CBDR-RC-RC. This concern was recently expressed by Price et al.:

> The so-called 'science based targets' being adopted by business do not take account of equity in any way that is aligned with literature-justified interpretation of fair sharing based on CBDR-RC principles. Instead, they unfairly grandfather additional carbon budget share to corporate actors based on current sectoral emissions shares, emissions or revenues.[66]

When Price et al. speak of "unfairly grandfather[ing] additional carbon budget share to corporate actors" based on "emissions" and "sectoral emissions shares," their concerns reflect the allocation

Climate Targets Group, REUTERS (Sept. 5, 2023), https://www.reuters.com/sustainability/boards-policy-regulation/analysis-surge-net-zero-pledges-causes-growing-pains-corporate-climate-targets-2023-08-30/; Harun, *Science Based Targets Achieve Gold Standard Status*, E+E LEADER (May 27, 2021), https://www.environmentenergyleader.com/stories/science-based-targets-achieve-gold-standard-status,7046.

[65] *See,* Pineda et al., *supra* note 64. To see the approaches in the context of SBTi criteria, *see e.g.*, SBTI, SBTI CRITERIA AND RECOMMENDATIONS FOR NEAR-TERM TARGETS 13 (Version 5.1, 2023) [hereinafter SBTI, NEAR-TERM TARGETS], https://sciencebasedtargets.org/resources/files/SBTi-criteria-v5.1.pdf. In SBTi criteria, the ACA and SDA are generally synonymous with "cross-sector" and "sector-specific" labels respectively. There are a number of other target-setting approaches allowed by SBTi that are outside the scope of this Article.

[66] *See* Paul R. Price et al., *Carbon Budgets to Inform Climate Action: A Society-wide, Integrated GHG Quota and Accounting Perspective* 39 (Climate Change Advisory Council, Working Paper No. 19, 2023), https://www.climatecouncil.ie/councilpublications/councilworkingpaperseries/Paul%20R%20Price%20Working%20Paper%20No%2019.pdf.

principles under the ACA and SDA respectively.[67] We take these in turn.

The ACA is a simple approach, which requires but a brief discussion. Under the ACA, a company calculates emissions in a baseline year (e.g., 2020) and is required to reduce these emissions at the rate of the global reduction target. The target reduction rate is based on IPCC 1.5°C carbon budget and corresponding global targets in the manner described in Part I (in some cases, SBTi also allows companies to set targets based on the IPCC WB2C carbon budget).[68] Note that the ACA is essentially the equal reduction approach that the Paris Agreement rejected as inconsistent with CBDR-RC. It leads to the underwhelming result that some of the world's largest and wealthiest companies are required to cut their emissions at the same rate as, say, a rural region in a developing country. The approach suffers from the same basic problems that countries rejected in Paris. Namely, it is based on a grandfathering principle which treats present emissions essentially as an entitlement.

The SDA provides the second and more complex approach to allocation. The SDA is a methodology that pertains to high-emitting sectors, including power, oil and gas, transport, steel, cement, forest and agriculture, maritime shipment, aviation, and so forth.[69] The SDA grew as a response to the limitations of the ACA. The features that made the equal reduction approach challenging for the Paris signatories also make its equivalent, the ACA, challenging for the private sector. Companies work in different sectors that have different carbon intensities. Each sector faces different economic and technological opportunities to reduce its emissions. As a result, a quantitative target that might be easily attainable to a company in one sector, could be nearly impossible for a company in another sector. The SDA

[67] *Id.* Allocation based on revenues is a less common approach under SBTi and falls outside the scope of this Article.

[68] *See, e.g.*, SBTI, PATHWAYS TO NET-ZERO, *supra* note 3, 1–4. As noted in *supra* note 3, while current SBTi guidelines require 1.5°C alignment, many legacy targets were issued under WB2C alignment.

[69] *See* SBTI, SECTORAL DECARBONIZATION APPROACH (SDA): A METHOD FOR SETTING CORPORATE EMISSION REDUCTION TARGETS IN LINE WITH CLIMATE SCIENCE Table of Contents, 71, 81, 85, 94 (2015) [hereinafter SBTI, SDA (2015)] (Note: while the document has become outdated, it helpfully explains SBTi's basic methodology for sectoral target development); *See also*, *Standards and Guidance*, SBTI, https://sciencebasedtargets.org/sectors (last accessed April 26, 2025).

addresses this challenge by differentiating targets by sector. Under the SDA, each sector is first assigned its own "sectoral carbon budget."[70] SBTi derives the sectoral carbon budget from technical work by scientists, engineers, and economists in expert bodies.[71] One of these prominent expert bodies is an intergovernmental organization called the International Energy Agency, or "IEA."[72]

Consider the following example using the steel sector.[73] Growth in the demand for steel, together with challenges of decarbonizing steel production, mean that the steel sector cannot decarbonize at the pace required by the global carbon budget for 1.5°C.[74] IEA publishes technological pathways that project the future output of steel, and the amount of decarbonization in the steel sector that it considers cost-feasible.[75] By taking other economic sectors into consideration, IEA ensures that the carbon budget allocated to the steel sector adds up with all other sectors so as not to exceed the global carbon budget.[76] In other words, IEA is doing across sectors what CBDR-RC is supposed to do across countries. Using IEA's work, SBTi would then issue a special guidance for the steel sector.[77]

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[70] SBTi, SDA (2015), *supra* note 69, at 20–21.

[71] *See id* at 21.

[72] *Id.* For use of IEA scenarios in early SDA methodologies, *see* SBTI, SDA (2015), *supra* note 69, at 7; for current uses, see *infra* notes 77 and 153.

[73] *See* SBTI, STEEL SCIENCE-BASED TARGET-SETTING GUIDANCE 1 (2023) [hereinafter, SBTI, STEEL GUIDANCE], https://sciencebasedtargets.org/resources/files/SBTi-Steel-Guidance.pdf.

[74] *See* INT'L ENERGY AGENCY, IRON AND STEEL TECHNOLOGY ROADMAP: TOWARDS MORE SUSTAINABLE STEELMAKING 68 (2020), https://iea.blob.core.windows.net/assets/eb0c8ec1-3665-4959-97d0-187ceca189a8/Iron_and_Steel_Technology_Roadmap.pdf (discussing hard-to-abate status of the steel sector); *see id.* at 57 (discussing growth in demand for steel).

[75] *See id.* at 68–88; *see also* INT'L ENERGY AGENCY, NET ZERO BY 2050 126, 129, 199–200 (2021), https://iea.blob.core.windows.net/assets/deebef5d-0c34-4539-9d0c-10b13d840027/NetZeroby2050-ARoadmapfortheGlobalEnergySector_CORR.pdf (containing output and emissions tables).

[76] *See, e.g.*, INT'L ENERGY AGENCY, NET-ZERO BY 2050: A ROADMAP FOR THE GLOBAL ENERGY SECTOR 199–200 (2021) (noting especially Table A.4, at 199 and Table A.5, at 200). *See also* INT'L ENERGY AGENCY, *supra* note 74.

[77] *See* SBTI, STEEL GUIDANCE, *supra* note 73.

Corporations in a sector with a guidance must follow that guidance, i.e., they cannot use the cross-sectoral ACA approach.[78]

SDA targets typically look different from those under the ACA (equal reduction) approach. ACA targets are absolute, meaning they are set directly in metric tons of CO_2. In contrast, SDA targets often[79] use "intensity targets" that divide a company's absolute emissions (tCO_2) by a physical unit: a ton of steel for the steel sector, a kilowatt of power for the power sector, etc.[80] For example, using IEA's work, SBTi would calculate a baseline emissions intensity for the steel sector, e.g., 2.42 tCO_2 / ton of steel for 2020.[81] It would also calculate the reduction pathway that the steel sector would need to follow, e.g., 1.71 tCO_2 / ton of steel for 2030, 0.77 tCO_2 / ton of steel for 2040, and so forth.[82] Using these figures, a steel producer with 2.42 tCO_2 / ton of steel in 2020 would have an intensity target of -29% by 2030.[83] In practice, steel manufacturers adopting the target all start with different carbon intensities of production, that may be above or below the sector's 2020 baseline intensity. SBTi has an online tool that calculates their convergence path to the required intensities in the sectoral pathway.[84] That tool ensures that the steel sector as a whole remains within the carbon budget allocated to it by IEA.[85]

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[78] *See, e.g.*, SBTi, NEAR-TERM TARGETS, *supra* note 65, at 16 (noting particularly C24: Requirements from sector-specific guidance).

[79] While SBTi sectoral guidance for most industries requires companies to adopt intensity targets, there are specific industries where the sectoral guidance allows absolute targets. See, e.g., SBTi, APPAREL AND FOOTWEAR SECTOR SCIENCE-BASED TARGET GUIDANCE 3, [hereinafter SBTi APPAREL GUIDANCE], https://sciencebasedtargets.org/resources/files/SBT_App_Guide_final_0718.pdf (last visited Apr. 26, 2025). In instances where absolute targets are adopted, the concerns in Part II.B subsections (1) and (2) of this article still apply, but the concern in Section (3) does not.

[80] *See* SBTi SDA (2015), *supra* note 69, at 18.

[81] *See* SBTi STEEL GUIDANCE, *supra* note 73, at 62 (noting that these figures are for 100% ore-based).

[82] *See id.* at 19.

[83] -29% = (2.42–1.71)/2.42. Figures on the left-hand side of equation are in tCO2/ton of steel for years 2020 (2.42) and 2030 (1.71).

[84] *See* SBTi, SDA (2015), *supra* note 69, at 19. For a sample tool, *see* note 118, infra.

[85] Mathematically, this is done by requiring companies whose base year emissions intensity is above (below) the sector average to converge faster (slower) towards the intensity target than is required by the sectoral pathway. *See* SBTi, SDA

With this basic description in place, we turn to several controversies that can arise with respect to SDA. In all these controversies, science is a valuable starting point, but cannot provide the full answer. The controversies include: (i) sectoral budget size, (ii) the role of regional differentiation, and (iii) the use of intensity targets.

1. Sectoral Budget Size

The allocation of the carbon budget across sectors is a complex task that can be performed using different methods. Different methods can lead to different sized carbon budgets in different sectors. As we have seen, the larger (or smaller) the carbon budget, the slower (or faster) the sector would need to decarbonize. In this way, sectoral allocation has distributive outcomes across sectors, and indirectly, across countries and populations affected by those sectors. The considerations IEA (and other expert bodies) use when allocating the sectoral carbon budget can be subject to expert disagreement. Any such disagreement would be embedded in SBTi's guidance for the sector that uses the underlying expert work. Consider the aviation sector as an example. Aviation is considered to be a "hard-to-abate" sector, given the relative lack of low-cost carbon abatement options. Demand for aviation is also expected to grow dramatically over the coming decades. The conventional wisdom is that with few alternatives, and growing demand, the aviation sector's share of the global carbon budget would also need to grow over time relative to other sectors. In a recent Expert Report, Peeters and coauthors (2023) challenged this logic. [86]

The Expert Report voices concern with the way that so-called "cost abatement optimization" models lead to an over-allocation of the global carbon budget to the aviation sector.[87] To minimize the overall economic costs of the climate transition, these models create a ranking order of sectors in terms of their abatement costs (e.g., the cost of producing a marginal megawatt from renewable rather than

(2015), *supra* note 69, at 28–30. Where companies subject to SDA targets do not disclose their convergence path, readers may simulate that path by plugging the company's base year emissions intensity into the relevant SDA tool (but see *infra* note 120 below for other factors influencing the convergence path).

[86] *See* PAUL PEETERS ET AL., KLM, SCIENCE-BASED TARGETS, AND THE PARIS AGREEMENT (Dec. 4, 2023), https://pure.buas.nl/ws/portalfiles/portal/32555525/Peeters_Buijtendijk_Eijgelaar_ExpertReport_v4_Final.pdf.

[87] *Id.* at 26–27.

fossil fuel sources).[88] The lower the sectoral cost of abatement, the easier it is for the sector to decarbonize, the smaller the share of the global carbon budget that sector is allocated by the model.[89] Meanwhile, to avoid the higher costs in hard-to-abate sectors like aviation, these sectors would receive a larger share of the budget. The Expert Report challenges this logic as inconsistent with the principles of climate justice.[90] One key issue is that cost optimization models take for granted the demand for flying, and its future growth. Incorporating growing demands for flights into model assumptions could lead to prioritization of the consumption patterns of affluent demographics at the expense of the broader population. Thus, according to the Expert Report (2023):

> A question is whether the sheer difficulty to find strong enough technical mitigation options for a certain sector enabling to combine unlimited economic growth with zero-emissions in 2050 is a strong enough reason for allowing that sector a larger share of the carbon budget. SBTi, IEA, the International Air Transport Association (IATA), and others seem to simply accept this way of thinking. They simply weigh the cost of abatement for a growing amount of volume produced by a sector. The SDA method of SBTi uses this logic, as it essentially divides global allowable emissions between sectors in a 'cost optimal' way, hence attempting to minimise global transition costs…[91]

However,

> … Because air travel serves mainly rich people, and because the necessity of many flights is particularly questionable as reported by frequent flyers (almost half of the flights was reported to be not necessary…), one could question whether air travel should grow based on an assumption of unlimited amounts of SAF [sustainable aviation fuels], the production of which requires high shares of resources, feedstocks and renewables. . . In other words: the fact that aviation is hard to abate is not a convincing argument to let aviation take a larger share of the global carbon budget and tries to avoid the discussion about curbing growth of aviation out of the discussion about zero-emissions aviation. . .[92]

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88 *See id.* at 26.

89 *See id.* at 26–27.

90 *See id.* at 3.

91 *Id.* at 26.

92 *Id.* at 27.

The critique is a powerful one. A sectoral budget allocation based on cost of abatement optimization is not merely the product of climate science and engineering alternatives. In the case of aviation, it is based on economic assumptions that individual costs of affluent consumers reflect a social cost that needs to be minimized. That is essentially a political or normative assumption.

To be sure, the allocation of sectoral budgets by bodies like the IEA is more complex than the image of a pure cost-optimization model may suggest.[93] Pathways may allocate sectoral budgets by combining different methodological approaches. For example, NZE2050, the flagship IEA pathway, incorporates the U.N.'s sustainable development goals.[94] Those include quantitative targets for energy access, air pollution and health outcomes.[95] The NZE2050 also incorporates behavioral changes that are meant to drive down emissions by reducing certain economic activities. Those behavioral changes include measures to slow the rapidly growing demand for aviation.[96]

The methodological complexity of these pathways makes it challenging to assess the various normative considerations and their relative weight. Each sectoral pathway requires careful analysis regarding these methodological choices. Such analysis could be challenging for all but the most technical readers. The need for a greater understanding of these normative considerations has been

[93] For a helpful discussion of the methodological issues, *see* Andres Chang et al., *Comment on 'From the Paris Agreement to Corporate Climate Commitments: Evaluation of Seven Methods for Setting "Science-based" Emission Targets'*, 17 ENV'T RSCH. LETTERS 038002 (2022), https://iopscience.iop.org/article/10.1088/1748-9326/ac548c; *see also* Anders Bjørn, et al., *supra* note 10. Respectively, these sources provide SBTi response to Bjørn et al., *supra* note 41, and the authors' response to that comment.

[94] *See* INT'L ENERGY AGENCY, *supra* note 75, at 49.

[95] *See id.* at 167–169.

[96] *See id.* at 84–85. Note, however, that the SBTi aviation guidance is based on pathways that are different from IEA NZE2050, such that the demand assumptions in those pathways need to be consulted independently. For example, under its 2023 interim pathway for aviation, SBTi chose the ICCT Breakthrough Scenario, which has an assumed annual activity growth rate (2019–2050) of 2.9%, greater than the NZE2050 rate of 2.5%. *See* SBTI, TECHNICAL REPORT: THE SBTI INTERIM 1.5C SECTOR PATHWAY FOR AVIATION 4 (2023), [hereinafter: SBTI, AVIATION INTERIM PATHWAY (2023)] https://sciencebasedtargets.org/resources/files/1.5C-Aviation-Interim-Technical-Report-Final.pdf.

highlighted by Bjørn et al. (2022) as part of a technical study of SBTi's target setting methods:

> … [W]e find it important that SBTi (and developers of individual SBT methods) communicates the normative assumptions that are embedded in the adopted scenarios. Indicating only the level of granularity (global, regional or sectoral) will likely prevent companies and other stakeholders from fully understanding the value judgments and associated subjectivity embedded in a chosen scenario.[97]

2. Regional Differentiation

So far, our discussion has focused on the allocation of a portion of the carbon budget to a sector as a whole. But within each sector, companies operate in different regions. Under the principle of CBDR-RC, we would expect that, within a given sector, companies in developed countries would need to decarbonize faster than companies in developing countries (all things equal). SBTi does not share that position, instead noting that the sectoral targets should only be derived from global (rather than regional) carbon budgets: "The SDA method does not take into account considerations of equity or fairness across different countries."[98] This means that while SBTi acknowledges sectoral differences between a steel manufacturer and an electric utility, an electric utility in the U.S. and its Indian counterpart would have the same "science-based" target, requiring the same level of reduction.[99]

In part, SBTi's position seems to reflect the view that "equity issues [are] less relevant" for large multi-nationals with regionally diversified activities.[100] This argument is only partially convincing. It is true that equity issues are relatively "less relevant" for a regionally diversified company compared to a purely domestic one. But they could still be quite relevant in absolute terms. McDonalds's operations are global, but at the same time, they are heavily tilted

[97] Bjørn et al., *supra* note 41, at 3.

[98] SBTi, SDA (2015), *supra* note 69, at 38 (mentioning as in note 69 above, this document has been superseded by specific sectoral guidance documents, but provides an important high-level description of SBTi's approach to sectoral target setting).

[99] For a discussion of SBTi's overall approach to regional differentiation in sectoral targets, see SBTi, SDA (2015), *supra* note 69, at 38.

[100] *Id*.

towards the developed world.[101] Certainly, many multinationals can segment their activities by region and apply regionally specific targets within a given sector.[102]

Other challenges to regional differentiation in sectoral targets might be more technical in nature. For example, the underlying expert work that SBTi relies on only includes global (rather than regional) pathways for many relevant sectors.[103] Nevertheless, important regional pathways do exist, and those can be incorporated into targets. For example, power is typically generated and consumed locally and is regionally differentiated in the most important IEA scenarios.[104] Figure 4 below provides an illustration of the vast regional differences in the speed of power sector decarbonization under IEA's SDS (2020) scenario (note that SBTi Power Sector Guidance uses a different pathway, but the basic point is similar).[105] As the figure demonstrates, developed countries begin with an intensity baseline of 0.36kgCO2/kWh in 2019, nearly half that of developing countries. As late as 2030, the targeted intensity of developing countries (0.32 kgCO2/kWh) is just slightly under that of developed countries a decade before. The figure also demonstrates that global intensity targets would lag behind those developed

[101] *See* MCDONALD'S CORPORATION, 2023 INVESTOR UPDATE FACT SHEETS 3–4 (2023), https://corporate.mcdonalds.com/content/dam/sites/corp/nfl/pdf/20231202_Investor%20Update%20Fact%20Sheet.pdf.

[102] One could also argue that as a U.S. corporation, McDonalds's global emissions should be subject to the higher developed country standard, i.e., that the target should follow the corporation's "passport." To be science-based (in the SBTi sense), such a hypothetical approach would need to ensure that the different target rates for corporations with different passports add up to required reductions under the relevant carbon budget.

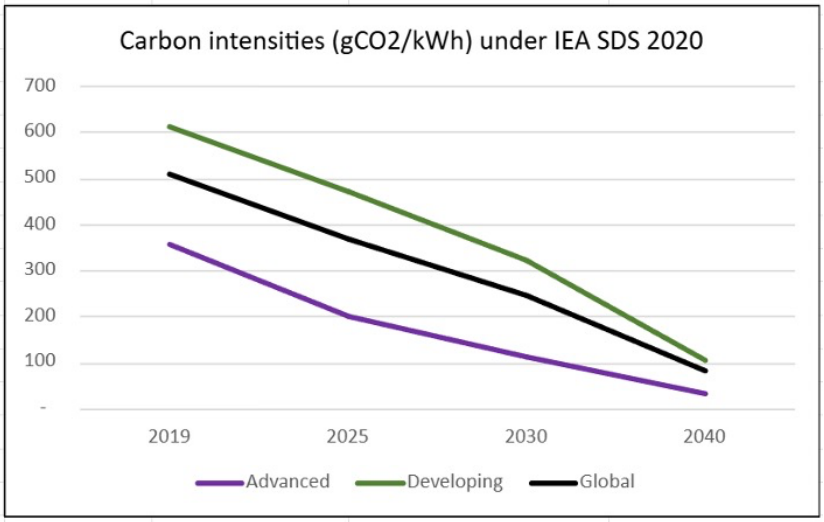
[103] For example, the data product for IEA's flagship NZE2050 scenario is provided at a global level. *See* INT'L ENERGY AGENCY, NET ZERO BY 2050, *supra* note 75. For the data product, *see* Int'l Energy Agency, *Net Zero By 2050 Scenario: Figures and Data Along with Projections at Global Level for the Net Zero Emissions by 2020 Scenario* (May 2021), https://www.iea.org/data-and-statistics/data-product/net-zero-by-2050-scenario.

[104] For power pathways with regional differentiation, *see generally World Energy Outlook 2020*, INT'L ENERGY AGENCY (2020), https://iea.blob.core.windows.net/assets/a72d8abf-de08-4385-8711-b8a062d6124a/WEO2020.pdf. Country-by-country and region-by-region differentiation for the power sector is available in the spreadsheet annex cited in note 107 below.

[105] *See World Energy Outlook 2020*, *supra* note 104.

countries by about five years. Despite these vast differences, power sector targets remain global under the SBTi guidance.[106]

Figure 4: Regionally Differentiated Emissions Intensities under IEA SDS (2020)[107]



	Developed economies	Developing economies	Global
2019	0.36	0.61	0.51
2025	0.20	0.47	0.37
2030	0.12	0.32	0.25
2040	0.03	0.10	0.08

[106] *See* ANDRES CHANG ET AL., SETTING 1.5°C-ALIGNED SCIENCE-BASED TARGETS: QUICK START GUIDE FOR ELECTRIC UTILITIES 7–8 (2020), https://sciencebasedtargets.org/resources/legacy/2020/06/SBTi-Power-Sector-15C-guide-FINAL.pdf. The guidance uses a different scenario. For this pathway, SBTi apparently chose a non-IEA scenario called MESSAGE-GLOBIOM Low Energy Demand scenario. It is not clear whether that specific scenario provides regional differentiation. However, IEA power sector scenarios are widely used.

[107] For a spreadsheet documenting author's calculations, *see Author's Calculations*, https://o365coloradoedu-my.sharepoint.com/:x:/g/personal/naor2878_colorado_edu/EaAaTkpQu8dKkTU3uQA6g_sBYuZvgyHeLUn-5O2eIxSC-g?e=RJeah8); For underlying data, *see World Energy Outlook 2020: Annex A Tables for Scenario Projections*, https://o365coloradoedu-my.sharepoint.com/:x:/g/personal/naor2878_colorado_edu/ERns8SuufOZBnlOcoe6aTd8BI9I3At3GHFDp5ftuENANEg?e=iwxgaj (last visited Apr. 26, 2025).

There is one exception where SBTi provides regional differentiation in sectoral targets. That exception is SBTi's recent guidance for the Forest, Land, and Agriculture (FLAG) sector.[108] This exception raises an interesting question about the relationship between regional differentiation and CBDR-RC. Under the guidance, SBTi requires producers of agricultural commodities to use targets that are based on regional pathways encompassing 26 regions.[109] Thus, producers of rice in Japan, China, or central Asia would be subject to different intensity targets. The question that arises is whether that differentiation incorporates the principle of CBDR-RC. Intuitively, the answer is "yes"—because producers in different regions are subject to different targets—but a more accurate answer requires some nuance.[110]

There are different ways in which regional pathways can be created for each sector. For example, a pathway can be developed based on the different emissions profiles of rice in different regions, and the different cost of abatement of those emissions. That model would be regionally specific, but it still does not reflect a distributive decision to allocate a greater portion of the carbon budget to developing countries. Indeed, depending on emissions and cost parameters, the model may require faster decarbonization in the developing world. So, while regional differentiation is a necessary condition for CBDR-RC, it is not a sufficient condition. To assess whether regional differentiation truly incorporates CBDR-RC, one needs to understand the normative choices made in the model beyond consideration of local cost and emissions features. For example, that could include the countries' development goals, food security, biodiversity, etc. As noted in the discussion above,

108 *See* JACOB CARL, RESEARCH MEMO ON FLAG GUIDANCE 4–5 (July 2024), https://o365coloradoedu-my.sharepoint.com/:w:/g/personal/naor2878_colorado_edu/EQf9QJQ4CwZIv480TngUN98BhJlD1SPs55a6wRurPEJYyQ?e=dalvtm.

109 *See* CM. Anderson et al., *Forest, Land and Agriculture Science-Based Target-Setting Guidance*, SBTI 42 (2023) [hereinafter SBTI FLAG GUIDANCE], https://sciencebasedtargets.org/resources/files/SBTiFLAGGuidance.pdf; *see also Forest, Land and Agriculture*, SBTI, https://sciencebasedtargets.org/sectors/forest-land-and-agriculture#resources (last visited Apr. 26, 2024).

110 To be clear, SBTi does not claim commodity pathways embody CBDR-RC.

understanding the normative consideration behind a given model can be quite a technical and challenging task.

3. Risks of Intensity Targets

A third controversy around SDA concerns the potential hazards of intensity targets. To understand the difference between intensity and absolute targets more intuitively, we may use the analogy of measuring a vehicle's performance. Instead of focusing on the total gas consumption (absolute measure), we can measure its gas mileage, i.e., the number of miles the vehicle travels per one gallon of gas (intensity measure). Under an absolute target, absolute emissions must decline by a given rate. E.g., if your car emitted 5 tCO2 in 2020, it must emit no more than 2.5 tCO2 in 2030. Under an intensity target, the absolute emissions can vary. For example, say you got a hybrid with twice the gas mileage of your old car (good), but you also started a job with a longer commute and now drive three times the milage (not so good). In this case, you will be able to meet a 50% intensity target even though your absolute emissions would actually increase by 50%.[111] That is a problem. After all, the global carbon budget is measured in absolute levels of GHGs. The atmosphere takes no comfort in the fact that we humans get more bang (economic activity) for our buck (emissions).

Not all intensity targets are problematic. Recall that expert bodies like IEA project the total output in different sectors (e.g., MW of power, tons of steel, miles driven), and allocate to each sector a portion of the remaining carbon budget (the sectoral budget). SBTi derives sectoral intensity targets by dividing each sectoral budget by the sector's total output.[112] As long as IEA's projected level of output holds true, intensity targets will not overspend the sectoral budget. Consider a stylized example with a sector consisting of only two companies, A and B. In 2020, Company A and Company B each produce 100 widgets and have 100 tCO2 in emissions, i.e., 2020 intensity 1tCO2-per-widget (=200tCO2/200 widgets). Assume, hypothetically, that IEA's scenario for 2030 projects an increased production of 300 widgets, and allocates a sectoral budget of only 150

[111] If baseline emissions were 5 tCO2, the tripling of distance and cutting of intensity by half would lead to emissions of 7.5tCO2 (=5 tCO2*3/2). This reflects a 50% increase in absolute emissions from baseline.

[112] *See* SBTi SDA (2015), *supra* note 69, at 8.

tCO2. Based on IEA's work, SBTi would calculate a 2030 sectoral intensity target of 0.5tCO2-per-widget (=150tCO2/ 300 widgets).

Now assume that in 2030, both companies achieved their intensity target, but their market share changed: Company A increased its production to 250 widgets while Company B cut its production to only 50 widgets. Note that Company A's absolute emissions have actually gone up from 100 tCO2 (2020) to 125 tCO2 (2030; =250*0.5tCO2-per-widget). But in this example, this absolute increase in Company A's emissions is not problematic because it is counterbalanced by an absolute decrease in Company B's production and emissions to only 50 widgets and 25tCO2 (=50*0.5tCO2). Thus, total sector emissions would equal 150 tCO2e, which exactly equals the IEA sectoral budget. The key thing to appreciate is that as long as total sector production does not exceed the IEA projection (150 widgets), intensity targets work as well as absolute targets.

Indeed, in this situation, an intensity target works even better than an absolute target. It facilitates a comparison of a company's climate performance (by taking into account their production levels), and it allows the most efficient companies to grow without being subject to absolute target caps.[113]

The problem is that we do not always know that the carbon math will in fact hold up. We can end up in situations where the sector as a whole meets the intensity target, but overshoots the level of output assumed in its sectoral carbon budget. To use another car example, this would be like the sectoral pathway for cars assuming miles driven by cars would only double by the target year, but drivers triple the number of miles they drive in practice. For a real-world example, we can revisit the aviation sector. In a previous section, we discussed the concern that sectoral aviation targets took for granted a rapid growth rate in flights (leading to an over-generous sectoral budget). A distinct and additional concern is that airlines are likely to overshoot the (already high) growth assumptions in the sectoral carbon budget. The Dutch bank ABN AMRO has expressed this concern recently in its review of a sustainability-linked bond issued by Air-France-KLM

[113] *See*, *e.g.*, Benn Gruitt, *Absolute Emissions vs. Carbon Intensity*, WORKIVA (June 26, 2023), https://www.sustain.life/blog/absolute-emissions-carbon-intensity.

("KLM").[114] KLM's sustainability-linked bond includes an intensity target validated by SBTi.[115] ABN AMRO's quantitative analysis found that projections of growth in flight activity for KLM, and the aviation sector as a whole, far outstrip the growth reduction measures in the IEA's NZE2050 scenario.[116] As a result, ABN AMRO found that KLM's intensity target, when "…translated into an absolute emission figure does not seem to align with the Paris Agreement."[117]

In principle, SBTi's SDA methodology tries to account for, and mitigate, the risk that rapid growth in activity levels would compromise the integrity of intensity targets. Specifically, when companies submit SDA targets for validation, they are required to provide forecasted company activity growth.[118] Where those forecasts outpace forecasted sector growth—and thus exceed the carbon budget—SBTi tries to compensate for the excess emissions by requiring faster decarbonization.[119] For example, in near-term targets, the company's 2030 intensity target would remain identical, however, the company would need to converge to that target at a faster rate than required for companies with average growth forecasts (sufficiently faster to

[114] *See* ABN-AMRO, SUSTAINAWEEKLY DECONSTRUCTING AIR FRANCE-KLM'S SLB FRAMEWORK 3–4 (Jan. 9, 2023), https://assets.ctfassets.net/1u811bvgvthc/6byj0REJAN6YdVe3je1xiK/9838139cab2ddb13f5024a227976d3dd/Sustainaweekly_9_January_2023_-_ENG.pdf. For the relevant SBTi guidance, *see* SBTI, SCIENCE-BASED TARGET SETTING FOR THE AVIATION SECTOR (2021) [hereinafter SBTI, AVIATION GUIDANCE]. A more recent SBTi aviation guidance is discussed in note 116 below.

[115] *See* NICK KOUNIS, DECONSTRUCTING AIR FRANCE-KLM'S SLB FRAMEWORK 2–4 (2023).

[116] *See id.* at 4 ("Based on the chart above, we can estimate that according to the IEA, (i) CAGR for RPK [revenue passenger kilometers] between 2019–2030 needs to be around 1.7%, which is significantly lower than ICAO [International Civil Aviation] (6.3%) and equity analyst (4.2%) estimates . . ."). In a more recent interim aviation sector pathway released by SBTi, an RPK growth rate of 2.9% is used for the period 2031–2050 per the ICCT Breakthrough Scenario. *See* SBTI, AVIATION INTERIM PATHWAY (2023), *supra* note 96, at 3, 4.

[117] ABN-AMRO*, supra* note 114, at 4.

[118] *See e.g.*, *Air Transport* Sector, SBTI, https://sciencebasedtargets.org/sectors/aviation (last visited Apr. 26, 2025) (select "Download Version 2 of the target setting tool" then select the "Airlines" tab and find the data in "Activity data in target year").

[119] *See* SBTI, AVIATION GUIDANCE, *supra* note 114, at 9 (noting that the steepness of the convergence path is defined, among other things, by the "rate of forecasted company activity").

compensate for the excess activity).[120] While this approach works in theory, it is unlikely to perform well in practice. For one, as discussed below, there is little transparency regarding the documentation that companies submit to SBTi, and consequently, little ability to monitor underestimates in activity growth forecasts.[121] Second, a company may not disclose that its required convergence path was accelerated due to high activity growth forecasts, making it difficult to keep the company accountable. ABN AMARO's analysis of the KLM target demonstrates the lack of appropriate measures to ensure integrity around activity levels in SBTi's current policies.

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In summarizing SBTi's approach to budget allocation, it is helpful to review its key strengths and weaknesses. The main strengths are the use of the scientific global carbon budget as a point of departure, and the allocation of that global budget to specific companies. The allocation can be made using simple rules, as in the ACA, or it can be made in a more complex fashion as in the SDA. The former has the benefit of being easily understandable, and the latter benefits from the credibility of the expert engineering and economic work on which it relies. Either way, the targets resulting from the process create a system where each company has a clear share of GHG reductions to pursue, and hence, can claim to be doing its share. This combination of individual targets and reliance on technical expertise lends SBTi its own credibility as the gold standard of corporate target setting.

Meanwhile, a fundamental weakness of the SBTi approach is the appearance of a scientific answer to a question that inherently cannot be answered by science. Science determines the remaining carbon budget, but cannot allocate it. That was the original dilemma the Paris Agreement signatories could not resolve. SBTi faces what is essentially the private sector equivalent of that dilemma. The allocation rules SBTi has chosen are surely informed by science and other expert knowledge. But they are equally based on normative choices that go beyond science. In this light, the authority that these

[120] For a methodological discussion of this approach, *see* SBTi, SDA (2015), *supra* note 69, at 29–31.

[121] *See infra* text adjacent to note 247.

(largely understated) normative choices enjoy as "science-based" seems excessive. This excess in authority can sometimes raise climate-washing concerns. But before we turn to those, we need to address another key component of the climate alignment approach: carbon accounting.

III. ACCOUNTING FOR EMISSIONS

The next task of a target framework concerns the all-important question of emissions accounting. Allocating a share of the remaining carbon budget to a company assumes that we can say what entity is responsible for which emissions in the first place. This is harder than it sounds. GHG accounting rules are not merely about creating a physical inventory of emissions. They are about assigning responsibility for these emissions to specific entities. Much like the global carbon budget cannot allocate itself, a physical inventory of GHG emissions cannot declare who is responsible for which CO_2 molecules. That task lies within the domain of policy, not science. Determining accounting rules requires policy judgements and normative considerations that are beyond mere reliance on science.

This insight is significant because corporate climate targets are based on an organization's GHG inventory. An inventory that is under-inclusive is essentially a watered-down target. For example, an organization's commitment to reduce its tCO_2 in emissions by 50% by 2030 may sound impressive, but the significance of this commitment depends on the scope of responsibility that GHG accounting rules assign to that organization in the first place. Where accounting rules define a corporation's responsibility for emissions narrowly, reducing 50% of a small amount might be a lot less impressive than it first appears. A key claim of this Part is that conceptually, there is no way to think of a climate target independent of the underlying accounting rules.

A. *The Three Scopes of Emissions*

To familiarize ourselves with the challenges of GHG accounting, consider the following example of emissions arising from power generation through natural gas. Natural gas is extracted by an oil and gas (O&G) company and is burned to generate power by an electric utility. Electricity from the utility is consumed by a manufacturer as part of its production process. The manufacturer then sells its products to other firms. The question is: who should account

for the emissions associated with burning the natural gas? Until we answer that question, we cannot know who would be responsible for reducing these emissions if any one of the companies involved had a climate target.

Carbon accounting rules are prescribed by the widely used Greenhouse Accounting Protocol (the "GHG Protocol").[122] Like SBTi, the GHG Protocol is a nonprofit organization, and U.S. companies may generally choose to follow its standards, or not, on a voluntary basis.[123] A company choosing to do so would report its emissions in an annual greenhouse gas inventory following the Protocol's detailed standards. Voluntariness aside, the GHG Protocol is to carbon accounting what standard-setting bodies like FASB (author of the U.S. GAAP) and IASB (author of the IFRS) are to general accounting.

To answer the question of who should account for given emissions, the GHG Protocol distinguishes between three different "scopes" of emissions in an organization's GHG inventory. These different scopes provide the essential building blocks for climate targets. Briefly, Scope 1 refers to GHG emissions from equipment that an organization owns or controls directly, Scope 2 refers to emissions from generation of electricity or heat that an organization purchases, and Scope 3 refers to indirect emissions, produced up and down the organization's value chain.[124] Thus, in our example, emissions from burning natural gas would be reported as follows in Table 1:

Table 1: The Three Scopes of Emissions

[122] *Standards*, GREENHOUSE GAS PROTOCOL, https://ghgprotocol.org/standards (last visited Apr. 26, 2025).

[123] *See* EPA, *Key Voluntary and Regulatory Frameworks*, EPAhttps://www.epa.gov/climateleadership/key-voluntary-and-regulatory-frameworks (last visited Apr. 26, 2025). Note that while the SEC Climate Disclosure Rule would have required companies to make certain GHG inventory disclosures, that rule is unlikely to be implemented as of this writing. *See* Mark T. Uyeda, *Acting Chairman Statement on Climate-Related Disclosure Rule*, SEC. EXCH. COMM'N (Feb. 11, 2025), https://www.sec.gov/newsroom/speeches-statements/uyeda-statement-climate-change-021025.

[124] *See* WORLD BUS. COUNCIL FOR SUSTAINABLE DEV. & WORLD RES. INST., THE GREENHOUSE GAS PROTOCOL: A CORPORATE ACCOUNTING AND REPORTING STANDARD 25 (Mar. 2004) [hereinafter GHG PROTOCOL CORPORATE STANDARD], https://ghgprotocol.org/sites/default/files/standards/ghg-protocol-revised.pdf.

	Scope 1	Scope 2	Scope 3
O&G company			Scope 3 (downstream),[125] because emissions are associated with natural gas sold by the O&G company.
Electric utility	Scope 1, because the utility owns the plant where emissions occurred.		
Manufacturer		Scope 2, because the manufacturer consumes the electricity that it purchased from the emitting facility.	
Companies consuming the product			Scope 3 (upstream), because emissions incurred to produce the purchased product.

While Scopes 1 and 2 are relatively straightforward to measure,[126] Scope 3 has proven more challenging. Understanding that challenge is important because, for the average company, Scope 3 accounts for the vast majority of its emissions.[127] The Scope 3

[125] In order to simplify, the example abstracts from fugitive emissions of methane in the extraction process. Those would be classified as "Scope 1" for the O&G company, as they are associated with owned equipment.

[126] *See infra* Part III.C.3 for the discussion of difficult conceptual issues around market-based approaches for Scope 2 measurement.

[127] *See Zero in on… Scope 1, 2 and 3 Emissions: What You Need to Know*, DELOITTE (May 12, 2021), https://www2.deloitte.com/uk/en/focus/climate-change/zero-in-on-scope-1-2-and-3-emissions.html ("For many businesses, Scope 3 emissions account for more than 70 percent of their carbon footprint"). According to the NewClimate Institute, Scope 3 emissions accounted for 90% of

challenge is two-fold. First, there is data. Value chains stretch far and wide, so collecting emissions data from upstream suppliers and downstream consumers can require considerable effort. Fortunately, in recent years, data limitations have been relaxed by the work of the Carbon Data Project (CDP).[128] CDP is a non-profit that centralizes emissions data and makes it available to its members (it is also one of the founding members of SBTi).[129] Private vendors have also emerged to support companies through granular analysis of Scope 3 categories.[130]

The second challenge is more fundamental and involves the type of conceptual dilemmas that would be familiar to lawyers. Consider the following example. When a guest is flying to stay at a resort, should their air-travel emissions be counted in the hotel's Scope 3 (downstream) inventory? That is, are these air-travel emissions sufficiently associated with the service that the hotel is providing to be considered part of the hotel's value chain? Switching perspectives, assume that a company is paying for an employee's stay at a hotel as part of business travel. The construction and operation of the hotel involve considerable emissions. Should a portion of these emissions be attributed to the company paying for the room under its Scope 3 (upstream) inventory?

Like CBDR-RC, these questions cannot be answered on a purely scientific basis. They are not merely about creating an inventory of physical emissions, but about assigning responsibility for specific physical emissions to specific organizations. Responsibility is based on a normative determination that there is a sufficient link between the organization's activities and the relevant emissions. In jargon, we refer to this link as the "operational boundary."[131]

emissions for most of the companies reviewed in their report. *See* CCRM 2024, *supra* note 5, at 21.

128 *See* CDP, https://www.cdp.net/en (last visited Apr. 24, 2025) (describing CDP's work in detail).

129 *See About Us*, SBTi, https://sciencebasedtargets.org/about-us (last visited Apr. 26, 2025).

130 *See, e.g.*, SIEVO, https://sievo.com/ (last visited Apr. 24, 2025).

131 For a discussion on operational boundaries, *see* GREENHOUSE GAS PROTOCOL, WORLD BUS. COUNCIL FOR SUSTAINABLE DEV. & WORLD RES. INST., CORPORATE VALUE CHAIN (SCOPE 3) ACCOUNTING AND REPORTING STANDARD 59 (Sept. 2011) [hereinafter GHG Protocol Scope 3 Standard], https://ghgprotocol.org/sites/default/files/standards/Corporate-Value-Chain-Accounting-

Defining the operational boundary is a little like determining the scope of liability for negligence in Torts. It is a complex exercise combining rules, policy heuristics, and discretion. The GHG Protocol's Scope 3 Standard defines 15 distinct Scope 3 categories, and has to define minimum operational boundaries for each.[132] Returning to the hotel example, under the GHG Protocol, guests' air-travel emissions will not be included in the hotel's minimum operational boundary, nor will the hotel's emissions be included in the guest company's minimum operational boundary.[133] These outcomes are arguably quite problematic.[134]

The complexities around Scope 3 led the GHG Protocol to make its Scope 3 Standard optional.[135] With Scope 3 accounting for the lion's share of most companies' emissions, this result is far from ideal. To see why, return to the gas emissions example in Table 1. A key insight from that table is the overlapping nature of responsibility for what are essentially the same physical emissions.[136] With Scope 3 accounting, the emissions are booked in four distinct inventories: the O&G company, the electric utility, the manufacturer, and the consumer companies. In legal terms, we may think of this arrangement as joint and several liability for the emissions, where every party is liable for the entire amount. Just as in other legal

Reporing-Standard_041613_2.pdf; for Scope 3 minimum boundaries, see *id.* at 35–57.

[132] *See id*. at 34.

[133] *See id.* at 46–47.

[134] While the focus here is on the Scope 3 minimum boundary in a corporate context, it is interesting to note that similar questions of responsibility arise with respect to GHG accounting by national and local governments. *See* Zeke Hausfauther, *Mapped: The World's Largest CO2 Importers and Exporters*, CARBONBRIEF (July 5, 2017), https://www.carbonbrief.org/mapped-worlds-largest-co2-importers-exporters/; *CBEI basics*, USDN, https://sustainableconsumption.usdn.org/climate/cbei-guidebook/cbei-basics#what (last visited Apr. 26, 2025).

[135] *See* GHG Protocol Scope 3 Standard, *supra* note 131, at 6.

[136] For this reason, aggregating Scope 3 emissions of different companies can involve double-counting and does not lead to meaningful results. Put differently, if one were to add all reported Scope 3 emissions in a given year, the total amount would exceed global carbon emissions by multiples. For discussion of Scope 3 aggregation issues, *see* Condon, *supra* note 21. The same principle applies to Scope 2, because all reported Scope 2 emissions are also the Scope 1 emissions of a power seller. Scope 1 emissions are the only emissions that accurately aggregate to total global emissions.

contexts, there can be good reasons to require this overlapping responsibility.

One key benefit of Scope 3 is coverage. Scope 3 allows us to reach out to Scope 1–2 emissions of companies and individuals that are not themselves covered by targets. The easiest way to see why is to assume Scope 3 did not exist. Recall that as a definitional matter, every Scope 3 (or even Scope 2) emission, is also booked in someone else's inventory as a Scope 1 emissions (to see why, return to Table 1). For this reason, the sum of all Scope 1 emissions should perfectly total the atmospheric scientists' inventory of physical emissions. If every person and entity in the world were covered by a climate target, we could—conceptually—cover all the physical emissions that go into the atmosphere with nothing but Scope 1 targets. As it goes, not every person and company is covered by a target. So, if we only had Scope 1 targets, there would necessarily be gaps in emissions that those targets cover. By having Scope 3 (and Scope 2) we are able to get to emissions of entities that are not covered by a Scope 1 target. This is a little like the benefits of joint and several liability when some, but not all, defendants are judgement proof.[137] In the case of SBTi, Scope 1–2 emissions (end of 2022 data) amounted to 2 GtCO2e.[138] That is only 5% of current annual global emissions of about 40 GtCO2e.[139] Meanwhile, Scope 3 emissions of companies with SBTi targets are likely to be greater than Scope 1–2 emissions by a factor of about 9, meaning they can dramatically increase the share of global emissions covered under targets.[140] Whether or not Scope 3 is included therefore makes a significant difference in target coverage.

[137] Thus, including Scope 3 in targets is one of the strategies that can be used to address so-called "leakage." *See* Lin, *supra* note 18, at 161.

[138] *See* SBTi, SBTi MONITORING REPORT 2022: LOOKING BACK AT 2022 AND MOVING FORWARD TO 2023 AND BEYOND 20 (Aug. 2023), https://sciencebasedtargets.org/resources/files/SBTiMonitoringReport2022.pdf ("This graph shows the scope 1 and scope 2 emissions covered by 1,279 companies with approved targets as of December 2022.").

[139] *See* Emissions Database for Global Atmospheric Research, *supra* note 31.

[140] Note, however, that we cannot calculate the exact percentage given the overlapping nature of Scope 3 emissions. For the factor of 9 (Scope 3/Scopes 1–2), *see* CCRM 2024, *supra* note 127. The finding is only made with respect to the subset of companies included in the CCRM.

A second benefit of Scope 3 concerns incentives for climate action. Overlapping responsibility for Scope 3 means that multiple parties would have incentives to reduce the same emissions (if those parties are subject to targets). Harnessing the incentives of different parties is key because different parties can mobilize different emission reduction strategies. Consider the case of transportation. Emissions from an internal consumption engine (ICE) vehicle are the vehicle owner's Scope 1 emissions. That vehicle owner may pursue some strategies like carpooling, taking a bike to work, etc. Meanwhile, an auto manufacturer would classify emissions from an ICE vehicle it sold as (downstream) Scope 3 emissions. That manufacturer can shift its production to electric vehicles (EVs). A local government may also include transportation emissions in its public GHG inventory and have the ability to increase public transportation options, engage in more pedestrian friendly urban planning, etc. This shows that climate action that combines a multitude of strategies can be far more effective than climate action that only relies on strategies available to small subset of actors (e.g., those reporting Scope 1 emissions). Overlapping responsibility means the burden of achieving a certain result is spread more evenly across people with different resources. This is a little like potential defendants knowing they may be jointly and severally liable for each other's actions, and therefore cooperating to prevent liability from materializing.

B. *Scope 3 Under SBTi*

One of the main achievements of SBTi has been the inclusion of Scope 3.[141] While Scope 3 reporting is optional under the GHG Protocol, SBTi requires that companies complete a Scope 3 inventory consistent with the Protocol's minimum operating boundaries.[142] That development marks important progress of SBTi relative to the older vintage of corporate climate targets. At the same time,

[141] *See e.g.,* SBTI, SBTI CORPORATE NET-ZERO STANDARD 32–33 (Version 1.2, Mar. 2024) [hereinafter SBTi Net-Zero Standard], https://sciencebasedtargets.org/resources/files/Net-Zero-Standard.pdf (including Scope 3 emissions).

[142] *See id.* at 25, 33, 35 (Companies are only required to include S3 in their targets if their S3 emissions exceed 40% of their total emissions—S1+S2+S3). *See also Scope 3: Stepping Up Science-based Action,* SCIENCE BASED TARGETS (Feb 20, 2023), https://sciencebasedtargets.org/blog/scope-3-stepping-up-science-based-action (reporting that "96% of SBTi-validated targets include scope 3 emissions").

there are a number of areas where important concerns arise with respect to Scope 3 emissions under SBTi. These include (i) boundary definitions, and (ii) looser treatment of Scope 3. We take these in turn.

1. Defining Boundaries

We begin by revisiting minimum operational boundaries. Under SBTi, Scope 3 definitions are generally based on the GHG Protocol, as discussed above.[143] As the hotel example suggests, at times these definitions may be overly narrow.[144] Numerous examples of this concern exist across the 15 Scope 3 categories. A few of these are:[145]

- Category 8 (Upstream leased assets): When a reporting company leases an asset (the lessee), it does not need to include the lifecycle emissions associated with that asset in its inventory. For example, a corporation leasing buildings, machines, or vehicles will not need to account for emissions that went into the construction or manufacturing of those assets. Many leases are set for long-term periods and have many of the functional attributes of ownership.
- Category 9 (Downstream transportation and distribution): When a reporting company sells its products or services to retail consumers, it does not need to include the customers' transportation-related emissions in its inventory. For example, a big-box store does not need to account for fossil fuels burned by customers on their way to and from the store.
- Category 14 (Franchises): When a reporting company grants a franchise (the franchisor), it would need to

[143] *See* SBTi Net-Zero Standard, *supra* note 141, at 22–23. In some cases, SBTi departs from the GHG Protocol Position. For example, SBTi requires that transporters of fossil fuels report the use-phase emissions of those fossil fuels, despite the fact those are not required by the GHG Protocol Scope 3 Operating Boundary.

[144] There is also the opposite risk, that a Scope 3 boundary would be defined too broadly. In such cases, a company may claim credit for emissions reductions that have little to do with its operations. *See e.g.*, CCRM 2024, *supra* note 5, at 61.

[145] *See* GHG Protocol Scope 3 Standard, *supra* note 131, at 34–37, Table 5.4, Categories 5, 8, 11, 14.

> include the franchisee's Scope 1–2 emissions in its inventory, but not its Scope 3 emissions. For example, a restaurant franchisor does not need to report the Scope 3 emissions associated with food supplies the franchisee purchases from third-party vendors.[146] To take another example, consider a sports team or university that (as franchisor) provides a trademark license to an apparel company (the franchisee) to use its brand on merchandize. The franchisor would not need to report the Scope 3 emissions associated with the raw materials required to produce the branded merchandize.

These examples all show that decisions about where to draw the Scope 3 minimum operational boundary can raise reasonable disagreements. As noted above,[147] in a way, such disagreements are analogous to debates over the different rates at which countries should decarbonize their emissions under the CBDR-RC principle. In both cases, there is consensus over *global* responsibility to cut emissions at a given rate, but disagreement as to who is responsible for the emission reductions. Further, in both cases, the controversy cannot be resolved authoritatively by referencing the scientific global carbon budget. At the same time, debates over minimum Scope 3 boundaries are even more challenging—and less transparent—than debates over CBDR-RC. The use of CBDR-RC in targets is relatively transparent. One can ascertain the extent to which CBDR-RC was taken into consideration by comparing the reduction rates required under different countries' targets (see Figure 3, right panel). Meanwhile, in making decisions about where to draw the Scope 3 minimum boundary, the focus is not on the rate of reduction, but rather on who is responsible for what emissions in the first place. It is a little like tax law. One way to reduce a tax burden is to reduce the tax rate on income. Another is to carve out an item from the definition of "income." The former is a lot more transparent than the latter. The target rate of reduction is like the (more transparent)

[146] To be clear, when the franchisor is also selling products to the franchisee, the franchisor would need to account for emissions related to sales under different rules.

[147] *See supra,* text adjacent to note 131.

tax rate while the definition of the minimum boundary is like the (less transparent) definition of income.

For concreteness, consider the example where a company's 2020 carbon emissions would be 2 million (M) tCO_2 under an accounting rule with a broader Scope 3 boundary (Rule 1), but only 1 $MtCO_2$ with an accounting rule with a narrower definition of that boundary (Rule 2). The company adopts a target requiring 50% reduction by 2030 from 2020 levels. The company's required reduction for 2030 would be 1 $MtCO_2$ under Rule 1, but only 0.5 million tCO_2 under Rule 2. If Rule 2 is adopted, a Rule 1 proponent would not consider the reduction of $0.5MtCO_2$ to be a 50% reduction aligned with a 1.5˚C pathway. Rather, they will consider it to be a 25% reduction (=$0.5MtCO_2$ / $2MtCO_2$) just barely aligned with a WB 2C pathway. Therefore, to a Rule 1 proponent, the choice of Rule 2 is a non-transparent way of cutting the target rate of reduction from 50% to 25%. This example shows that conceptually there is no way to think of the target rate of reduction independently of the underlying accounting rules. In assessing the adequacy of a given target, it is common to focus on the required rate of reduction, but it is just as important to understand the precise nature of the emissions that are included or excluded from the minimum operating boundary (and hence, from the target).

2. Looser Treatment of Scope 3

A second concern is the looser treatment of Scope 3 emissions under SBTi rules. While SBTi rules require companies to include Scope 3 emissions in targets, Scope 3 emissions are not treated the same as Scope 1–2 emissions. For a near-term target, companies are allowed to carve out a portion of their Scope 3 emissions from targets, and to reduce the remaining emissions at a slower rate.[148] Near-term targets are those made for a 5–10-year period (most corporations' 2030 targets are defined as "near-term targets"). "Long-term targets" are those longer than 10 years and typically run to 2050.[149] The looser treatment of Scope 3 emissions has two components.

[148] *See* SBTI, NEAR-TERM TARGETS, *supra* note 65, at 8 (C6); SBTI Net-Zero Standard, *supra* note 141, at 26; SBTi Net-Zero Standard, *supra* note 141, at 59.

[149] SBTI, NEAR-TERM TARGETS, *supra* note 65, at 12 (C13, R5); SBTI Net-Zero Standard, *supra* note 141, at 38 (C17).

First, for near-term targets, SBTi rules generally allow companies to exclude one third (33%) of their Scope 3 emissions, as opposed to only 5% for Scopes 1–2.[150] For long-term targets (typically, 2050), the treatment is more comparable: 5% exclusion for Scopes 1–2 and only 10% for Scope 3.[151] SBTi refers to the 33% exclusion in near-term targets as the "expansive boundary approach," a bit of a misnomer since the rule actually works to exclude rather than include emissions.[152] The so-called expansive boundary applies categorically to targets issued under the absolute contraction approach (ACA). For sectoral targets, each sectoral guidance needs to be consulted individually, as some guidances override SBTi's general criteria. In many sectoral guidances, including FLAG, Apparel, and Cement, the expansive rule is explicitly maintained.[153] Other guidances, including Steel and Land Transportation, require a more complete inclusion of Scope 3.[154]

Second, for near-term targets, the carbon budget with which Scope 3 targets have to align is less ambitious: a WB2˚C pathway for Scope 3, rather than a 1.5˚C for Scopes 1–2. For companies following the ACA, the lower ambition cuts the linear rate of reduction required by the targets from 4.2% to 2.5% per year, i.e., by about 40%.[155] For long-term targets, all scopes (1, 2, and 3) must align with 1.5˚C which requires a 90% reduction from baseline no later than 2050.[156] For targets following the sectoral approach, it is (again) important to check the application of this rule on a guidance-by-guidance basis.[157] As further discussed below, there is concern

[150] SBTi, NEAR-TERM TARGETS, *supra* note 65, at 8 (C6); SBTi Net-Zero Standard, *supra* note 141, at 26.

[151] SBTi Net-Zero Standard, *supra* note 141, at 26.

[152] *Id.* at 25.

[153] *See* SBTi, CEMENT SCIENCE BASED TARGET SETTING GUIDANCE 17 (2022) [hereinafter SBTi, CEMENT GUIDANCE], https://sciencebasedtargets.org/resources/files/SBTi-Cement-Guidance.pdf; SBTi APPAREL GUIDANCE, *supra* note 79, at 24; SBTi FLAG GUIDANCE, *supra* note 109, at 14.

[154] *See* SBTi, LAND TRANSPORT SCIENCE-BASED TARGET SETTING GUIDANCE 9–10 (2024); SBTi, STEEL GUIDANCE, *supra* note 73, at 35.

[155] *See* SBTi Net-Zero Standard, *supra* note 141, at 59.

[156] *See* SBTi, Net-zero Standard, *supra* note 141, at 19, 31, 41 n.40.

[157] For example, the SBTi Apparel Guidance maintains the permissible 33% exclusion of Scope 3 in near-term targets of 5 to 15 years. *See* SBTi APPAREL GUIDANCE, *supra* note 79, at 24.

that SBTi does not accurately reflect the lower ambition of WB2C alignment in near-term Scope 3 targets. SBTi seems to classify a company's overall target as 1.5˚C aligned, even when its Scope 3 target is only WB2˚C aligned.[158] This means that companies with large Scope 3 emissions may overstate the level of ambition of their targets.

We can assess the quantitative significance of the looser treatment of Scope 3 emissions through a stylized simulation in Figure 5 below. The graph presents the SBTi targets of two companies, Company A (Blue) and Company B (Orange). Both companies have base-year (2020) emissions of 100,00 tCO_2 and use the absolute contraction approach. However, Company A's emissions are classified as Scope 1–2, whereas Company B's emissions are classified as Scope 3. The graph then simulates the target pathway each company would need to follow under SBTi's Net-zero standard, which assumes 1.5C alignment.[159]

This figure allows us to draw significant observations. For the period 2020–2030, Company B's reductions are only about 40% those of Company A (92 tCO_2 relative to $219CO_2$).[160] The annual linear rate of reduction of emissions for Company B is only 1.68%, which is substantially slower than the 2.5% required for WB2˚C. Indeed, 1.68% is closer to the 1.23% rate of reduction corresponding to a 2˚C pathway, which falls outside the Paris Agreement target range.[161] Therefore, for the 2020–2030 period, it would be inaccurate to claim Company B's target is aligned with either a 1.5˚C or WB2˚C pathway.

Strikingly, the difference in required reductions between the companies remains significant even under long-term targets, where

158 *See*, *e.g.*, SBTi Net-Zero Standard, *supra* note 141, at 9, 30 (claiming the standard aligns with 1.5°C and describing WB2C ambition as acceptable for near-term Scope 3 targets).

159 *See* SBTi Net-Zero Standard, *supra* note 141, at 38 (C14 noting among other things that "[c]ompanies shall set one or more targets to reach a state of net-zero emissions, which involves: (a) reducing scope 1, 2 and 3 emissions to zero or a residual level consistent with reaching net-zero admissions at the global or sector level in eligible 1.5°C scenarios or sector pathways . . .").

160 Reductions calculated from baseline emissions on a cumulative basis.

161 *See* SBTi CORPORATE MANUAL, *supra* note 3, at 24 (noting that 1.23% linear reduction under ACA corresponds to 2C ambition; note that this version of the manual has been superseded, and 2C ambition is no longer acceptable by SBTi).

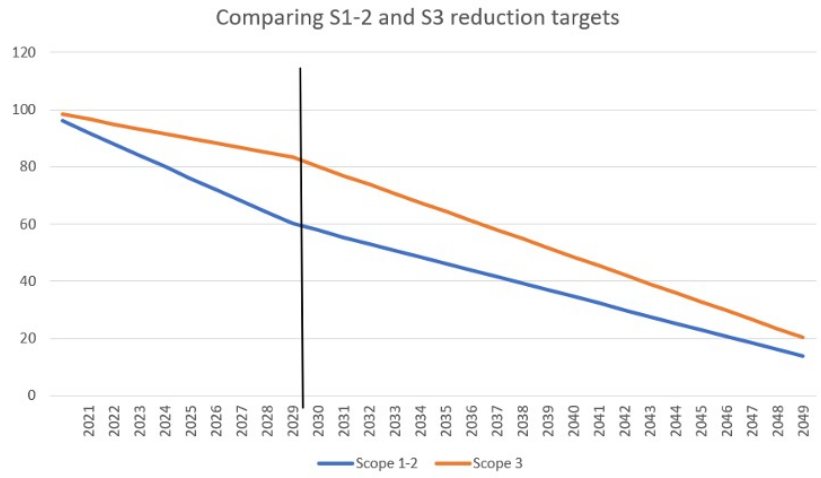
Scope 1–2 and Scope 3 emissions are treated in essentially identical ways under the SBTi rules. From 2030–2050, Company B would only need to make cumulative reductions of 896 tCO_2, which is 24% below the 1,184 tCO_2 reduction for Company A. What is causing this difference in the period where the rules for Scopes 1–2 and Scope 3 are similar? The looser treatment of Scope 3 under near-term targets means that by 2030, Company's B annual emissions are substantially higher than Company A's (83 tCO_2 and 60 tCO_2 respectively). Under the long-term target, both companies would need to cut their emissions to about the same level by 2050, but Company B's higher 2030 emissions means that it can reduce less, and emit more, along the way (this is similar to our discussion of Figure 2, right panel).[162] Over the entire three-decade period, Company B's cumulative emissions would be 28% greater than the 1.5C aligned Company A.[163] This difference is quantitatively substantial. It amounts to 40% of the remaining carbon budget between a 1.5˚C and WB2˚C targets.[164] While the rate of reduction required by Company B's 2020–2050 targets is still closer to a 1.5C remaining carbon budget than it is to a WB2˚C budget, the difference is large enough to make the claims of 1.5C˚ alignment problematic.

[162] Note that according to the SBTi's Net-Zero Standard, under the cross-sector pathway (absolute contraction), emissions are reduced 90% (rather than 100%) by 2050 from a 2020 baseline. After the target is met, the remaining 10% of emissions need to be neutralized through offsets. *See* SBTi Net-Zero Standard, *supra* note 141, at 18–19, 41 (C28).

[163] Note that difference would be smaller if Company B had significant Scope 1–2 emissions.

[164] The remaining carbon budget for WB2C (850 GtCO2) is only about 70% greater than that of 1.5C (500 GtCO2 — both budgets are given for 50% proabability). For figures, *see* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *supra* note 29, at 29 (Table SPM.2). The 40% calculation in the texts reflects 28% Company B exceedance relative to 1.5C carbon budget, divided by the 70% difference between the remaining carbon budgets for 1.5C and WB2C.

Figure 5: Comparison of Scope 1–2 and Scope 3 under SBTi Net-Zero Corporate Standard[165]



The discussion above suggests that looser treatment of Scope 3 under SBTi raises legitimate concerns.[166] For example, it may lead consumers to believe companies' targets follow a 1.5C reduction rate even when reductions across all three scopes—especially in near-term targets—may fall substantially short of that rate. At the same time, it is important to understand that the looser treatment of Scope 3 is not necessarily inconsistent with the scientific carbon budget in a formal or logical way. This distinction between scientific and other grounds for concern is significant for our later discussion of climate-washing. The following paragraphs address this distinction.

To better understand the relationship between Scope 3 and climate science, we first need to consider what SBTi means when it says that a company adopting a science-based target is doing its "fair-share" of global emissions reductions.[167] It seems to mean

[165] *See SBTi Expansive Boundary Approach*, https://o365coloradoedu-my.sharepoint.com/:x:/g/personal/naor2878_colorado_edu/EYvHINg-R2RLkj-cXBoIwzABBxuoUpi91BK7wLR-Bzrb2A?e=vMJw4z (last visited Nov. 19, 2024).

[166] *See infra* Part IV.C.2.

[167] *See, e.g.*, SBTi SDA (2015), *supra* note 69, at 34.

something like the following: in the counterfactual that all emitters adopted targets under the same set of SBTi rules, the necessary amount of reductions will be achieved at the global level. This approach is reminiscent of Kant's categorical imperative: "Act [i.e., set targets] only according to that maxim [the target rules] whereby you can at the same time will that it should become a universal law [targets to be followed by all emitters]."[168] Strangely, however, that categorical imperative would be satisfied even if companies only had Scope 1 targets, and no Scope 2 or Scope 3 targets. Recall that the three scopes create a regime of overlapping responsibility for the same physical emissions. The only physical emissions that add up to the global carbon budget are Scope 1 emissions. Everything else, whether it is Scope 2 or Scope 3, is about assigning responsibility to multiple companies for emissions that should have already been recorded in someone else's inventory as Scope 1. Therefore, in the counterfactual that all emitters were subject to targets, the necessary reductions could be obtained (in theory) even if targets only covered Scope 1. According to this approach, science clearly does not require Scope 3 targets, so *a fortiori*, looser treatment of Scope 3 is consistent with science.

In practice, however, most emitters with Scope 1 emissions are *not* covered by targets. Recall, for example, that according to recent data, Scope 1–2 emissions covered by approved SBTi targets are less than 5% of global annual emissions.[169] Therefore, the challenge of a target system like SBTi is not just to design moral rules for a counterfactual where all emitters were covered by targets, but for a practical reality where only a small subset of emitters are. Rather than trying to derive Scope 3 treatment from scientific principles, it is more useful to consider the policy tradeoffs that a body like SBTi faces in this situation. By requiring Scope 3 targets, SBTi substantially increases the portion of global emissions covered by its targets, which is a major policy benefit. At the same time, given the voluntary nature of the standard, the greater responsibility for Scope 3 emissions might lead some companies not to adopt the targets in the first place. That is a policy cost. SBTi's looser treatment of Scope 3 can be understood as a rough compromise between these

[168] IMMANUEL KANT, GROUNDWORK FOR THE METAPHYSICS OF MORALS 30 (James W. Ellington trans., Hackett 1993) (1785).

[169] *See* text adjacent to note 139, *supra* and citations there.

two heuristics. Lawyers often speak of the legislative process as a "sausage factory" when referring to similar compromises in bills.[170]

The discussion above suggests that SBTi's treatment of Scope 3 is not derived from the global carbon budget using scientific principles, but is a policy choice based on broad discretion. This is not an accident. The questions that Scope 3 presents are about assigning responsibility for emissions reductions to specific entities. By their very nature, these questions are allocative, not scientific. This observation informs our understanding of SBTi's role and potential climate-washing concerns around its targets. For example, while SBTi's looser treatment of Scope 3 raises significant concerns, those concerns are not the result of a tension with climate science per se. Therefore, in order to claim the looser treatment amounts to climate-washing, advocates need to articulate normative grounds that are different from inconsistency with science. In Part IV we will discuss some of these normative grounds. Before that, we turn to the last GHG accounting issue, carbon credits (and their cousins).

C. *The Role of Carbon Credits (and Their Cousins)*

The last accounting issue concerns the use of carbon credits.[171] This section also covers two additional concepts that can be seen as "cousins" of carbon credits: "carbon removals" and the "market-based method" for Scope 2 accounting. Carbon credits are a complex topic that falls somewhat outside the core concerns of this Article. Nevertheless, given the importance of carbon credits to the current policy debates around corporate targets, I wanted to show how some of the themes discussed above can be applied to them.

In a nutshell, carbon credits refer to emissions reductions that take place outside of a company's value chain, and that the company would like to use as an offset against its own emissions. A common example of carbon credits includes "nature-based solutions," e.g., projects to plant or conserve forests and sell credits representing the

[170] The saying supposedly dates back to Otto von Bismarck: "Laws are like sausages. Better not to see them being made." *See* Dave McNeely, *Sausage and Laws: Better Not Watch Them be Made*, HERALD ZEITUNG (Apr. 18, 2015), https://herald-zeitung.com/opinion/dave-mcneely-sausage-and-laws-better-not-watch-them-be-made/article_9380c428-e650-11e4-a558-abddfc0ee9e0.html.

[171] The following paragraph uses the term "carbon credits" as synonymous with "carbon offsets." While there are distinctions between these two terms, those are not pertinent to the discussion.

carbon sequestered by those forests. The GHG Protocol allows the use of carbon credits under certain conditions.[172] The cost of purchasing a carbon credit is typically far lower than the cost of reducing emissions within a company's own value chain. This has led many companies to rely on credits as a major component of meeting their climate targets. Unfortunately, experience over the last decade demonstrates that the institutional framework of the carbon credit market is quite weak. Many of the credits sold have not resulted in the promised carbon reductions, and several high-profile projects came under criticism for human rights violations.[173]

An important achievement of SBTi was to constrain the use of credits. For example, under the SBTi's Net-Zero Corporate standard, companies are generally barred from using credits to fulfill their science-based targets.[174] The decision to ban credits represented important progress, and a mark of legitimacy, for SBTi. Nevertheless, the debate over credits renewed in late 2023 when an organization known as the Voluntary Carbon Markets Initiative (VCMI) published its "Scope 3 Flexibility Claim (Beta version)" document.[175]

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[172] *See* THE GREENHOUSE GAS PROTOCOL, THE GHG PROTOCOL FOR PROJECT ACCOUNTING 5 [hereinafter GHG PROTOCOL PROJECT STANDARD]; *see also* GHG PROTOCOL CORPORATE STANDARD, *supra* note 124, at 58–63.

[173] *See* JOANA SETZER & CATHERINE HIGHAM, GLOBAL TRENDS IN CLIMATE CHANGE LITIGATION: 2023 SNAPSHOT 42 (2023); *see also COP28: Carbon Market Rules Should Protect Rights: Expert Group to Propose Rules for Future Market Under Paris Agreement*, HUM. RTS. WATCH (Mar. 7, 2023), https://www.hrw.org/news/2023/03/07/cop28-carbon-market-rules-should-protect-rights.

[174] *See* SBTi Net-Zero Standard, *supra* note 141, at 37. The criteria C28 makes permissible use of credits for so-called "residual emissions" in long-term targets (the last 10% of emissions). *See id.* at 14, 41. For present purposes, this exception is of little significance.

[175] *See* VOLUNTARY CARBON MARKETS INTEGRITY INITIATIVE, SCOPE 3 FLEXIBILITY CLAIM, BETA VERSION (2023) [hereinafter VCMI, FLEXIBILITY CLAIM]. For advocates' publicized concerns with the Flexibility Claim, *see Statement from the SBTi Board of Trustees on Use of Environmental Attribute Certificates, Including but Not Limited to Voluntary Carbon Markets, for Abatement Purposes Limited to Scope 3*, SBTI (Apr. 9, 2024), https://sciencebasedtargets.org/news/statement-from-the-sbti-board-of-trustees-on-use-of-environmental-attribute-certificates-including-but-not-limited-to-voluntary-carbon-markets-for-abatement-purposes-limited-to-scope-3. For the controversy around the flexibility claim, *See* Heather Clancy, *Read the Leaked Protest Letter from SBTi Staff Angry over New Carbon Offset Policy*, TRELLIS (Apr. 11, 2024), https://www.greenbiz.com/article/read-leaked-protest-letter-sbti-staff-angry-over-new-

1. The Scope 3 Flexibility Claim

Under the Scope 3 Flexibility Claim, VCMI sanctions the use of "high-quality carbon credits" to meet up to 50% of companies Scope 3 emissions between 2024 and 2030, and 25% between 2030 and 2035.[176] The intended goal of the Scope 3 Flexibility Claim was to help companies close a growing gap in their ability to meet existing Scope 3 targets.[177] By allowing the Flexibility Claim, VCMI hopes to harness companies' difficulties in meeting Scope 3 targets to drive investment into projects that can issue carbon credits. VCMI estimates the resulting demand for carbon credits would increase by "$19bn [billion] currently [2023] and $65bn in 2030."[178]

Several months after VCMI released its paper, the SBTi Board of Trustees announced its intent to provide greater flexibility for the use of credits under its own targets.[179] The announcement was followed by significant pushback from SBTi staff and advocacy groups.[180] To date, no changes have been made in actual SBTi standards, though the consultation process remains ongoing. For its part, CCRM has expressed significant concern over the Scope 3 Flexibility Claim.[181] Among other things, CCRM highlights that the Flexibility Claims would allow companies to count credits towards 50% of all their Scope 3 emissions, not merely the amount of Scope 3 emissions they are required to reduce under their targets. A majority (8 of 14) of the companies CCRM surveyed would actually be entitled to increase their Scope 3 emissions, and count the credits to offset the increase.[182] CCRM concluded its findings as follows: "…this proposed

carbon-offset-policy; *see also The SBTi Board's Statement on Carbon Credits Is Not Grounded in Science or Due Process*, NEWCLIMATE INST. (Apr. 11, 2024), https://newclimate.org/news/the-sbti-boards-statement-on-carbon-credits-is-not-grounded-in-science-or-due-process.

176 *See* VCMI, FLEXIBILITY CLAIM, *supra* note 175, at 9.

177 *See id.* at 3.

178 *See id.* at 14.

179 *See Statement from the SBTi Board of Trustees on Use of Environmental Attribute Certificates, Including but Not Limited to Voluntary Carbon Markets, for Abatement Purposes Limited to Scope 3*, *supra* note 175.

180 *See* Clancy, *supra* note 175; *see also The SBTi Board's Statement on Carbon Credits Is Not Grounded in Science or Due Process*, *supra* note 175.

181 *See* CCRM 2024, supra note 5, at 6.

182 *See id.*; *see also* VCMI, FLEXIBILITY CLAIM, *supra* note 175, at 12, fig.4 (top right panel).

flexibility mechanism would nullify the scope 3 commitments of most companies and leave them accountable only to their scope 1 and 2 targets."[183]

In previous discussions throughout this Article, my focus has been on showing that the key questions around corporate targets—how to allocate the global carbon budget, and how to create a system of GHG accounting—are policy issues that fall beyond the realm of science. To an extent, the debate around carbon credits is an exception to this theme. At the core of the carbon credit concept is the notion that a project leads to a quantifiable reduction in carbon emissions compared to a "baseline scenario" where that project did not exist.[184] When a carbon credit issuer claims a given reduction in emissions, aspects of that claim can be assessed scientifically in a way that some of the other issues discussed in this Article cannot be.[185] For example, if a carbon credit were to use an incorrect methodology to assess the amount of carbon sequestered by a newly planted forest, a scientific analysis would be able to identify the incorrect methodology and assess the amount sequestered more accurately.

Notice, however, that even here, there is a relatively quick transition from the strictly scientific questions, to the more institutional ones. There is today significant evidence regarding systematic "over-crediting," that is, over-estimations, of the amount of emissions reductions that are sold as credits.[186] Given this evidence, the key question is whether target rules should restrict the use of credits wholesale, instead of waiting for advocates to challenge projects on case-by-case basis (a task that requires considerable resources). Note that this second question is distinct from the first. Scientific evidence can tell us whether a given project or set of projects lead to over-crediting. What one chooses to do with that information requires weighing the relative policy benefits and risks of carbon credit markets to climate action.

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183 CCRM 2024, *supra* note 5, at 6.

184 *See* GHG PROTOCOL PROJECT STANDARD, *supra* note 171, at 14–15.

185 To be sure, policy concerns with carbon credits go beyond the risk of bad science in specific instances. For a summary of core concerns in the literature, *see* Welton, *supra* note 16, at 202–207.

186 *See, e.g.*, Barbara K. Haya et al., *Comprehensive Review of Carbon Quantification by Improved Forest Management Offset Protocols*, FRONTIERS IN FORESTS AND GLOB. CHANGE 1(Mar. 20, 2023), https://www.frontiersin.org/journals/forests-and-global-change/articles/10.3389/ffgc.2023.958879/full.

Does SBTi ban carbon credits from targets and forgo their benefits, or allow credits in targets and risk abuses? That is the decision that SBTi must make regarding VCMI's Scope 3 Flexibility Claim, not just a scientific determination.

VCMI aside, there are two additional contexts where carbon credit-like instruments play a significant role under SBTi targets.

2. Carbon Removals in SBTi's FLAG Guidance

The first context is SBTi's FLAG (Forest, Land, Agriculture) guidance.[187] The Article only touches briefly on this guidance due to the highly specialized and technical nature of land-based emissions in an already technical Article. Under the FLAG guidance, companies in land-intensive sectors may use biogenic removals (e.g., reforestation, or improvements in soil carbon sequestration on auricular land) to reduce their Scope 3 emissions.[188] Practitioners refer to this arrangement as "insetting," because the biogenic removals take place within the company's supply chain, for example, in land owned directly by the company. This is distinct from carbon credits that are purchased from vendors outside the company's supply chain (e.g., a reforestation project run by a different company).[189] Notwithstanding this difference, advocates, like the CCRM, raised the concern that insetting under the FLAG Guidance may suffer from the risk of overcrediting much like conventional carbon credits.[190] This concern is further exacerbated by the lack of a requirement for third-party certification that is common for carbon credits.[191]

187 *See* SBTi FLAG GUIDANCE, *supra* note 109; CARL, *supra* note 108, at 1.

188 *See* SBTi FLAG GUIDANCE, *supra* note 109, at 34.

189 *See* CCRM 2023, *supra* note 5, at 51, 62, 66.

190 *See id.* at 66 ("[T]he same environmental integrity issues apply as for any other carbon dioxide removal offsetting projects."). A new "Land Sector and Removals Guidance" by the GHG Protocol is meant to address some of these concerns. *See Land Sector and Removals Guidance*, GREENHOUSE GAS PROTOCOL, https://ghgprotocol.org/land-sector-and-removals-guidance (last visited Dec. 20, 2024).

191 *See* CCRM 2023, *supra* note 5, at 66. For recent calls to create separate targets for source reductions and removals, *see* CCRM 2024, *supra* note 5, at 49, 50.

3. Market-Based Accounting for Scope 2 Emissions

Another concept related to carbon credits is the use of market-based accounting for Scope 2 emissions. To refresh, Scope 2 emissions include those from the generation of power that a reporting company purchases from a supplier. The GHG Protocol allows for two distinct methods to calculate these Scope 2 emissions: the location-based method and the market-based method.[192] Under the location-based approach, companies take their electric consumption and multiply it by the average emission factor for electricity on their local power grid (an emission factor refers to kilograms or pounds of CO_2e (and per kWh generated).[193] In the U.S., emission factors for the location-based methods are typically sourced from EPA's eGRID database, which provides emission factors for subregions.[194] In contrast, under the market-based method, companies do not use the emission factor of their local grid, but instead use the emission factor of a specific power supplier with whom they have a contractual relationship. For example, a company can enter an agreement with a solar or wind farm, and then use the emission factors from those specific suppliers (note that those will be far lower than the overall grid). Renewable Energy Certificates (RECs) and Power Purchase Agreements (PPAs) are common contractual instruments used for this purpose.[195]

The use of RECs and PPAs under the location-based method is conceptually similar to carbon credits. The reason is that when companies consume power, that power is generally sourced from the local grid as a whole, not from the specific counterparty to the REC or PPA agreement (This assumes there is no private transmission line from the supplier to the company, which is rare). Therefore, the power

[192] *See* MARY SOTOS, GHG PROTOCOL SCOPE 2 GUIDANCE 8 (2015) [hereinafter GHG PROTOCOL, SCOPE 2 GUIDANCE], https://ghgprotocol.org/sites/default/files/2023-03/Scope%202%20Guidance.pdf.

[193] *See id.* at 10, 49.

[194] *See Emissions & Generation Resource Integrated Database (eGRID)*, EPA, https://www.epa.gov/egrid (last visited Dec. 21, 2024).

[195] As a matter of terminology, RECs could be referred to as "unbundled" or "bundled." In unbundled RECs, the company only purchases the right to use the power supplier's lower emission factor; in bundled RECs, the company also purchases certain financial rights to the electricity purchased. PPAs can be conceived as bundled RECs for long-term periods (e.g., 10 years). They are often, but not always, used for new installations. *See* CCRM 2023, *supra* note 5, at 41–42.

consumed may be said to be outside the company's "value chain," which is a defining feature of a carbon credit.[196]

Under present SBTi rules, companies are allowed to use market-based accounting in satisfaction of their Scope 2 targets.[197] Advocates have expressed concerns about market-based accounting. For example, CCRM expressed the following concerns with respect to RECs:

> The procurement of [RECs] is very unlikely to contribute to additional renewable electricity supply capacity. While the purchase of RECs could send a signal to investors that there is demand for renewable energy in theory, there are indications that this is often not the case in practice due to issues including oversupply of certificates and associated low prices, and implicit double counting.[198]

These concerns can be expressed in the language of "additionality," which is one of the traditional GHG Protocol considerations for the legitimate use of carbon credits.[199] Conserving a forest that was not about to be cut does not provide "additionality" in emissions reductions over the existing baseline (where the existing forest would continue to sequester carbon even in the absence of the project). Analogously, selling RECs from an existing project—or a project that would likely have been built regardless of the REC[200]—also does not provide "additionality" in renewable energy capacity to the grid. If

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196 That is the case regardless of whether the instrument used is a bundled REC, an unbundled REC, or a PPA. *See id*.

197 *See, e.g.*, SBTi, NEAR-TERM TARGETS, *supra* note 65, at 10 (C8); SBTi announced its intention to further study Scope 2 in 2022, but to date, did not seem to change its guidance treatment. *See* Andres Chang, *The Evolution of Scope 2 Accounting, Target Setting and Monitoring*, SBTi (May 9, 2022), https://sciencebasedtargets.org/blog/the-evolution-of-scope-2-accounting-target-setting-and-monitoring.

198 CCRM 2023, *supra* note 5, at 41. As far as PPAs, while CCRM considers those to have certain advantages relative to RECs, it still expresses concern: "The causal link between a PPA and additional [renewable] capacity is often very hard to prove." *Id*. at 41–42.

199 *See* GHG PROTOCOL, SCOPE 2 GUIDANCE, *supra* note 192, at 90; *but see infra* note 201 regarding additionality not being a requirement *per se* for credit recognition.

200 For example, because the project was already made financially feasible thanks to tax credits in the 2022 Inflation Reduction Act, *see generally* Inflation Reduction Act of 2022, Pub. L. No. 117-169, 136 Stat. 1818 (2022) (codified as amended mostly in scattered sections of 26 U.S.C.A.).

we follow this logic, purchasing an REC that does not provide additionality should be banned. Note, however, that under the GHG Protocol, companies using the market-based approach do not have to demonstrate additionality of their contractual instruments.[201] SBTi relies on the GHG Protocol approach, so the REC without additionality can also be used in satisfaction of Scope 2 targets.

This raises the now familiar question: is the market-based approach consistent with climate science? One valid answer is "no," because that approach ignores additionality, which is, after all, relevant to the global carbon budget. However, looked at from a different perspective, the answer may be more complex. One key observation is that GHG accounting requires additionality in the context of carbon credits, but uses a completely different logic in the context of regular reductions within a company's value chain. Consider the following example. A company purchases an air-travel ticket and books a 1tCO2 increase to its GHG inventory. The 1 tCO2 does not necessarily correspond to an increase in 1 tCO2 in emissions to the atmosphere as a result of the company's purchase. It is very likely, for example, that the flight and resulting emissions would have taken place even if the company had not purchased the ticket. Similarly, if the company now cancels the ticket, the emissions in its GHG inventory would decline by 1tCO2, but assuming the plane still takes off, emissions in the atmosphere will remain unchanged.

I am highlighting this point to emphasize that when we account for carbon, we often measure something that is distinct from physical emissions. We are measuring *responsibility* for physical emissions. What we are saying is not necessarily that the company's action led to an increase of 1 tCO2 in the atmosphere, but that 1tCO2 reflects a company's share of responsibility for emissions incurred during a flight. We use a precise quantitative measure (1 tCO_2) to attribute responsibility, but we should not conflate this measure with atmospheric changes of the same amount. The air-travel example is not

[201] *See* GHG PROTOCOL, SCOPE 2 GUIDANCE, *supra* note 192, at 90. It is worth noting that even outside of the context of market-based accounting, the GHG Protocol "…does require a demonstration of additionality *per se*…", but rather incorporates it "…as an implicit part of the procedures used to estimate baseline emissions." *See* GHG PROTOCOL PROJECT STANDARD, *supra* note 65, at 8. The complexities of additionality within the Project Standard are beyond the scope of this Article.

exceptional.[202] A company increasing its production could lead to a decline in the market share of another company. Thus, increased emissions from Company A can be balanced by decreased emissions from Company B. When accounting for these changes, we are not asking whether Company A caused an increase in atmospheric carbon relative to a counterfactual where it did not increase its market share. We are saying that Company A is becoming responsible for given emissions, without examining causality. Of course, from a policy point of view, the whole goal of reducing accounted emissions is our hope for a reduction in actual physical emissions. The key point to understand is that this link is very imprecise. It is a policy assumption we make about the overall effects of the accounting system. It is not a test that we require for individual accounting entries.

So, to return to our original question, whether the market-based approach is consistent with climate science, if our focus is on additionality and physical emissions, the answer is probably not. But if our focus is on the broader system of carbon accounting, the logic that the system as a whole is based on is not one that emphasizes the "but for" causation of the scientific approach. From this point of view, the fact that the GHG Accounting Protocol insists on additionality for carbon credits and not for market-based accounting has less to do with scientific notions of the global carbon budget, and more to do with policy heuristics. That is, the Protocol's choices indicate a heuristic that carbon credits are just so much more vulnerable to abuse than general carbon accounting that they require special guardrails like additionality.[203] These same choices also indicate a heuristic that instruments like RECs have a lower risk of abuse, so they should be treated like general accounting practice rather than like credits.

As a standard-setting body for corporate climate targets, SBTi has always faced the choice of whether to adopt the Protocol's

[202] For example, a company increasing production could cut into the market share of another company. Thus, increased emissions from Company A can be offset by decreased emissions from Company B.

[203] For a critique of the additionality requirement for credits, *see* James Salzman & David Weisbach, *The Additionality Double Standard*, 48 HARV. ENV'T. L. REV. 117 (2024). The contrast Salzman and Weisbach draw is between credits and other social subsidy systems. The contrast in focus here is between credits and other areas of the GHG Protocol.

relevant rule (as SBTi often does), or whether to create its own rule to override it (as it does occasionally). In the context of market-based accounting, SBTi chose the former option, essentially endorsing the policy heuristics underlying the Protocol's approach. From the perspective reflected in this Article, the discussion we should be having about SBTi's choice is more about whether the policy heuristics are good ones, and less about whether the rule is consistent with science.

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It is time to summarize our discussion of carbon accounting. Carbon accounting is a system of rules that assigns responsibility for physical emissions to specific companies. This Part emphasized two themes. First, that accounting definitions (broad or narrow) and classifications (Scopes 1, 2, 3) shape the overall level of reductions required under targets. In this sense, they are analogous to the allocation rules discussed in Part II of the Article, though their allocative function is less transparent. Second, this Part demonstrated that the most consequential decisions faced by SBTi and the GHG Protocol—operating boundary definitions, the expansive rule, the Scope 3 Flexibility Claim etc.—are more matters of policy than of scientific reasoning. The concern is not so much with the discretion that is inherent in carbon accounting, but in the elevation of a specific set of policy judgements to a special scientific imprimatur.[204]

In Part IV, we move from these insights about the role and limitation of science in SBTi targets to assessing the various climate-washing concerns they involve.

IV. CLIMATE-WASHING IN TARGETS

"Climate-washing" refers to incorrect or exaggerated claims regarding climate benefits advertised by corporations and other organizations, for example, universities.[205] The economic drivers

[204] This is not to say that SBTi and the GHG Accounting Protocol are meritless. Having rules and definitions that corporations need to follow can provide a measure of standardization and, if rules are appropriately enforced, prevent certain abuses.

[205] For a fuller definition, *see* AKRITI BHARGAVA ET AL., CSSN RESEARCH REPORT 2021:1: CLIMATE-WASHING LITIGATION: LEGAL LIABILITY FOR MISLEADING CLIMATE COMMUNICATIONS 4–5 (Jan. 2022) [hereinafter CSSN

behind climate-washing are substantial. In many parts of the world, corporations are coming under increased pressure to decarbonize their activities and offer sustainable products. This poses a dilemma. Actual decarbonization is complex. It requires changes in established business models and real operations. Meanwhile, creating the appearance of decarbonization can be quick and cheap to achieve. It is the stuff of marketing and communications. What we see in practice is many corporations taking the latter course.

The social costs of climate-washing are considerable. From an advocacy point of view, climate-washing dampens stakeholder pressure on organizations. By creating the appearance of ambitious action, organizations placate stakeholders who believe their organization is already doing the right thing. From an economic point of view, climate-washing undermines competitive pressures that can drive climate action. Absent climate-washing, stakeholder demands could lead to a virtuous "race to the top" where organizations try to differentiate themselves by leading the climate transition. With climate-washing, climate alignment rhetoric becomes so ubiquitous that organizations face difficulties distinguishing themselves based on authentic climate action.[206] If everybody is a climate leader, no one is. Interestingly, the same seems to hold true in reverse. When truly responsible climate action is incorrectly labeled as climate-washing, that erodes incentives to engage in such action. For this reason, it is important to use the term climate-washing precisely, as both false negatives (climate-washing that goes undetected) and false positives (authentic action labeled as climate-washing) have costs.

This Part of the Article addresses climate-washing concerns in the specific context of corporate climate targets, and with a focus on the SBTi standard. The setting of an SBTi target is a powerful way in which organizations can signal a commitment to limit global warming to 1.5C.[207] Meanwhile, the technical nature of climate

2022], https://cssn.org/wp-content/uploads/2022/01/CSSN-Research-Report-2022-1-Climate-Washing-Litigation-Legal-Liability-for-Misleading-Climate-Communications.pdf.

206 *See, e.g.*, CCRM 2022, *supra* note 5, at 10 ("The difficulty of distinguishing real climate leadership from greenwashing is a key challenge that, where addressed, has the potential to unlock more substantial global climate change mitigation ambition.").

207 *See* CCRM 2023, *supra* note 5, at 13.

targets and accounting makes it difficult for stakeholders to assess the true level of ambition of an organization's SBTi target.[208] This means that organizations can often reap reputational benefits on the cheap, while only committing to limited action. My concern in this Part is with the gap between what is actually being promised and the appearance of what is being promised.[209]

A. *A Typology of Climate-washing Concerns*

Recall that the backdrop to SBTi's rise was the widespread climate-washing that accompanied the first generation of corporate climate targets.[210] SBTi emerged as the standard-setting body that could provide transparency and integrity to climate targets. Whether or not SBTi fulfills its intended role is a matter of controversy. The *Corporate Climate Responsibility Monitor* (CCRM) is a detailed research report published by the NewClimate Institute and Carbon Market Watch, both nonprofits.[211] The CCRM analyzes the climate targets of about two dozen global companies. Many of these companies have SBTi targets.[212] Overall, the image of SBTi that appears from the CCRM is complex. While SBTi plays a necessary and somewhat positive role in standard-setting, it shares responsibility for widespread climate-washing in targets. One of the central

208 *See id.* at 35.

209 It is worth noting that there can be other types of climate-washing around targets that fall beyond the scope of this Article. For example, in a recent complaint, plaintiffs alleged meat-producer JBS committed to an SBTi target that the company has no real plan to achieve. *See* Complaint at 34, People v. JBS USA Food Co., 2024 WL 992842(N.Y. Sup. Ct. Feb. 28, 2024); *see also* Andrea Shipton, Climate Washing Litigation Note 16–21 (Aug. 30, 2024) (unpublished manuscript), https://o365coloradoedu-my.sharepoint.com/:w:/g/personal/naor2878_colorado_edu/EfdTOeaHItlHvY5-pSlQT5gBxtX_ci8PTPoL49fjdPySRg?e=wSIVmK. In contrast, our focus here is not on companies' transition planning (or lack thereof), but on ensuring an accurate representation of the meaning and significance of the target.

210 *See* discussion *supra* Part II.B.

211 *See* CCRM 2022, *supra* note 5; CCRM 2023, *supra* note 5; CCRM 2024, *supra* note 5. For background regarding the NewClimate Institute, *see Who We Are*, NEWCLIMATE INST., https://newclimate.org/about-us (last visited Dec. 22, 2024).

212 *See, e.g.*, CCRM 2023, *supra* note 5, at 6 (noting that SBTi has certified the 2030 targets including 16 out of the 24 companies surveyed in the report).

themes of the 2023 CCRM is the way in which SBTi lends legitimacy to otherwise inadequate targets:

> SBTi certifications for short- and medium-term targets lend credibility to companies whose targets are highly insufficient. . . . Most of these companies highlight their SBTi certifications prominently in their climate-related communications to defend targets that are highly insufficient in the context of latest available science, and sometimes misleading. The SBTi's verifications of 2030 targets often neglect relevant details leading to the undifferentiated certification of corporate targets, regardless of whether a company is lagging in climate action or can truly be considered a climate leader.[213]

When discussing climate-washing in targets, it is important to recall the takeaway from Parts II and III of the Article. The alignment approach is science-based in that it is anchored in the global carbon budget, but it inherently involves discretion exercised by standard-setting bodies in allocating that budget and defining accounting rules. How this discretion is exercised can make a large difference in the level of emissions reduction required by companies. This understanding has important implications for climate-washing.

On the one hand, it makes SBTi's emphasis on the science behind its targets less convincing than it initially appears. When consumers hear of "science-based" targets, they may reasonably assume the "science" is more or less determinative of how targets are set. But if targets requiring wildly different levels of reductions can be set while still being "science-based," the role of science in parsing out credible targets from uncredible ones is somewhat limited. That raises a climate-washing concern: that targets many would find under-ambitious are being made credible through an appeal to science which is largely inapposite. On the other hand, the realization that science often does not provide unique answers for corporate climate targets can also complicate the case for raising a climate-washing concern. If science did provide unique answers to the relevant questions around corporate targets, one would be able to critique such targets as simply inconsistent with science. Unfortunately, that is often not possible. The limited role science plays in answering key questions around targets runs the risk that climate-washing would tun into an exercise in relativist thinking, something

[213] CCRM 2023, *supra* note 5, at 34. *See also* CCRM 2024, *supra* note 5, at 7.

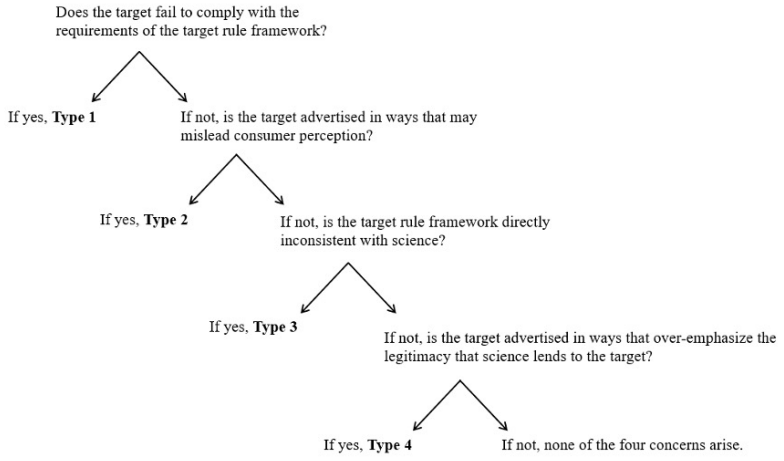
that is in the eye of the beholder (what is "ambitious climate action" to some is "climate-washing" to others). That result too would be highly problematic. Advocates need a language that can help distinguish legitimate targets from illegitimate ones.

What is necessary is a practical middle path that avoids exaggerated claims about the role of science in targets, but also avoids the pitfalls of relativism. The key to achieving this goal is in diversifying the kind of criteria we use to identify climate-washing. In this spirit, we can think of a typology of four distinct climate-washing concerns surrounding SBTi targets:

- Type 1—Instances where a given corporate target fails to comply with the rules of the target framework (e.g., SBTi criteria);
- Type 2—Instances where a target complies with SBTi criteria, but has advertised in ways that mislead consumer perception;
- Type 3—Instances where target rules are directly inconsistent with climate science;
- Type 4—Instances where SBTi or a company over-emphasizes the legitimacy climate science lends to a target.

Figure 6 organizes the four types in a tree diagram to show their inter-relationships.

Figure 6: A Typology of Climate-washing Concerns in Targets



This typology can be used in a number of contexts. Civil society organizations like the NewClimate Institute can use the typology to inform their monitoring work of corporate targets, as well as their broader policy engagement with standard-setting bodies like SBTi and the GHG Protocol.[214] The typology can also inform different roles that regulators and legislators can play in the target setting process. Most specifically, however, the typology is made with an eye towards the emerging field of climate-washing litigation.[215] Each type of climate-washing concern is a potential strategy to establish liability for problematic targets.

B. *Theories of Liability*

In the U.S., there are several legal theories that can be used to establish climate-washing liability. Those include common law fraud, unfair and deceptive acts and practices, as well as securities regulation theories. While the discussion of doctrinal aspects remains at a high-level, a few words are in place about each.[216] Common law fraud is a traditional doctrine, including the following elements:

> (1) a false statement of facts; (2) known or believed to be false by the person making it (i.e., scienter); (3) an intent to induce the plaintiff to act; (4) action by the plaintiff in justifiable reliance on the truth of the statement, and (5) damages to the plaintiff resulting from such reliance.[217]

Several of these elements, including falsity, scienter, and damages (1, 2, and 5) can make the theory challenging for plaintiffs to prove.

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[214] *See infra* Part IV.C, especially (1) and (4).

[215] About 25 climate-washing claims have been filed worldwide in both 2021 and 2022 (up from under 10 claims in both 2019 and 2020). Only a subset of these claims are specific to climate targets, as distinct from other forms of climate-washing. About two dozen cases have been filed in the U.S. from 2017 to 2022. *See* SETZER & HIGHAM, *supra* note 173, at 40–41. For information about the rise of climate-washing litigation, *see* also CSSN (2011), *supra* note 205; Shipton, *supra* note 209.

[216] For an analysis of how these theories are used by plaintiffs in the context of recent complaints, *see* Shipton, *supra* note 209.

[217] *See* LOUIS R. FRUMER & MELVIN I. FRIEDMAN, PRODUCTS LIABILITY § 55.02 (2024).

In contrast, unfair and deceptive acts and practices (UDAP) is part of modern consumer protection law, and offers greater flexibility to plaintiffs. UDAP are declared unlawful by Section 5 of the Federal Trade Commission (FTC) Act, which also provides the Federal Trade Commission (FTC) with enforcement and rulemaking authority.[218] States have their own UDAP statutes ("UDAP laws") and those often provide private enforcement that the federal statute lacks.[219] When compared to common law fraud, UDAP laws provide plaintiffs with a more favorable theory under which to pursue liability for climate-washing. First, the definition of UDAP is somewhat broader than common law fraud. It involves all acts and omissions that would be materially misleading when considered from the point of view of a "reasonable consumer."[220] As discussed below, a statement can be misleading even if it is not false (the first element of fraud). Second, intent to deceive (the second element of fraud) is not typically a required element of UDAP. Third, UDAP laws often provide for statutory damages for prevailing consumer plaintiffs.[221] Statutory damages are especially significant in states where they can be used by plaintiffs in combination with class actions under UDAP laws.[222]

[218] To date, it appears that no enforcement actions have been initiated by the FTC regarding climate-washing in targets. *See Cases Tagged with Environmental Marketing*, FTC, https://www.ftc.gov/enforcement/cases-proceedings/terms/1408?page=0 (last visited Apr. 27, 2025).

[219] *See* Dee Pridgen, *Wrecking Ball Disguised as Law Reform: ALEC's Model Act on Private Enforcement of Consumer Protection Statutes*, 39 NYU REV. OF L. & SOC. CHANGE 279 (2015).

[220] For example, at the federal level, "unfair practices" are as those "…[causing] or likely to cause substantial injury to consumers which is not reasonably avoidable by consumers themselves and not outweighed by countervailing benefits to consumers or to competition." 15 U.S.C. § 45(n). Deceptive practices are defined in the FTC Policy Statement on Deception. *See* Cliffdale Assocs., Inc., 103 F.T.C. 110, 174 (1984).

[221] *See* Pridgen, *supra* note 219, at 289.

[222] For a nuanced discussion on the availability of class actions in UDAP cases, *see id.* at 290–91, 298–99. For a related survey of the law across states, *see* NATIONAL CONSUMER LAW CENTER (NCLC), CONSUMER PROTECTION IN THE STATES: A 50-STATE EVALUATION OF UNFAIR AND DECEPTIVE PRACTICES LAWS 11–14, 36–37 (Mar. 2018), https://www.nclc.org/wp-content/uploads/2022/09/UDAP_rpt.pdf.

Of special relevance are the FTC's "Green Guides," which are specific enforcement guidelines for unfair and deceptive environmental marketing claims.[223] The FTC also issues Endorsement and Testimonials Guides (the "Endorsement Guides") that cover endorsers (like SBTi) and companies' uses of endorsements in their advertising.[224] While the Green Guides directly apply to federal enforcement by the FTC, the Green Guides can also be used indirectly by private plaintiffs under state UDAP laws.[225] For example, about half of states follow a rule that incorporates FTC's interpretation of Section 5 of the FTC Act as a "…persuasive source of authority for construing state consumer protection law."[226] A long-anticipated update of the Green Guides was initiated, but not completed, by the Biden Administration.[227] As of this writing, the future of the Green Guides under the second Trump Administration is uncertain. While, to my knowledge, no specific action has been taken to revoke the guidelines, this administration's broader efforts to undermine consumer protection, climate action, and continuity in federal career service could make them vulnerable in the future.[228]

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223 *See* Guides For The Use Of Environmental Marketing Claims, 16 C.F.R. § 260 (2025) [hereinafter FTC Green Guides]. As their name suggests, the Green Guides are administrative enforcement guidelines as distinct from binding regulations.

224 *See* FTC Enforcement Guide, 88 Fed. Reg. 48029, 48102 (July 26, 2023) [hereinafter FTC ENDORSEMENT GUIDES].

225 *See* CONNOR J. FRASER, WHAT'S IN A LABEL? THE FTC'S 'GREEN GUIDES' IN CONTEXT 4–5 (FEB. 23, 2023), https://stateimpactcenter.org/files/Whats-in-a-Label-The-FTC-Green-Guides-Issue-Brief.pdf.

226 *See id.* at 4–5.

227 *See FTC Seeks Public Comment on Potential Updates to its 'Green Guides' for the Use of Environmental Marketing Claims*, FTC (Dec. 14, 2022), https://www.ftc.gov/news-events/news/press-releases/2022/12/ftc-seeks-public-comment-potential-updates-its-green-guides-use-environmental-marketing-claims.

228 *See*, e.g., Trump Administration Orders Consumer Protection Agency to Stop Work, Closes Building, AP NEWS (Feb 9, 2025), https://apnews.com/article/trump-consumer-protection-cease-1b93c60a773b6b5ee629e769ae6850e9; Exec. Order No. 14162, Putting America First in International Environmental Agreements, 90 F.R. 8455 (2025); *The Dangers of Trump's Schedule Policy/Career Executive Order*, PROJECT ON GOV'T OVERSIGHT (Jan. 31, 2025), https://www.pogo.org/analysis/the-dangers-of-trumps-schedule-policy-career-executive-order.

Lastly, when dealing with publicly traded companies, securities regulation theories, like securities fraud (Securities Exchange Commission Rule 10b-5) can be used.[229] Like common law fraud, securities fraud requires scienter and may therefore be challenging to prove.[230] Under the Biden Administration, the SEC's Climate Disclosure Rule[231] could have provided another potential avenue for plaintiffs to explore liability. However, under the Second Trump Administration, the SEC has announced its intention not to defend against legal challenges that have been filed against the rule.[232]

Overall, UDAP is likely to be the most flexible theory for potential plaintiffs, and is therefore at the center of the discussion that follows. With this in mind, we turn to discussing the four types of climate-washing concerns in action.

C. *Applying the Typology*

1. Type 1: Non-Compliance with Target Rules

A Type 1 concern occurs when an organization's target does not comply with the target framework under which the target is issued. For present purposes, that target framework is the SBTi criteria and standards, though other target frameworks exist as well.[233] The target framework is a set of detailed rules that a company's target must comply with in order for SBTi to validate it as "science-based." For example, SBTi near-term targets must meet 28 distinct criteria, numbered C1 through C28.[234] These criteria govern issues ranging from the scope of emissions that need to be covered, the

229 *See* 17 C.F.R. § 240.10b-5 (2012).

230 *See* Ernst & Ernst v. Hochfelder, 425 U.S. 185 (1976). While the question of whether recklessness would satisfy the scienter requirement was reserved in *Ernst v. Ernst*, circuit courts have consistently answered it in the affirmative. See STEPHEN CHOI & A.C. PRITCHARD, SECURITIES REGULATION: CASES AND MATERIALS 304 (5th ed., 2019).

231 *See* 17 C.F.R. § 210, 229, 230, 232, 239, and 249 (2024) [hereinafter, SEC CLIMATE DISCLOSURE RULE].

232 *See* Uyeda, *supra* 123.

233 *See, e.g.*, *Net-zero Guidelines*, INT'L ORG. FOR STANDARDIZATION, https://www.iso.org/netzero (last visited Apr. 26, 2025); *see also*, *Net-Zero Banking Alliance*, U.N. ENV'T PROGRAMME | FIN. INITIATIVE, https://www.unepfi.org/net-zero-banking/ (last visited Apr. 27, 2025).

234 *See* SBTI NEAR-TERM TARGETS, *supra* note 65, at 7–17.

types of permissible targets (absolute, intensity etc.), the rate of reduction under the target, selection of the base and target year, and so on. It is possible that there are instances where SBTi validates, and a company advertises, a target as "science-based" despite the fact that the target does not comply with some of the rules. These situations would raise a normative concern of misrepresenting the nature of the target to consumers.

In the first instance, that compliance assessment is carried out by SBTi itself. When companies set SBTi targets, they are required to submit those targets for SBTi "validation" within 24 months of announcing their commitment (the terms validation, certification, and approval are often used interchangeably in the SBTi literature).[235] The validation process is carried out by professional SBTi staff and involves non-trivial service fees for companies.[236] Whether or not the validation process achieves its goal in practice has been a matter of some debate. Climate advocates have expressed concerns that SBTi's validation is under-resourced and suffers from potential conflicts of interest. The CCRM 2022 is worth quoting at length on this point:

> Standard-setting initiatives face a difficult task to assess companies against their criteria and guidelines. Our extensive inspection of companies' targets often reveals specific details or loopholes that call those companies' apparent ambition into question . . . For the majority of the 18 companies assessed in this report with an SBTi approved 1.5°C or 2°C aligned target, we would consider such ratings as either highly contentious or inaccurate, due to subtleties that are difficult to detect … [going on to list examples of specific company targets analyzed in the CCRM]
>
> These examples illustrate the difficulty of performing individual assessments with limited resources, and raise the question whether it is realistic and valuable to conduct evaluations for a

235 *See* SBTI, SCIENCE BASED TARGETS INITIATIVE COMMITMENT COMPLIANCE POLICY (2022), https://sciencebasedtargets.org/resources/files/Commitment-Compliance-Policy.pdf.

236 *See How We Are Funded*, SBTI, https://sciencebasedtargets.org/about-us/funders (last visited Apr. 27, 2025) (noting validation service fees in 2024 of over $6 million, amounting to 36% of SBTi's income for that year). Historically, validation services were carried by SBTi itself, but they were recently shifted to SBTi Services Limited, a wholly owned subsidiary. *See* further discussion in text adjacent to note 241 *infra*.

> mass of companies without sufficient resources to conduct detailed investigations.[237]

CCRM 2022 then goes on to discuss concerns with a conflict of interest between SBTi's role in developing target rules, and its role in determining compliance with these rules:[238]

> Now that climate action is seen as an important component of companies' marketing strategies, companies have the intrinsic motivation to present themselves as frontrunners and their claims therefore need to be checked by independent entities. Due to their own intrinsic motivation to demonstrate mobilization and momentum, standard-setting initiatives are not entirely independent in this regard. There must be a division of power between organizations performing the functions of mobilization, standard setting, and verification, just as there should be a separation between legislative and judicative functions in any governance system. Standard-setting initiatives should focus on the development of guidelines and standards, rather than pursuing the mass evaluation of individual companies with insufficient resources and conflicting incentives. This can otherwise lead to a platform for greenwashing; multiple examples are included in this report.[239]

Other commentators have also highlighted the financial conflict of interest the SBTi organization faces given its collection of significant fees for target validation, and its reliance on corporate donations.[240] In an attempt to alleviate these concerns, SBTi has

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[237] CCRM 2022, *supra* note 5, at 26–27.

[238] Note that the quote refers to "standard-setting bodies" in general, but that category includes SBTi as an important actor.

[239] CCRM 2022, *supra* note 5, at 27. The 2024 CCRM calls for a transition from voluntary climate targets to binding regulations to address these concerns. *See also* CCRM 2024, *supra* note 5, at 62, 63.

[240] *See* Camilla Hodgson, *Climate Targets Oversight Group Under Scrutiny Over Its Own Governance: Science Based Targets Initiative Makes Changes After Complaint About Transparency and Potential for Conflict of Interest*, FIN. TIMES (Feb. 2, 2022), https://www.ft.com/content/75527cce-9748-4aec-b6e6-7c7828460d2a. *See also How we are Funded*, SBTI, https://sciencebasedtargets.org/about-us/funders (last visited Apr. 27, 2025) (as of 2024, about 61% of total funding is from donations ("core funding"), by Bezos Earth Fund and IKEA foundation, and 36% of funding is from service fees, including for target validation). Specific projects, like the FLAG Guidance also received funding from relevant companies during their development. *See* SBTI FLAG GUIDANCE, *supra* note 109, at 3.

recently shifted its validation services activities to "SBTi Services Limited" ("SBTi Services"), a wholly owned subsidiary of SBTi.[241] It remains to be seen whether the reform can in fact boost the credibility of the validation process in the eyes of advocates.

In doctrinal terms, plaintiffs wishing to litigate Type 1 concerns may use a UDAP theory. Plaintiffs will argue that when an entity (a company or SBTi itself) represents that a target has been validated by SBTi, reasonable consumers will understand this to mean the target complies with SBTi's rules. This argument will be underscored by the FTC's *Endorsement Guides* requiring that bodies like SBTi utilize "… standards previously adopted by the organization…" in evaluating products.[242] According to those guides, liability for "unsubstantiated statement[s] made through endorsement" can be established directly against the endorser (here, SBTi).[243] Furthermore, liability for unsubstantiated claims can be established against advertisers even if an expert organization provides the certification.[244] In other words, companies touting SBTi's validation are unlikely to raise a successful defense based on the notion that it was SBTi's responsibility to substantiate the claims.

Be that as it may, when discussing the first type of climate-washing concerns, the focus is largely descriptive: "Was the target set in a way that is compliant with the target framework?" The key benefit of this approach is that compliance allows for relatively objective, and hence uncontroversial, assessments. To make a successful Type 1 claim would require careful assessment of the target's purported non-compliance. The most powerful claim is one that references specific SBTi criteria and offers evidence indicating that

241 *See* SBTI SERVICES, https://www.sbtiservices.com/ (last visited Apr. 27, 2025); Tommy Wilkes & Ross Kerber, *Group Judging Corporate Climate Claims Overhauls Itself After Criticism*, REUTERS (Sept. 13, 2023), https://www.reuters.com/sustainability/boards-policy-regulation/group-validating-global-corporate-net-zero-claims-be-overhauled-2023-09-13/. *See also Corporate Climate Action Gets a Boost With Upgrade to Target Validation and Standard Setting, SBTI* (Sept. 13, 2023), https://sciencebasedtargets.org/news/corporate-climate-action-gets-a-boost-with-upgrade-to-target-validation-and-standard-setting.

242 *See* FTC ENDORSEMENT GUIDES, *supra* note 224, §§ 255.3–4.

243 *Id*. § 255.1.

244 *See* FTC Green Guides, *supra* note 223, § 260.6(c) ("[t]hird-party certification does not eliminate a marketer's obligation to ensure that it has substantiation for all claims reasonably communicated by the certification.").

these criteria were not met. In principle, the high level of detail in the SBTi framework should facilitate climate advocates' ability to perform such a compliance assessment.[245] In practice, advocates face significant challenges.

One challenge is the complexity of the SBTi framework. To perform meaningful compliance assessment, one must have a clear picture of the rules applying to the target. SBTi has distinct rules for near-term and long-term targets, as well as for targets issued for each sector using the sectoral approach. Targets can be made with 1.5C or WB2C ambition involving different rules. Recently, SBTi also issued a separate Corporate Net-Zero Standard. This is yet another set of rules that incorporates near- and long-term targets and advertises 1.5C ambition.[246] Further complicating the picture is the fact that SBTi updates its rules relatively frequently. A target that seems inconsistent with current rules may nevertheless be formally in compliance if it met the applicable rules during the time it was issued. Navigating this complex rule system requires considerable time and expertise.

A second challenge is informational. The work of monitoring reports like CCRM requires access to detailed information regarding a company's target and GHG inventory. The best source of information would be for SBTi Services to make publicly available the actual documentation that companies submit as part of the target validation process (as well as any documentation produced by SBTi Services itself).[247] So far, it appears that this documentation has been treated as proprietary information rather than as a public resource. In the absence of direct documentation, monitoring efforts have to rely on sources like companies' corporate climate

[245] In this respect, it is worth noting that some other (non-SBTi) frameworks for climate targets are looser (including terms that are often vague and open to interpretation) than the SBTi criteria. In those cases, it would be relatively more difficult for plaintiffs to pursue liability under Type 1 claims.

[246] *See* SBTi Net-Zero Standard, *supra* note 141.

[247] *See Target Validation* Services, SBTI SERVICES, https://www.sbtiservices.com/services/corporates_fi (last visisted Apr. 27, 2025) (select "submit" under subheading "The Target Setting Process") (noting that companies ". . .must complete and upload the relevant target submission forms" as well as their "target setting tools" through the Validation Portal).

disclosures and responses to CDP surveys.[248] While those are useful second-bests, they may leave out important information or may be inconsistent with documentation submitted to SBTi that advocates currently lack access to. To promote transparency, it would therefore be useful if SBTi (and SBTi Services) disclosed all validation documents. For their part, regulators and legislators should consider making such disclosures mandatory for companies with validated SBTi targets.[249] This policy will also avoid the need to file claims to obtain the documentation in discovery.

The following paragraphs demonstrate some of the issues involving a Type 1 claim through a concrete example. One of the issues flagged in the 2022 CCRM is concern about companies diluting the ambition of their targets through the choice of a base year with unusually high emissions. Consider CVS health, which selected the year 2019 as the base year for its target to reduce certain Scope 3 emissions 47%-by-2030 (Scope 3 accounts for about 90% of the company's total 2019 emissions).[250] When examining CVS's Scope 3 emissions, CCRM discovered that 2019 had Scope 3 emissions that were 70–80% higher than those in either 2018 or 2020.[251]

[248] For company responses to CDP climate surveys, see *CDP Data Licenses*, CDP, https://www.cdp.net/en/data-licenses#corporate-response-datasets (last visited May 23, 2025) (containing information under "Climate Change Corporate Response Dataset" which requires a free subscription).

[249] As noted above, in the U.S., the SEC CLIMATE DISCLOSURE RULE is soon expected to be struck down. *See* 17 C.F.R. § 210, 229, 230, 232, 239, and 249 (2024); text adjacent to *supra* note 231). However, even in the counterfactual where the rule is implemented, it would likely not require the type of disclosures recommended here. Specifically, while registrants were required to report certain information about their climate targets (where those targets were deemed material), to the best of the author's knowledge, the registrants were not specifically required to share documentation submitted as part of the target validation process. *See* 17 C.F.R. § 210, 229, 230, 232, 239, and 249 II(G)(1) (2024).

[250] *See* CCRM 2022, *supra* note 5, at 63.

[251] *See id.* at 20. The Scope 3 category subject to the target was purchased goods & services ("PG&S"). *Id.* at 63. CCRM's analysis seems to be based on figures from the 2020 Corporate Social Responsibility Report Appendix. In this report, CVS reports S3 PG&S emissions for 2018, 2019, and 2020 were about 11, 20.3, and 9.4 MtCO2 respectively. CVS HEALTH, 2020 CORPORATE SOCIAL RESPONSIBILITY REPORT APPENDIX 34 (2020), https://www.cvshealth.com/content/dam/enterprise/cvs-enterprise/pdfs/2020/2020-csr-report-appendix.pdf. Using these figures, the 2019 figure exceeded the 2018 and 2020 figures by 85% and 116% respectively.

By selecting 2019 as the baseline year for its target, CVS can meet its 47% reduction without actually cutting its emissions relative to 2018 or 2020. CVS's long-term (2050) target also uses the 2019 as the base year, leading to similar concerns. Both targets have been validated by SBTi under the "road test" version of its Net-zero standard.[252] CCRM reported related concerns with targets by Accenture, and GlaxoSmithKline, companies whose targets have also been validated SBTi targets.[253]

The CVS example clearly raises a climate-washing concern: under SBTi's imprimatur, a major company advertises a target which seems to fundamentally overstate its climate contribution. However, making a Type 1 claim requires an additional step, which is identifying a specific rule that has been violated in SBTi's framework. If such a rule cannot be identified, the company may have exploited a loophole in SBTi's rules, but it has not violated them. Even in the latter case, the target can still raise a number of climate-washing concerns as discussed below, but it is not a Type 1 claim.

The first step in the analysis would be to examine the relevant standard under which CVS adopted its Scope 3 target in 2021.[254] That appears to be *The SBTi Net-Zero Criteria* ("road test" Version 1.0, April 2020).[255] For near-term targets, that document references the SBTi *Corporate Near-Term Criteria*.[256] We then need to find the version of this document that was applicable during 2021.[257] In that version, companies are merely "recommended", but are not formally required, "…to choose the most recent year for which data is

252 *See Companies Taking Action*, SBTi, https://sciencebasedtargets.org/companies-taking-action (last visited Sept. 14, 2024).

253 *See* CCRM 2022, *supra* note 5, at 26.

254 To be sure, navigating the system of SBTi rules can be challenging.

255 *See The SBTi Net-Zero Criteria: Version 1.0, For Company Road Test*, SBTi (July 2021) [hereinafter SBTi, NET-ZERO CRITERIA (V1.0)], https://sciencebasedtargets.org/resources/files/SBTi-Net-Zero-Criteria-for-Road-Test.pdf.

256 *See id.* at 15.

257 *See* SBTi, CRITERIA AND RECOMMENDATIONS (Version 4.1, 2020) [hereinafter: SBTi, CRITERIA AND RECOMMENDATION (V4.1)], https://sciencebasedtargets.org/resources/legacy/2019/03/SBTi-criteria.pdf. Version 4.1 (and Version 4.2 which is identical in substance) were effective during the entirety of 2021. For effective dates for each version of the criteria, *see* SBTi, CRITERIA AND RECOMMENDATIONS (Version 5.0, 2021) 22–23, https://sciencebasedtargets.org/resources/files/Legacy-SBTi-criteria-V5.pdf.

available as the target base year."[258] Here, CVS may have rejected the recommendation, but did not violate a criterion. However, the document has another relevant criterion, which is titled "progress to date":

> C7—Progress to date: Targets that have already been achieved by the date they are submitted to the SBTi are not acceptable. The SBTi uses the year the target is submitted to the initiative (or the most recent completed GHG inventory) to assess forward-looking ambition . . .[259]

It is possible that CVS's target did not meet C7. Assume that at the time when CVS submitted its target to SBTi, it had already completed its 2020 GHG inventory. The relevant figures from that inventory seem to be 20.3 million tCO2 for 2019 (the base year), and 9.4 million tCO2 for 2020 (both Scope 3, Purchased Goods & Services, which is the relevant category under the target).[260] With required reduction of 47% from the 2019 base year, the level CVS must achieve under the target by 2030 is 10.8 million tCO2.[261] Clearly, that level of reductions had already been exceeded by 2020 when CVS stated 9.4 million tCO2 in its inventory. It follows that if CVS submitted its target when the 2020 inventory was already available, there is a plausible Type 1 claim in this case. Unfortunately, the date on which the target was submitted for validation is not easily available.[262] If the validation documentation were made public, it would be easier to make a determination of compliance.

Now contrast the analysis under the rules applicable circa 2021, with the current (2024) version of SBTi's Net-Zero Standard.[263] Under this updated standard, the updated "progress to date" criterion (C18) only applies to Scope 1–2 targets, such that it would not have

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[258] *See* SBTI, CRITERIA AND RECOMMENDATION (V4.1), *supra* note 257, at 6 (R3).

[259] *Id* at 6.

[260] *See* CVS HEALTH, *supra* note 251, at 34. *See also* CCRM 2022, supra note 5 (presenting CVS's reporting of emissions in CDP survey).

[261] 10.8 million tCO2 = 20.3 million tCO2*(1-0.47).

[262] For example, while the CDP's Climate Questionnaire includes an entry for the year the target was set-in, it does not provide specific dates. *See CDP Data Licenses*, *supra* note 248.

[263] *See* SBTi Net-Zero Standard, *supra* note 141.

applied to CVS's Scope 3 target.[264] Thus, if CVS were to submit under the now prevailing standard, its submission would not seem to raise the compliance concern that arises under the earlier standard. The new standard does state that "…base year emissions should be representative of a company's typical GHG profile."[265] However, since this language does not appear in the numbered criteria, it is unclear what its normative status is. It is also unclear what test SBTi would use to assess the "representativeness" of a given year's emissions. In 2022, SBTi published a response to the 2022 CCRM.[266] That response seems to suggest that SBTi's approach to representativeness is quite accommodative to companies:

> We provide flexibility in the selection of the base year that companies use in the target formulation (i.e. language used to describe the target publicly). There are many legitimate reasons for a company's base year having higher emissions than surrounding years, including but not limited to years with unusual activity (e.g. the COVID-19 pandemic), mergers and acquisitions and business expansion.[267]

The case of CVS raises concerns regarding the weakness of this approach. In 2021, when CVS validated the target in question with SBTi, its reported Purchased Goods & Services emissions for 2018 and 2019 under previous CDP surveys were 11 million and 14.6 million tCo2 respectively.[268] CDP reports indicate that the 2019

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264 *See id*. at 38 (C18).

265 *Id.* at 21.

266 *See The SBTi Welcomes Stronger Scrutiny on Corporate Climate Target*, SBTi, (Feb. 6, 2022), https://sciencebasedtargets.org/blog/the-sbti-welcomes-stronger-scrutiny-on-corporate-climate-targets.

267 *Id.* at 2 (under "Base year selection").

268 The sources noted *infra* in notes 268–270 are responses submitted by CVS as part of CDP surveys. For ease of access, they can be found under the names "CVS, CDP, 2023.html"; "CVS CDP 2022.html"; "CVS, CDP, 2021.html"; and "CVS, CDP, 2019.html" at https://urldefense.proofpoint.com/v2/url?u=https-3A__o365coloradoedu-2Dmy.sharepoint.com_-3Af-3A_g_personal_naor2878-5Fcolorado-5Fedu_Ehsx4zsxEfNGpaQBj-2D8JB0EBT3JEbB8L4IJmezqbKKHYMA-3Fe-3D6ZD26x&d=DwMGaQ&c=slrrB7dE8n7gBJbeO0g-IQ&r=ag_nGuS1CiQEwhSWt_at0w&m=HPSrVcM37H1QHxXIEij2qlWZHEcRDA9vzNNrXbNzUEYrfAAkKnB4PIgNeGHrHlE8&s=bd-7L0BOAwgUTMxikmVJ9jS7TlZULACst_VtvcfxNv8&e=. *See* CVS, *CVS Health—Climate Change 2023*, CDP WORLDWIDE (last visited May 23, 2025) [hereinafter CVS CDP 2023]; CVS, *CVS Health—Climate Change 2022*, CDP WORLDWIDE (last visited May 23,

figure was revised up to 20.3 million later, in 2022, apparently following a change in reporting methodology.[269] If so, given the different methodologies for 2019 and previous years, it is unclear how SBTi would assure representatives of 2019 as the base year. SBTi's comments regarding unusual business activity (e.g., COVID-19 pandemic) and mergers and acquisitions also seem unconvincing. If the decline in 2020 emissions was precipitated by COVID, generally speaking, one would expect (1) that decline to be temporary and (2) for 2020 to present a decrease in the company's sales to explain the reduction in emissions. Data indicates the opposite conclusions. CVS's emissions remained far below 2019 levels past 2020, through 2021–2022 (the most recent data point at the writing).[270] Meanwhile, CVS's revenues have increased through every year in that period.[271] As far as mergers and acquisitions, merger activity would

2025) [hereinafter CVS CDP 2022]; CVS, *CVS Health—Climate Change 2021*, CDP WORLDWIDE (last visited May 23, 2025) [hereinafter CVS CDP 2021]; CVS, *CVS Health—Climate Change 2019*, CDP WORLDWIDE (last visited May 23, 2025) [hereinafter CVS CDP 2019]. In the 2021 survey, Item C4.1a reports "covered emissions in base year" of 14,584,739 tCO_2e for the Scope 3 Purchased Goods & Services target for 2019. CVS CDP 2021, *supra* note 268. In the 2019 survey, Item C6.5 reports purchased goods and services emissions of 10,986,342 tCO_2e for 2018 (the reporting year is defined as 2018 in Item C0.2 of the survey). CVS CDP 2019, *supra* note 268.

[269] *See* CVS CDP 2022, *supra* note 268. Item C5.2 reports 2019 Purchased Goods and Services base year emissions of 20,258,908 tCO_2e.

[270] *See* CVS CDP 2023, supra note 268. Item C4.1a reports Scope 3 Purchased Goods and Services emissions of 12,959,465 tCO_2 for 2022 (for reporting year definition as 2022, see Item C0.2). Item C6.5a reports Purchased Goods & Services emissions 7,636,483 for 2021. Interestingly, in Item C5.2, CVS cites a change in methodology for measuring Purchased Goods and Services which led to a recalculation and further increase of its 2019 Purchased Goods & Services target baseline from 20,258,908 tCO_2e to 23,189,939. The even higher baseline figure relative to 2021 and 2022 emissions further accentuates the concerns regarding the lack of forward-looking ambition.

[271] *See* CVS Health Co., Annual Report, (Form 10-K) 106 (2022), https://www.sec.gov/Archives/edgar/data/64803/000006480323000009/cvs-20221231.htm#i1ae8e8cf4da649e4afa2b073939999d2_106. *See also* CVS Health Co., Annual Report, (Form 10-K) 101 (2020), https://www.sec.gov/Archives/edgar/data/64803/000006480321000011/cvs-20201231.htm#ic31760c417ad43309 4d37b2420225748_103. CVS's income statement reports rising revenues from 2018 to 2022: $184 billion (2018); $185 billion (2019), $191 billion (2020), $204 billion (2021), and $227 billion in 2022. See CVS Health Co., Annual Report, (Form 10-K) 101 (2020) and CVS Health Co., Annual Report, (Form 10-K) 105 (2022).

indeed increase the acquiring company's emissions in the merger year, but we would expect that increase to be maintained in subsequent years. That is clearly not the case with CVS. If CVS and SBTi had legitimate reasons to select 2019 as the base year, those reasons should have been documented as part of the validation process and shared with the public for transparency.

To summarize, Type 1 claims represent an important tool to address climate-washing concerns in targets. Their key benefit is the ability to reference non-compliance with rules that a company claimed to have followed (and that SBTi advertised to have validated). To date, CCRM has played an important role in flagging instances of *potential* non-compliance, but identifying *actual* non-compliance requires additional information and documentation. Opportunities for scrutiny are currently hampered by lack of information that could be easily provided by regulators, SBTi, and companies themselves. In its 2022 response to CCRM, SBTi invited stronger scrutiny of its validation process.[272] For this invitation to be credible, SBTi would need to share the relevant information.

2. Type 2: Misleading Consumer Perception about Target Ambition

Type 2 concerns refer to instances where a given corporate target complies with the target framework, but the target framework itself raises climate-washing concerns because it misleads consumer perceptions about the target's ambition. Consider the following examples, which were discussed in Part III:

- Under the so called "expansive boundary approach," SBTi criteria for near-term targets allow companies to exclude 33% of Scope 3 emissions from near-term targets.[273] As discussed above, his rule significantly dilutes overall target coverage given that Scope 3 emissions account for the lion's share of most companies' emissions. The CCRM expresses concern with the 33% exception and its own methodology requires full (100%) inclusion of Scope 3 emissions under target.[274]

[272] *See* SBTi, *supra* note 266.

[273] *See* SBTi Net-Zero Standard, *supra* note 141, at 25–26.

[274] Day et al., *Guidance and Assessment Criteria for Good Practice Corporation Emission Reduction and Net-Zero Targets*, NEWCLIMATE INITIATIVE 15 (Apr.

> At times, SBTi rules allow companies to set Scope 3 near-term targets at the (slower) reduction rate of WB2C, while still classifying their overall targets as 1.5°C-aligned (and thus more ambitious).[275] Here as well, the CCRM expresses concern that "[t]emperature classifications of target validations for 2030 usually do not apply to large shares of companies' value chains."[276]

While these examples clearly raise climate-washing concerns, it is important to articulate the normative grounds for these concerns. This brings us back to climate science and the global carbon budget. One might argue that exclusion of 33% of Scope 3 emissions, or the slower rate of reduction for Scope 3 emissions, is inconsistent with the scientific principles underlying the global carbon budget. However, as discussed above, that may not be a convincing claim. The global carbon budget is indeed global. Decisions about Scope 3 are about allocating the responsibility for reductions to different companies. The inherent discretion involved in that task

2024), https://newclimate.org/sites/default/files/2024-04/NewClimate_CCRM 2024_Methodology.pdf; *see also* CCRM 2024, supra *note* 5, at 21, 25; CCRM 2023, *supra* note 5, at 35 (near-universal coding of SBTi targets for "exclusion of significant emissions share").

275 For cross-sectoral absolute targets, *see* SBTi Net-Zero Standard, *supra* note 141, at 39. For sector-specific intensity targets, readers should also consult the specific sectoral guidance in *Standards and Guidance,* SBTI, https://sciencebasedtargets.org/sectors (last visited Apr. 27, 2025). Note that SBTi presents the Net-Zero Standard as aligned with a 1.5°C pathway. *See* SBTi Net-Zero Standard, *supra* note 141, at 9 ("The SBTi initiated a scoping phase of work in 2019 to develop a framework enabling companies to set robust and credible net-zero targets in line with a 1.5°C future"); *see also* SBTi Net-Zero Standard, *supra* note 141, at 12–14 (definitions of "net-zero" and "near-term science-based target"). While SBTi acknowledges in a footnote that near-term Scope 3 targets are only aligned with WB2°C pathways, this appears less as a valid qualification and more of a contradiction of terms. *Id.* at 14, n1. Namely, it is problematic for SBTi to advertise a standard as 1.5°C aligned when the vast majority of emissions covered under near-term targets follow WB2°C.

276 CCRM 2024, *supra* note 5, at 25. *See also* CCRM 2023, *supra* note 5, at 35 tbl.9, 162 tbl.19. In the table created by CCRM, nearly all of the dozen or so companies with SBTi-validated near-term targets for 1.5°C have a caption reading: "temperature alignment provided for s1 and s2 targets only (s3 target listed on SBTi webpage, but not covered by provided temperature alignment for s1 & s2)." Exceptions: Mercedes-Benz and Volkswagen, where two different classifications exist for the target (e.g., 1.5C/WB2C). *Id.* at 162 tbl.19.

makes the SBTi criteria more difficult to justify in purely scientific terms, but it also makes them more difficult to criticize as inherently inconsistent with science. When the nature of the issues involved lie beyond the domain of science, it is unhelpful to refer to the resulting decisions as either "consistent" or "inconsistent" with science. Consequently, for many of the most important decisions SBTi makes, the claim that an SBTi rule is "inconsistent with science" would be inapposite.

In these instances, a more direct normative concern would be the misleading of consumer perception. The relevant SBTi rule may or may not be consistent with science, but the way in which the targets are advertised has the potential of misrepresenting their significance to a reasonable consumer. For example, some of the concerns can be stated as follows:

- When reading about a company's target, consumers may reasonably understand that target to apply to all of the company's emissions. Excluding significant portions of emissions from the target can therefore amount to misleading consumer perception.
- When reading about the temperature classification of a company's target (e.g., 1.5C), consumers may reasonably understand the classification to apply to all of the company's emissions, such that all emissions would be reduced by the global rate corresponding to temperature classification (e.g., for 1.5C, 42% by 2030).[277] Referring to a target as aligned with a more ambitious classification (1.5C) when only a subset of emissions (Scopes 1–2) need to be reduced at the corresponding rate can be misleading to consumers.

Plaintiffs seeking to establish climate liability will find that a UDAP theory offers powerful tools. Under a UDAP theory, a plaintiff seeking to establish UDAP liability arguably does not need to demonstrate that a company's environmental claims are inconsistent with science. This is because with a UDAP theory, the focus is not on the false nature of the marketing claim (as in a fraud theory), but

[277] For targets following the SDA (sectoral decarbonization approach), the rate of reduction in intensity targets would need to correspond to the reduction required by the relevant technological pathway used in the SBTi guidance (e.g., IEA NZE2050). *See supra* Part II.B.1.

rather on the truthfulness of the meanings that a reasonable consumer may draw from the marketing claim.[278] In a webinar about the Green Guides, FTC Division of Enforcement staff specifically highlighted that the meaning of a marketing claim is assessed from the perspective of reasonable consumers, rather than the correct technical meaning that would be accessible to scientists and other subject matter experts.[279] Thus, a scientist or climate expert may know that when a company advertises "… a science-based target to keep global warming below 1.5C," that target might not cover all of its emissions, but that technical understanding is inapposite. Consumer perception is often determined empirically through group studies where subjects are presented with specific marketing claims and offered several meanings to choose from. If a substantial portion of consumers choose a certain meaning, that meaning would qualify as consumer perception.[280]

Another UDAP principle that can inform litigation of Type 2 claims concerns qualifications and disclosures.[281] Using this principle, companies (and SBTi) can avoid liability by qualifying their claims so as to alert reasonable consumers. For example, a company could offer a qualification that only X percent of the companies'

[278] *See*, *e.g.*, FTC Green Guides, *supra* note 223, § 260.2 ("To determine if an advertisement is deceptive, marketers must identify all express and implied claims that the advertisement reasonably conveys. Marketers must ensure that all reasonable interpretations of their claims are truthful, not misleading, and supported by a reasonable basis before they make the claims."). Thus, if a marketer's advertisement is technically correct, but can be reasonably interpreted as conveying an additional meaning that is incorrect, that advertisement may still be deceptive.

[279] *See* Julia Solomon Ensor, *Federal Trade Commission Green Guides, The Sustainable Materials Management Webinar Series*, YOUTUBE 06:17 (Feb. 6, 2022), https://www.youtube.com/watch?v=IpVOKglhn9U ("So again, I can't say it too many times, consumer perception controls when it comes to the Green Guides. How do consumers understand your claims? It doesn't matter how a scientist would understand your claim, or how someone else in the environmental field might understand it, the question is how does the consumer when they look at your claim in context understand.").

[280] For examples of the FTC's approach to quantitative thresholds in consumer perception studies, *see* FTC GREEN GUIDES: STATEMENT OF BASIS AND PURPOSE 72, 78 (2012), https://www.ftc.gov/sites/default/files/attachments/press-releases/ftc-issues-revised-green-guides/greenguidesstatement.pdf (defending the Green Guides' approach on timing of emissions reductions and citing a consumer perception study where 43% of respondents found the relevant statement misleading).

[281] *See* FTC Green Guides, *supra* note 223, § 260.3(a).

total emissions are included under the science-based target. Under the FTC's *Green Guides*, for such a qualification to be valid, it must meet certain requirements,

> [M]arketers should use plain language and sufficiently large type, should place disclosures in close proximity to the qualified claim, and should avoid making inconsistent statements or using distracting elements that could undercut or contradict the disclosure.[282]

Thus, the fact that target features are specified in lengthy reports, or that consumers may consult the SBTi criteria, is inapposite. Qualifications must be 'in close proximity' to the qualified claim.

3. Type 3: Inconsistency with Science

Type 3 concerns refer to instances where specific rules in the target framework are inconsistent with science. Like Type 2 claims, the concern is with the target framework itself, rather than non-compliance by an individual company. But unlike Type 2, the normative concern is not with a general claim regarding misleading of consumer perception, but with a specific inconsistency between the target rules and climate science. For an example of a Type 3 concern in action, recall our previous discussion of sectoral aviation targets.

SBTi's Aviation Sector Guidance sets intensity targets for airlines based on technological pathways from external experts.[283] These expert pathways rely on assumptions regarding the growth rate in demand for air-travel.[284] As we have seen in Part II, if the actual growth rate exceeds the assumed growth rate, total airline emissions can exceed their sectoral carbon budget (while still meeting their near- or long-term science-based intensity targets).[285] Also noted above was analysis by ABN-AMRO demonstrating this exceedance to be likely. Accordingly, ABN-AMRO's analysis found that KLM's

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[282] *Id*.

[283] *See supra* Part II.B.3.

[284] *See supra* Part II.B.3.

[285] As discussed in *supra* note 120 and adjacent text, SBTi tries to prevent this outcome by requiring companies to forecast activity growth data as part of SDA target validation, and adjust their convergence path (year-by-year targets) based on that data. For the reasons stated there, that approach, while workable in theory, is limited in practice.

intensity target, when "…translated into an absolute emissions figure does not seem to align with the Paris Agreement."[286]

In contrast to a Type 2 claim, the concern here is not (only) with misleading marketing claims, but with specific technical shortcomings in SBTi's derivation of the target from the underlying sectoral pathway. In other words, the concern is that in these specific circumstances (forecasted growth likely to far exceed pathway assumptions) it is illegitimate to claim the intensity targets are derived from the pathway.[287]

As far as legal liability is concerned, making the claim directly through science (Type 2) rather than consumer perception (Type 3) has advantages and disadvantages. An important advantage is that some issues are so complex and technical, that reasonable consumers may not draw any relevant meanings regarding them. For example, it may be relatively easy to prove that a reasonable consumer assumes a target covers substantially all of a company's emissions. But it may be more challenging to prove what a reasonable consumer assumes from a target regarding growth in future flying activity. By going directly to the science, a plaintiff can potentially side-step these issues. Raising Type 3 claims can also have disadvantages relative to Type 2 claims. The litigation of a Type 3 claim would be based on highly technical aspects of climate science and policy. A plaintiff would need to establish the relevant evidence through expert witness testimonies and prevail in the "battle of experts" between conflicting testimonies.[288]

4. Type 4: Over-Emphasizing the Role of Science

The fourth and final type of climate-washing claims refers to instances where companies or SBTi over-emphasize the role of

286 *See* ABN-AMRO, *supra* note 114, at 4.

287 It is worth noting that parallel to SBTi's targets for airlines, SBTi issues targets for aviation users. *See* SBTI, AVIATION GUIDANCE, *supra* note 114, at 28. One potential claim on behalf of SBTi may be that when the two target systems (airlines and users) are taken as a whole, activity levels will be kept at the relevant climate scenario level. This hypothetical argument is problematic insofar as it shifts responsibility for activity levels away from the entity (airline) subject to the target.

288 For the challenges presented by conflicting scientific expert testimonies, *see* Gustavo Ribeiro, *No Need to Toss a Coin*, 12 LAW, PROBABILITY & RISK 233, 233–34 (2013), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2128915.

science in the target rules. Type 4 is broader than Type 2, where there are more specific ways one can indicate as to why target rules are misleading (e.g., because rules carve out emissions while consumers believe the target to be all-inclusive). Type 4 claims are also broader than Type 3 claims that deal with direct inconsistencies with science. Rather, the concern with Type 4 is with the notion that science is being used to lend credibility to a target in illegitimate ways. This may be because there is no consensus on the relevant issue in the expert community. Or even more commonly, because the relevant issue has significant policy dimensions that lie beyond the purview of science.

Consider the following examples from our previous discussions as potential Type 4 claims:

- The target-setting methods provided in SBTi criteria generally ignore the CBDR-RC principle which is part of the Paris Agreement.[289] These methods arguably result in an inequitable distribution of the remaining carbon budget between developed and developing countries.[290] The concern here is not that consumers were misled to believe the target incorporated CBDR-RC, as reasonable consumers may not even be aware of the principle (hence, not a Type 2 concern). The concern is also not that SBTi's rule is inconsistent with science, because science cannot decide whether or how to apply CBDR-RC (hence, not a Type 3 concern). Rather, the concern here is that science is stretched beyond its domain to lend legitimacy to a specific allocation of the remaining carbon budget, i.e., a Type 4 concern.
- SBTi's sectoral targets are based on technological pathways developed by expert bodies like IEA.[291] The way that sectoral carbon budgets are allocated in these pathways is often based on cost-optimization models, in ways that can be controversial within the expert

289 *See supra* Part II.B.2.

290 Because CBDR-RC is part of the Paris Agreement, one might argue that the resulting targets are also inconsistent with that agreement. *See* Paris Agreement, *supra* note 25, art. 9, 10.

291 *See* SBTi, SDA (2015), *supra* note 69, at 7.

community.[292] For example, as Peeters et al. (2023) noted in the context of aviation, reliance on cost-optimization can take for granted high levels of consumption of goods and services by affluent demographics.[293] The result is an inequitable allocation of the remaining carbon budget. Here again, the concern is that science is stretched beyond its domain. Cost-optimization is elevated from one normative approach to carbon budget allocation to a "science-based" approach. Hence, this too is a Type 4 concern.

- SBTi Scope 3 targets are generally based on the minimum accounting boundaries provided in the GHG Accounting Protocol.[294] As noted above, these accounting boundaries can be controversial.[295] In some instances, boundaries may be misleading to consumers and give rise to Type 2 claims. For example, when a franchisor announces a target, reasonable consumers may infer that the target broadly covers the franchisees emissions, which may not be the case. In other instances, the topic may be too technical for reasonable consumers to draw meanings. For example, reasonable consumers may not make relevant assumptions as to whether a company has to include the lifecycle carbon of its leased assets and equipment. This is not a Type 2 claim, but nevertheless, if the relevant boundary definition is controversial within the policy community, it may give rise to a Type 4 claim. The reason is that science is being over-emphasized to lend credibility to a rule that is primarily allocational in nature.
- The role that credits (and related concepts) play in targets may give rise to a host of climate-washing concerns, including Type 4 concerns. Companies with SBTi FLAG targets may count carbon removals in ways that are inconsistent with the rule framework, or

292 *See* discussion *supra* Part II.B.1.

293 *See* discussion *supra* Part II.B.1.

294 *See* discussion *supra* Part III.B.1.

295 *See* discussion *supra* Part III.B.1.

> with scientific principles.[296] This would give rise to Type 1 and Type 3 concerns, respectively. In other cases, the concern would be more structural, such as SBTi allowing the market-based approach (Scope 2 accounting), or SBTi's pending decision regarding the Scope 3 Flexibility Claim. These are controversial issues within the climate policy community. Again, the concern here would be that the term "science-based" is lending undue credibility to a position in a policy debate that is not scientific in nature.

From a liability point of view, the Green Guides offer two key concepts that may be useful for making Type 4 claims. The first is that marketers must be able to substantiate their marketing claims when called to do so ("substantiation"). In the context of environmental claims, substantiation "…often requires competent and reliable scientific evidence."[297] The second concept is the notion of a "general environmental benefit claim," for example, a claim that a product is "eco-friendly," "environmentally friendly," etc.[298] The Green Guides are inherently suspicious of unqualified general benefit claims, because these claims can be especially challenging for marketers to substantiate:

> Unqualified general environmental benefit claims are difficult to interpret and likely convey a wide range of meanings. In many cases, such claims likely convey that the product, package, or service has specific and far-reaching environmental benefits and may convey that the item or service has no negative environmental impact. Because it is highly unlikely that marketers can substantiate all reasonable interpretations of these claims, marketers should not make unqualified general environmental benefit claims.[299]

To establish liability in Type 4 claims, plaintiffs may argue that terms like "science-based targets," "Paris-aligned," "1.5C-aligned," etc., are essentially general benefit claims. These claims place the

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296 *See* discussion *supra* Part III.C.2.

297 *See* FTC Green Guides, *supra* note 223, § 260.2. For substantiation under general UDAP law (as distinct from environmental marketing claims), see FTC Policy Statement Regarding Advertising Substantiation, 104 F.T.C. 839 (1984).

298 *See* FTC Green Guides, *supra* note 223, § 260.4.

299 FTC Green Guides, *supra* note 223, § 260.4(b).

burden on defendants to support the claims through "competent and reliable scientific evidence." Defendants could, of course, provide citations to the global carbon budget, but key aspects of the targets—target setting methods like the ACA and SDA, accounting definitions used, the role of market-based Scope 2 accounting, etc.—would need to be separately substantiated. From here, the plaintiff's argument could take one of two versions. Under one version, plaintiffs can argue that reasonable consumers may understand "science-based target" to mean "targets that can be derived directly from natural science." If so, the claim cannot be substantiated because the literature on issues like the ACA, SDA, and so forth, is not a natural science literature.

In the second version of the argument, plaintiffs can concede a broader definition of the term "science-based target," for example, one that includes the body of technical expertise regarding technological pathways, carbon accounting, and climate policy more generally. Instead of focusing on science as "natural science", the claim here would be that substantiation requires some measure of expert consensus on the relevant topic. The *Green Guides* make clear that scientific evidence "should be sufficient in quality and quantity based on standards generally accepted in the relevant scientific fields, when considered in light of the entire body of relevant and reliable scientific evidence, to substantiate that each of the marketing claims is true."[300] The plaintiffs' claim here would be that due to controversies in the expert community (around specific target setting methods, the role of credits, etc.), the necessary level of expert consensus has not been met by defendants.

As in all matters UDAP, potential defendants can avoid liability for general benefit claims by appropriately qualifying their claims.[301] Such qualifications would need be consistent with the criteria discussed above (e.g., being clear, prominent, and understandable).[302] Applying this requirement to our context, SBTi and companies using its target may provide clear and prominent qualifying language such as the following: "While the targets are based on the scientific global carbon budget, they require important non-scientific decisions by

[300] *See* FTC Green Guides, *supra* note 223, § 260.2.

[301] *See id.* at § 260.3(a); *supra* Part IV.C.2, discussion in text adjacent to notes 280–282.

[302] *Id*.

SBTi. Those can materially affect the level of emissions reductions required."

Up to this point, the discussion of Type 4, like the other concerns, has focused on the question of legal liability. But especially with respect to Type 4, additional institutional avenues may also be important to pursue. Standard-setting bodies like SBTi obtain credibility by appealing to science and technical expertise in ways that deemphasize the normative and policy choices embedded in their standards. The result is a legitimacy gap where normative decisions by some private organizations receive an outsized role in shaping global climate policy. How to bridge that legitimacy gap is a complex question, and one that largely lies beyond the scope of this Article. Nevertheless, I offer a number of thoughts to relate the case of SBTi to questions in the broader field of private environmental governance (PEG).[303]

In a recent contribution, Joshua Galperin analyzes the "democracy deficit" that PEG initiatives face.[304] Galperin distinguishes between two different strategies to democratize PEG, internal and external. Internal strategies are those that incorporate democratic principles into the workings of the PEG organization, for example by providing opportunities for petitioning and notice and comment. External strategies include the ways in which democratic institutions can engage with PEG, for example through administrative agencies initiating a rulemaking process on a subject matter presently governed by a PEG initiative. In both cases (internal and external), the ultimate goal, from Galperin's point of view, is to generate a lively public discussion with a diversity of stakeholder perspectives.

The distinction between internal and external strategies is useful when considering SBTi. One internal strategy to address SBTi's legitimacy gap is to increase the diversity of stakeholders participating in SBTi's decision-making process. For example, this participation should include voices from the developing world on issues like the role of CBDR-RC in corporate targets. There is need for social-scientific work to assess the degree to which current SBTi governance benefits from such diversity of views. It is encouraging, for example, that a researcher who critiqued SBTi's methodologies is a

303 *See* discussion *supra* INTRODUCTION, text around note 12.

304 *See* Galperin, *supra* note 20, at 766.

member of its Technical Council.[305] At the same time, there have been concerns about the oversized role that large corporate actors play in SBTi decision making.[306] For example, the SBTi FLAG Guidance was funded in part by companies with large land use emissions including Danone, Mars, Cargill, IKEA, Kimberly Clark, General Mills Foundation, and Tyson, who would all be subject to the standard.[307] Industry involvement can be beneficial insofar as it harnesses on-the-ground knowledge and increases buy-in. But it raises the risk that the interests under consideration are disproportionately those of industry. We should be concerned with an outsized industry voice in SBTi for the same reason we are concerned with, say, the outsized involvement of fossil fuel industry representatives in COP28.[308] With external strategies, administrative agencies (and potentially, legislatures) may initiate rulemaking (or even legislation) on subject matter areas presently covered by SBTi. The 2024 CCRM seems to call for a shift in that direction.[309] In the U.S., the point of departure is that administrative agencies generally lack the authority to directly set corporate climate targets. However, there are myriad indirect ways in which administrative agencies' authorities do intersect with SBTi's activities. The Biden Administration's 2022 proposed *Federal Supplier Climate Risks and*

305 *See*, *e.g.*, *About Us: Dr. Anders Bjørn*, SBTI, https://sciencebasedtargets.org/about-us/technical-council/dr-anders-bj%C3%B8rn (noting that Bjørn's work includes "[T]translating different ethical principles for allocating scarce resources into environmental impact allowances for specific actors."); *see also* Bjørn et al., *supra* note 10; Bjørn et al., *supra* note 41.

306 *See* CCRM 2024, *supra* note 5, at 62 ("The integrity of the current corporate accountability system is impaired by inherent tensions deriving from a lack of institutional separation and direct corporate influence . . . Companies often hold significant influence over activities under specific accountability functions, despite them being the entities to be held accountable for.").

307 *See* SBTI FLAG GUIDANCE, *supra* note 109, at 3. Similarly, the 2023 CCRM expresses alarm at the role that major companies played in the GHG Protocol's recent *Guidance for corporate accounting of land sector emissions and removals* and its relationship to a controversial SBTi position in its new FLAG standard. *See* CCRM 2023, *supra* note 5, at 66.

308 *See* Julia Simon, *A Record Number of Fossil Fuel Representatives Are at This Year's COP28 Climate Talks*, NPR (Dec. 7, 2023), https://www.npr.org/2023/12/07/1217504214/a-record-number-of-fossil-fuel-reps-at-cop28-climate-talks.

309 *See* CCRM 2024, *supra* note 5, at 63.

Resilience Rule uses the agencies' authority over acquisitions to encourage climate targets for federal suppliers (directly incorporating SBTi standards);[310] the SEC's *Climate Disclosure Rule* (currently stayed) regulates the information registrants provide about their targets;[311] the FTC's *Green Guides* govern deceptive environmental claims that may cover targets, and so on and so forth. All of these instances provide opportunities for administrative agencies to engage in a public process to determine what rules corporate climate targets should follow to merit a seal of alignment with the Paris Agreement. Of course, the administrative (and legislative) processes come with their own risks of outsized influence by corporations through lobbying and regulatory capture. While attempts at external strategies will often fall short of bringing legal changes, Galperin's work reminds us that the project of democratizing PEG has a broader goal in mind: reclaiming standards that seem private and technical as ultimately public and political.

CONCLUSION

Whatever the mix of strategies—legal liability, internal governance, external regulation—so much is clear. Scrutiny over climate-washing in corporate target frameworks is becoming a central concern for climate advocacy. Advocates need to master the technical and often intricate body of knowledge around target frameworks. At one level, that knowledge is required to expose climate-washing through tools like compliance reviews, consumer perception studies, and scientific reviews (climate-washing concerns Types 1, 2, and 3, respectively). At another level, that knowledge is required to see that what passes for "science-based targets" today often involves high-stakes, non-scientific normative choices (Type 4 concerns). Here, the central question for advocates to ask is: what should corporate climate targets become, and what role should they play in climate governance, once we understand them as scientifically-informed, but ultimately values-based?

310 *See* 48 C.F.R. § 68312.

311 *See* 17 C.F.R. § 210, 229, 230, 232, 239, and 249 (2024).