

TEMPORAL INCONSISTENCY IN SUSTAINABILITY DISCLOSURE

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Abstract

Firms are under increasing pressure from stakeholders both to disclose information about their impacts on sustainability issues and to create targets for improvement on these issues. Principles of ethical and reliable reporting require firms to maintain consistency in their reporting over time, and stakeholders often assess firms based upon targets they set, but we know little about the degree to which firms maintain targets once they are set. We focus on climate (GHG emission) targets in a sample of S&P 500 firms over more than a decade. These targets are of great societal importance and are also relatively easy for firms to alter. We refer to material yet unaccounted-for changes in these targets as temporal inconsistency and hypothesize that such inconsistencies are highly prevalent. We also expect a greater incidence of temporal inconsistency in sectors that are more carbon dependent, and that inconsistency is negatively associated with achieving targets. Finally, we outline several patterns of temporal inconsistency and document their frequency in our sample.

Keywords: climate change, GHG emission targets, sustainability disclosure, temporal inconsistency

INTRODUCTION

Corporate sustainability reporting is the main vehicle by which firms communicate how they

manage their socioenvironmental dependencies and impacts, and what short and long-term commitments they are implementing (Giddings, Hopwood, & O'Brien, 2002). While the purpose of such disclosure is to better understand what firms' sustainability risks and impacts are, and how their commitments aim to improve the state of the planet and society, scrutinizing firms' actual activities is difficult due to the absence of clear standards and regulations. As such, companies largely depend on self-disclosure, monitoring of which relies on stakeholders' abilities to assess firms' efforts to address sustainability challenges. For instance, in the face of an ever more urgent environmental crisis (WMO, 2025), stakeholders' expectations of companies' disclosures on greenhouse gas (GHG) emissions have increased (Chithambo, Taurigana, Tingbani, & Achiro, 2022), and companies are asked to set stringent GHG emission reduction targets (e.g. Bjørn, Tilsted, Addas, & Lloyd. 2022). However, disclosure on climate change does not necessarily seem to impact firms' behaviors (Fung, Graham, & Weil, 2007), and not all disclosure is of high quality (Marquis, Toffel, & Zhou, 2016), raising questions about corporate commitments to climate change. Prior studies have shown that firms' statements and commitments can be vague, partial, misleading, or otherwise irregular (Fabrizio & Kim, 2019; Montgomery, Lyon, & Barg, 2024) —in other words, firms can be inconsistent in their sustainability disclosure.

Extant research has focused primarily on how inconsistent disclosure plays out at a given point in time (i.e., a single reporting period), through examinations of greenwashing (Bernini, Giuliani, & La Rosa, 2024), impression management (Gaim, Clegg, & Cunha, 2021), obfuscation (Bushee, Gow, & Taylor, 2018), and other related phenomena. What is largely still under-investigated is a temporal perspective on

inconsistent sustainability reporting (Bansal & DesJardine, 2014). We define *temporal inconsistency* as major changes in sustainability disclosures by the same entity, over two or more time periods, which are unaccounted for in subsequent disclosures. We focus only on *unexplained* changes in disclosure—and explicitly exclude inconsistencies that are communicated subsequently—as companies may need to adjust their commitments over time as their understanding and expertise of tackling a topic like climate change develops.

While some research has been conducted in this space (Callery & Kim, 2025; Malen, 2022), we are still missing a comprehensive understanding of the extent to which companies drift away from their original socioenvironmental commitments over time. This research lacuna is perplexing for three main reasons. First, sustainability is, by definition, a long-term endeavor rather than a one-off investment (Brundtland, 1987). An unwavering, steadfast pursuit is thus better suited to achieving sustainability goals than an inconsistent approach. This is especially apparent on topics like climate change, as corporations make statements about their intended GHG emissions reductions well into the future (Christensen, Morsing, & Thyssen, 2020), for example, to reach net-zero by 2050 or even beyond.

Second, temporal (in)consistency is a critical area of research due to its pertinence in disclosure practices more generally. Research on financial reporting practices has shown that applying consistent disclosure over time is beneficial to stakeholders, as it enables investors, creditors, and regulators to identify similarities and differences in corporate activities over time (Peterson, Schmardebeck, & Wilks, 2015). These principles of ‘good corporate governance’ were also adopted by prominent non-financial disclosure frameworks such as the Global Reporting Initiative (Etzion, Gehman, Ferraro, & Avidan, 2017), the GHG protocol (WBCSD & WRI, 2004), and the Science Based Targets initiative (SBTi, see, e.g., Bjorn et al., 2022). Stakeholders use such sustainability disclosures to hold companies accountable to their long-term commitments, in an analogous manner to how they use financial disclosures. If disclosures are inconsistent over time, however, stakeholders

struggle to keep track of company’s practices. Long-term promises spanning several time periods become more difficult for stakeholders to evaluate, because distant evaluations are time consuming, costly, and open to different interpretations (Berg, Kölbel, & Rigobon, 2022; Impink, Paananen, & Renders, 2022).

Third, temporally inconsistent disclosures can present ethical concerns, because when firms engage in this practice they fall short of ideal ‘good corporate governance’ standards that “integrate ethical leadership, transparency, and a commitment to sustainability” (Aguilera & Ruiz Castillo, 2025, p. 336). While companies may need to make adjustments to sustainability commitments, such as GHG reductions, as time passes, making changes that are *unaccounted* for means firms may intentionally or unintentionally break promises made to stakeholders (Seele & Gatti, 2017). Moreover, since monitoring of temporal disclosure can be a struggle for stakeholders as argued above, failure to account for abrupt changes made to corporate GHG emissions goals and activities—even if this takes place due to oversight rather than intentional misrepresentation—violate the underlying ethics principles of corporate communication to stakeholders: comprehensibility, truth, sincerity, and legitimacy (Forester, 1993; Patelli & Pedrini, 2014).

In this paper, we examine the degree to which firms’ sustainability disclosures are (in)consistent over time, using a sample of GHG emission reduction targets of S&P500 companies. We develop a conceptual model of temporal inconsistency, and a subsequent series of hypotheses, regarding 1) how frequently temporal inconsistency might occur, 2) which organizations are likely to engage in it, and 3) how it is related to ultimately achieving GHG emission goals. Our quantitative analyses lend support to our hypotheses. We find temporal inconsistency to be quite prevalent, especially in sectors with higher carbon dependence. In other words, the very firms that create the most climate damage are the ones most likely to display temporal inconsistency in their goals. We also find that temporal inconsistency is negatively associated with attaining GHG goals firms have set. Finally, we develop a set of temporal inconsistency prototypes that demonstrate there

are different dimensions along which firms may change or omit information over time, without providing a proper explanation. In addition to contributing to the emerging body of literature highlighting temporal aspects of sustainability (Blagoev, Hernes, Kunisch, & Schultz, 2024), our paper sheds light on the role of GHG target consistency (or lack thereof) in achieving long-term GHG emission reductions (Dahlman, Branicki, & Brammer, 2019).

LITERATURE REVIEW: INCONSISTENCY IN CORPORATE SUSTAINABILITY DISCLOSURE

A vast body of literature has documented various manifestations of inconsistencies between corporate communication, action, and the external standards that guide such conduct, often referred to as decoupling of practice from structure (Meyer & Rowan, 1977). Other forms of decoupling arise when firms are unable to meet strict standards (means-ends decoupling) or pursue unclear goals that lend themselves to ambiguous interpretations (Behnam & MacLean, 2011; Wijen, 2014). A typical reason why companies decouple their communications from decisions and actions is that it provides them with the flexibility to deal with competing stakeholder demands (Crilly, Zollo & Hansen, 2021). In the context of sustainability, such gaps between what is disclosed and what companies end up doing is known as “greenwashing.” (Delmas & Burbano, 2011; Lyon & Maxwell, 2011; Short & Toffel, 2010). Such inconsistencies occur because sustainability lacks stringent and explicit enforcement mechanisms, thereby allowing significant leeway for organizational misinterpretation of expected disclosure norms, whether intentional or not, (Andrews et al., 2003; Bams & Van der Kroft, 2022; Boiral, 2007; Welch, Rana, & Mori, 2003). Montgomery et al. (2023) provide an account of how greenwashing strategies continue to evolve in the face of increasingly stringent regulation.

A particularly common type of greenwashing is selective disclosure, also known as “cherry-picking”, which is “a symbolic strategy whereby firms seek to gain or maintain legitimacy by disproportionately revealing beneficial or relatively benign performance indicators to obscure their less impressive overall

performance” (Marquis, Toffel & Zhou, 2016: 483). Doing so allows firms to appear to engage in sustainability actions but avoid the need to invest scarce resources, directing stakeholders’ attentions away from areas of weakness (McDonnell & King, 2013). Other somewhat overlapping nomenclatures, such as obfuscation (Bushee et al., 2018), organized hypocrisy (Cho, Laine, Roberts, & Rodrigue, 2015), and impression management (see, e.g., Cho, Michelson, & Patten, 2012) are employed in the sustainability accounting literature to describe a host of related practices; the provision of information in an obscure or non-comprehensible form, disclosing compromised information in different formats that are non-comparable and cannot be easily verified (Avidan, Etzion, & Gehman, 2019; Haller, Van Staden, & Landis, 2018). For instance, companies may hide their actual environmental performance through the use of complex language that gives an impression of engaging with sustainability but covers up the fact that environmental actions are not yet fully integrated into operations (Fabrizio & Kim, 2019).

What is striking about the current body of knowledge is that it focuses exclusively on *contemporaneous* disconnections between what companies say and what they do. Although the majority of the aforementioned studies use longitudinal datasets, they typically only employ time as a control variable (e.g., as yearly fixed effects) for the sake of making deductions and predictions that hold true on average. For example, research has identified both factors that affect the type of organizational response to information disclosure demands (Doshi, Dowell, & Toffel, 2013) and the effects of such responses on subsequent environmental performance (Ortiz-de-Mandojana & Bansal, 2016). Against this background, (in)consistency has been traditionally interpreted entirely as cross-sectional, e.g., as the extent of homogeneity of disclosure formats among different entities at any given point in time (Busch, Johnson, & Pioch, 2022). However, sustainability disclosure is not merely a long-term dialogue between the company and its stakeholders but one that signals the company’s commitment to future generations (Brundtland, 1987), subject to temporal dynamics (Bansal & DesJardine, 2014), and providing

ample opportunities for companies to engage in *temporal inconsistency*, whether intentionally or not. As such, *temporal inconsistency* involves a time lag between statements and their follow-up (or lack thereof).

The context of corporate climate change is particularly prone to temporal inconsistency because corporate net zero commitments are a fitting arena for “*future washing*”—an inconsistent disclosure practice related to future sustainability commitments (Montgomery et al., 2023). Previous studies in this specific context hint at the possibility of systematic inconsistency, which is temporal rather than cross-sectional. For example, Dahlmann et al. (2019) focus on the effect of different types of GHG goals on subsequent performance. Callery and Perkins (2021) observe some inconsistencies in GHG performance between recent reports coming from the same firm, supporting the overall notion that firms routinely misrepresent such information. Similarly, firms are more likely to shift their goalposts when they anticipate falling short of achieving a GHG emission target (Malen, 2022). Callery and Kim (2025) focus on specific dimensions of GHG emission target changes, such as tradeoffs made between target duration and percentage of reduction sought.

Yet, little prior work specifically assessed the extent to which companies’ disclosures are (in)consistent over time. This research lacuna is even more surprising when observing how conspicuous temporal consistency is to the GHG protocol, a leading standard since its early 2000s initiation (WBCSD & WRI, 2004). Temporal consistency is also an expected standard in sustainability disclosure more generally, as evident by Table 1 (which also includes more contemporary frameworks such as the SBTi and the Corporate Sustainability Reporting Directive [CSRD]). These frameworks have become well diffused in part because of their reliance on familiar accounting terminology and principles (Etzion & Ferraro, 2010). Furthermore, According to Peterson et al. (2015) regulators and accountants have long encouraged temporal consistency in financial reporting, in support of more transparent and informed decision-making by shareholders and other stakeholders.

--- Insert Table 1 here ---

Temporal inconsistency becomes an ethical concern because when commitments are changed without explanation or reference to prior goals, it creates the false impression of comparability across time to stakeholders. For example, suppose a firm made a commitment in 2020 to reduce their GHG emissions by 50% by 2030, but replaced it in 2025 with committing to an 80% reduction by 2040 without informing its stakeholders of the reasons for doing so or referring to the prior goal. The fact that stakeholders were not made aware suggests that the company could potentially keep rolling its target forward time and again. By 2030, stakeholders are unlikely to remember the company’s original commitment, and by 2040, it will have had numerous opportunities to push the target horizon even further into the future thereby violating basic ethical norms (Forester, 1993). In a broader sense, postponing action on climate action constitutes an ethical violation not only towards the company’s direct stakeholders but toward society in general (Besio & Pronzini, 2013).

Importantly, even when such inconsistent sustainability disclosure is *not* deliberate, it can be misleading and unprincipled, because it puts the onus of discovering inconsistencies on stakeholders, thus shifting the balance of information asymmetry even further to the side of corporations (Bowen 2014; Seele & Gatti 2017). Scholars broadly agree that companies are ultimately responsible for how their disclosures come across and that firms have a responsibility to make the information they disclose reliable for stakeholders (Provis, 2010). In line with these premises, we define temporal inconsistency as major changes in sustainability disclosures by the same entity, over two or more time periods, which are unaccounted for in subsequent disclosures. This definition allows us to exclude any properly communicated inconsistencies (e.g., well documented changes to GHG goal setting due to the increasing prominence of soft regulation frameworks such as SBTi or changing internal and external conditions) from our analyses of inconsistent disclosures.

The prevalence of temporal inconsistency

Stakeholders interested in corporate sustainability are exposed to a barrage of information from a variety of first-hand (the company's website, corporate sustainability reports, and press releases) and second-hand (articles, surveys, and consulting reports) sources. Moreover, while voluntary standards have emerged and some jurisdictions have begun to impose sustainability reporting standards, companies have, for the most part been free to decide for themselves how to report on and set goals for sustainability performance (Marquis et al., 2016;)¹. In general, stakeholders struggle to form an accurate picture of what companies are doing on sustainability, often lacking knowledge about the different certifications and standards (Peloza, Loock, Cerruti, & Muyot, 2012). As research in accounting (Bushee et al., 2018) and sustainability (Fabrizio and Kim 2019) shows, as information becomes more complex due to volume and obfuscation (Sinnewe, Yao, & Zaman, 2021), stakeholders have greater difficulty making accurate assessments of companies' positions. Leavy, Li, and Merkley (2011), for example, show that as reporting becomes more complex, analysts must make greater efforts to interpret the information that firms present, rendering their assessment less reliable. Even stakeholders such as rating agencies rarely agree on how to interpret companies' disclosures, leading to vastly different sustainability ratings (Berg et al., 2022; Chatterji, Durand, Levine, & Touboul, 2016).

While prior work has focused on the effort required to interpret information at a given point in time, we argue that these issues become even more pronounced (and likely) when interpreting information across reporting periods, and that the bespoke nature of most sustainability reporting exacerbates the situation. Issuing new corporate sustainability reports is publicly announced (Deloitte, 2025) and implies that older reports are outdated and irrelevant. Since each new report includes information about the past (Phillips, Schrempf-Stirling, & Stutz, 2020), stakeholders are unlikely to notice inconsistent differences

with prior reports or spend time and effort to verify past information. For example, research in financial reporting has shown that information overload is a barrier to financial analysts making accurate evaluations and decisions about companies and investment forecasts (Impink et al., 2021). Similarly, information overload on sustainability can adversely affect investors' decision making (Hafenstein & Bassen, 2016). In short, information overload is likely to be exacerbated when stakeholders need to backtrack over several time periods, and when they are expected to make a judgment about the company's sustainability activities based only on the latest report.

While we argue above that firms *can* readily engage in temporal inconsistency, it does not necessarily mean that they *will*. Here, we contend that two aspects of sustainability reporting in general, and climate goals in particular, make it likely that temporal inconsistency is not only commonplace, but the norm. First, because climate goals are generally long-lasting, the company has many opportunities to adjust their goals and commitments, while also failing to effectively communicate such changes (whether intentionally or not), as external pressure and internal dynamics change. Second, firms have been rewarded for having stringent climate goals, but investors often pay greater attention to the appearance of stringent goals than to their substance (Kim, 2024). Thus, firms have incentives to supplant older goals and obfuscate progress while potentially failing to inform their stakeholders, as original statements are deemed increasingly irrelevant and less readily remembered and retrieved by stakeholders (Mena, Rintamäki, Fleming, & Spicer, 2016). Therefore, we hypothesize:

Hypothesis 1: The majority of corporate GHG emission targets demonstrate temporal inconsistency.

Carbon dependence and temporal inconsistency

¹ The European Union has announced the European Sustainability Reporting Standards (ESRS) but these are still being developed

and refined as of 2025 (KPMG). <https://kpmg.com/xx/en/our-insights/ifrg/2025/esrs-eu-omnibus.html>

The quality of corporate sustainability disclosure is affected by multiple factors including who leads the company and how new they are in their role (Lewis, Walls, & Dowell, 2014), environmental performance (Fabrizio & Kim, 2019), and the level of regulatory scrutiny (Doshi et al., 2013). In addition, the type of business that the company engages in is important. For example, companies in sectors such as mining, utilities, and energy have business models that are heavily *carbon dependent*, which dramatically affects their ability to reduce their GHG emissions over time (Kim, Fairclough, & Dibrell, 2017; Pinkse & Busch, 2013). Companies in these sectors therefore experience tensions (Slawinski & Bansal, 2015) between profit-making and sustainability (Thornton & Ocasio, 1999). On the one hand, they are legally bound to generate profits for their shareholders. On the other hand, they are subject to relatively stronger institutional pressures around their sustainability conduct (DiMaggio & Powell, 1983) as poorly performing firms face greater pressures from stakeholders (Chatterji & Toffel, 2010). These tensions make decoupling of actions from communicated impressions more likely (Oliver, 1991).

Indeed, Levy and Egan (2003) argue that organizations in carbon-intensive industries take an adversarial approach to emissions reduction. For example, sustainability disclosure in the energy sector is fraught with “increasingly opaque information *over time*, concealing information on the measurement and methodology used” (Talbot & Boiral, 2018: 370), and Europe’s five largest oil and gas companies’ reports regularly unveil unexplained figures and methodological inconsistencies (Dragomir, 2012). Similarly, U.S. firms like Exxon and Chevron engage in various forms of corporate hypocrisy (Cho, Laine, Roberts, & Rodrigue, 2018). Given carbon-dependent companies’ propensity to face a great deal of institutional and competitive pressure to perform on climate change, we predict they are also more likely to engage in *temporal* inconsistency. Durand, Hawn, and Ioannou (2019), for example, show that symbolic compliance is prevalent in carbon intensive industries, even though climate change has high issue salience, because of the costs involved. Therefore:

Hypothesis 2: Companies from more carbon dependent sectors are more likely to demonstrate temporal inconsistency of their GHG emission targets.

Temporal inconsistency and subsequent target achievement

In H1 and H2 we focus on the prevalence of temporal inconsistency, arguing that firms are more likely than not to engage in this practice and that greater carbon dependence exacerbates this tendency. We now turn to the consequences of this inconsistency. If inconsistency has negligible impact on the likelihood that a firm ultimately meets its climate goals, then it has only relatively diminished ethical considerations. If, however, inconsistency is associated with failure to meet climate goals, then the goals provide stakeholders with an incorrect assessment of the firm’s intentions and the risks it faces with respect to climate change.

We argue that inconsistency is likely to be associated with failure to achieve climate goals, for both internal and external reasons. External stakeholders react to initial goals and disclosures, granting legitimacy to the firms for the goals they set (Deegan, 2002). Moreover, the ratings themselves appear to be more influenced by disclosure than actual performance (Raghunandan & Rajgopal, 2022; Larcker, Pomorski, Tayan, & Watts, 2022). The very act of disclosing initial goals can itself benefit the firm, creating less imperative to continue to work toward accomplishing the goal it publicized. This is exacerbated by the effort required by stakeholders to assess any inconsistency in the firm’s goals, thus reducing the pressure that they can exert as the goals themselves change.

This external effect is complemented by reducing the ability of *internal* stakeholders to track performance toward the initially-declared goal. That is, the more the firm engages in temporal inconsistency, the less likely it is to hold itself accountable to any specific environmental standards because doing so requires continuous intentionality, coordination, and diligence. Thus, temporal inconsistency stands in the way of the firm’s completion of its targets (Foroughi, Coraiola, Rintamäki, Mena, & Foster, 2020; Morales-Raya & Muñoz, 2024).

Hypothesis 3: Temporal inconsistency of GHG emission targets is negatively associated with successful achievement of the stated GHG emission targets.

METHODS

Sample and Coding

We analyzed the GHG emission reduction targets of 105 firms listed uninterruptedly in the S&P500 index from 2010-2021. We chose this period because, per our preliminary analyses, relatively few companies set GHG emission targets before 2010. Since carbon dependence plays a significant role in the ensuing patterns of GHG target setting (Dahlmann et al., 2019; Pinkse & Busch, 2013), we centered our analysis on six sectors representing three categories of carbon dependence that together comprise at least 35% of the S&P500 market capital (Arnold & Toledano, 2021). Based on breakdowns of global emissions by economic sector (S&P Global Ratings, 2024), Consumer Staples and Discretionary (38 companies) represent relatively low carbon dependence, Industrials and Materials (42 companies) represent mid-range dependence, while Energy and Utilities (25 companies) represent high carbon dependence (Megura & Gunderson, 2022). We also experimented with an alternative classifications, as described following our main results.

Our initial sample included 1,157 standalone sustainability reports from 2010-2021 for these 105 companies from Corporate Register. Although GHG target information is available elsewhere (e.g., Fabrizio and Kim [2019] and others use CDP), our preliminary analysis revealed that standalone reports mentioned considerably more focal-year and historical GHG targets in support of a temporal analysis than other sources. In addition, the standalone reports provided us access to both text (e.g., explanations for the changes between disclosures) and visuals (e.g., bar charts and other graphic objects) to enrich our analysis. For these reasons, we excluded a small number (12) of disclosures in Integrated Reports (IR) and GHG sections of financial reports from further analysis.

We used content analysis coding (Duriau, Reger, & Pfarrer, 2007) for our investigations. First, we coded each target-year (statement)

separately. Then, we associated each target-year with its overarching targets. Finally, we composed a qualitative, textual narrative for each target, to track how it unfolded over time.

Target-year coding. The coding process took place between late 2021 and mid-2022. The first author led a team of three Research Assistants, guided by a written protocol, assisting them as required and ensuring quality control. Each coder was allocated companies in either low, medium, or high carbon dependence sectors, respectively. Next, coders thoroughly scanned the reports for GHG emissions reduction statements (target-years). Each statement was coded according to eight criteria for our purposes. For example, if a statement read: “As of 2010, we commit to reducing CO₂ emissions per dollar revenue (Scope 1+2) in our local facilities by 10% compared to 2005, and to do so by 2020”, we coded the following:

(1) *Coverage.* The range of GHG emissions to be reduced, e.g., CO₂, CH₄ (Methane), or all GHGs. In the example above, only CO₂ is covered.

(2) *Type (Absolute/Intensity).* An *absolute* statement involves a non-ratio measure, e.g., a 10% reduction of net emissions, as in the example above. In contrast, an *intensity* statement is based on a ratio, e.g., 10% per annual dollar revenue.

(3) *Set year.* The year the target was established (2010, in our example).

(4) *Duration.* We calculated the spread between the set year and target expiry (the end year, i.e., 10 years between 2010 and 2020, in our example). Some target-years also mentioned a baseline against which performance is measured (2005, in our example). However, we did not code this parameter systematically, as it was frequently missing.

(5) *The level of commitment per year.* We only coded statements that included a numerical figure, per year of target duration. In the above example, this is 10% over 10 years, i.e., 1% per year. We also coded non-percentage commitments, e.g., “to reach 60 million metric tonnes (MMT) of CO₂ emissions per year” or “to reduce emissions by 10 MMT per year”.

(6) *Scope.* Most target-years mentioned an exact scope under the GHG protocol (2004).

Scope 1 pertains to emissions from direct operations such as fuel combustion; *Scope 2* pertains to the emissions from the firm's electricity consumption; *Scope 3* pertains to emissions from indirect sources such as supplier and customer operations (upstream and downstream, respectively). When an exact scope was missing, we assumed that terms such as "local facilities" (in the example above) and "operations" meant scopes 1 & 2, while "upstream," "supply chain," "downstream," and "customers" pertained to scope 3.

(7) *Science-Based Targets Initiative (SBTi)*. We coded whether the target was explicitly set in commitment to the SBTi, merely mentioned the SBTi, or did not mention it at all. In the example above, SBTi is not mentioned.

(8) *GRI*. We coded whether the target originated in a Global Reporting Initiative (GRI)-certified report –the most common format for standalone sustainability disclosures, at least during the period of interest (Etzion et al., 2017).

By the end of this stage, our data consisted of 882 coded target-years along these eight elements.

Overarching target coding. Target-years ideally repeat themselves from one period to the next as they refer to the same overarching targets. For example, the statement above was declared in 2010, so with temporal consistency we would expect to find an equivalent target-year (alongside an updated performance figure) in each of the subsequent ten reports leading up to 2020. We marked target-years as referring to the same overarching target if their essential elements repeated (coverage, type of measure, the level of commitment, scope, and time frame). We coded the target-years as a new target when they clearly departed from original targets, such as a change in the coverage from CO₂ to Methane, a switch from intensity to absolute targets, or a shift from scope 1 & 2 to scope 3. We also coded them as a new target if the commitment and/or the time frame was extended (or reduced) by at least 10% or ten years. In cases of target-years belonging to the same target but having information that was only slightly altered (e.g., if SBT was not mentioned at first but adopted later, or if commitment was changed immaterially), we used

the earlier version when coding the overarching target. This provided a more conservative account of inconsistency, as we do not penalize firms for immaterial changes in goals and reporting. Through this process, we identified repetition between subsequent target-years, allowing us to extract a smaller database of 372 overarching targets.

Temporal Inconsistency coding. We coded each overarching target as either consistent or inconsistent. We coded the target as inconsistent when jointly meeting the following two conditions: a) the target underwent a meaningful change *before* its purported expiry (as described above) or was dropped altogether from subsequent disclosure; and b) the accompanying section in the report did not account for this change. If either of these conditions did not apply, we coded the original target as consistent. Figure 1 showcases the target setting of three different cases and the corresponding coding, including a detailed explanation. In 2010, all three companies set out with identical targets (TA-1, TB-1, TC-1, respectively), to reduce GHG by 10% by 2020. Company A repeatedly restated the same target and followed it through until completion. In this case, we code the overarching target ("TA-1") as temporally consistent. Company B shifted its target upward in 2018 (before its intended expiry), to reducing 50% by 2030 (TB-2), but failed to provide any further account of the original target (TB-1). While this action may seem to increase the company's commitment to improvement, changing the goal without providing further reference to the previous target obscures the degree of progress it has made. In principle, it could continue to 'cascade' goals in this way and make it difficult to assess progress over time. In this case we therefore code the original target (TB-1) as temporally inconsistent. The status of the new target (TB-2) is yet to be determined as of 2021 (when we started the coding process). Company C repeatedly restated its target (TC-1) up until 2018, at which point it was disbanded without further notice. In this case, we code the target as temporally inconsistent.

--- Insert Figure 1 here---

Achievement coding. The coders also noted whether and when the original targets were met.

If the targets were explicitly announced as achieved or failed, coders marked target status accordingly. If the targets were not explicitly announced as achieved or failed, coders searched the report referencing the initially stated expiry date for corresponding performance data. For example, if the 2010 target cited in our earlier statement was dropped at any point before its intended 2020 expiry, the coders searched the 2020 report for a performance figure. If the 2020 figure still indicated at least a 10% reduction (in line with the original target), they marked this target as “achieved”, even if the target disappeared from reports at some point. If coders could not find corresponding information, they noted the target as “failed.” Targets that were still underway at the time of our coding (i.e., targets whose achievement status could not be determined), were eliminated from our sample. From this process, our sample reduced from 372 to 211 targets (and 76 out of the original 105 companies) for which we could discern target completion. The final sample included 52 targets from 26 low carbon dependence companies, 69 targets from 29 medium carbon dependence companies, and 90 targets from 21 high carbon dependence companies, respectively (Table 2).

--- Insert Table 2 here ---

Composing a narrative for each target. Finally, the coders generated a single passage narrative for each overarching target, focusing on consistency and achievement issues. For example, one of the coders wrote: “Target T1, announced in 2010, to reach 10% total GHG emission reduction by 2020 (compared to a 2005 baseline), was followed through consistently (except in 2016 when there was no report) until its last mentioning in 2019. In 2020, it was replaced by target T2: to reach a 50% reduction by 2030. The company achieved its original commitment (10% reduction) in 2021 but did not report it in the context of the original target.” These narratives allowed us to discern different patterns of temporal inconsistency, described later. We discussed the narratives among all

coders and reiterated the process until a consensus was reached.

Regression Analyses

We employed logistic regression analyses to test hypotheses #2 and #3 (to test H1 we constructed a confidence interval around the observed proportion of inconsistent targets).

Dependent Variables. We used our Inconsistency code (binary, where 1 is “inconsistent”) as a measure of temporal consistency (for H2). As a reminder, we only code a target as inconsistent if it is either dropped from subsequent disclosure prior to expiry or it is changed materially as described above *and* the company makes no reference to the change. We used our target Achievement code (binary, where 1 is “achieved”) for H3.²

Independent Variables. We used the company’s S&P500 sector affiliation as our proxy for the Level of Carbon Dependence (H2).³ As noted above, we classified Consumer Staples and Discretionary as low dependence (the omitted category in our models), Industrials and Materials as medium dependence, and Energy and Utilities as high dependence (Megura & Gunderson, 2022). Our target Inconsistency indicator formed the independent variable for H3’s analysis of the probability of target achievement.

Control Variables. We controlled for the eight target elements described earlier: Target Coverage (e.g., GHG or otherwise), Type (absolute/intensity), Set Year, Duration, Commitment (per year), Scope (1/2/3), SBTi commitment, and GRI status. We also controlled for a host of additional firm-related variables, as follows.

First, we included variables that reflected business-related factors that might affect target inconsistency and achievement. We followed prior research on sustainability governance and disclosure (e.g., Walls, Berrone, & Phan, 2012) to control for: Return on Assets (ROA), Size (log assets), Sales Growth, Leverage (debt over assets), Capital Expenditures Intensity (CAPEX over sales), Research and Development Intensity

² We experimented with alternative modes of operationalizing temporal inconsistency and target achievement and find results consistent with the initial coding, as discussed after our main findings.

³ We also performed robustness tests where we reclassify several firms from one level of dependency to another based upon a different measure of carbon dependency. We discuss these tests following our main results.

(R&D expenses over sales), and Advertising Intensity (advertising expenses over sales). We obtained these data from Compustat. Because our unit of analysis is the overarching target rather than target-year, the matching of yearly financial data to targets was not straightforward. We populated each target's financial parameters with the average of the yearly financial values over that target's period. Additionally, for H3 we included the firm's Level of Carbon Dependence as we anticipate that more carbon-dependent firms might have greater difficulty achieving reduction goals.

In addition to financial metrics, we controlled for internal and external contextual factors that might influence target setting and achievement.⁴ First, we recognize that a change in top management priorities might influence target setting. Thus, we used the BoardEx database (Lewis et al., 2014) to extract the number of CEO turnovers (labeling this *CEO Changes*) between 2000-2018 for each of the companies in our sample, over the life span of their respective targets. To complement this dataset for the additional period of 2019-2021, we guided ChatGPT to collect this information from publicly available sources (OpenAI, 2025). Second, we assigned a value of 1 to a dummy variable (*Paris Agreement Withdrawal*) denoting the time period when the U.S. government withdrew from the Paris Agreement (2016-2020, included), to capture the regulatory environment around climate change shifted during this period, potentially increasing firms' tendencies to abandon or relax goals.

Analytical techniques. All analyses were performed using R Statistical Software (v4.5.1; R Core Team 2024) We ran pairwise comparisons to support our regression analyses. We applied a standard logistic regression model (logit link function) based on log odds ratio of the dependent variable at the target level (T):

$$\log P(y_T)/(1 - P(y_T)) = IV_T + \Sigma X_T$$

Where y_T denotes the dependent variable (temporal inconsistency and target achievement for H2 and H3, respectively), IV_T is the

independent variable (carbon dependence and temporal inconsistency for H2 and H3, respectively), and ΣX_T denotes a set of control variables.

We opted for this model rather than a panel data analysis because our unit of analysis was an overarching target rather than a target-year. This means we did not control for firm-fixed-effects and year-fixed-effects. Instead, we controlled for the sector carbon dependence (an ordinal variable) and for the target set year and duration, both of which were continuous variables (Davidson & MacKinnon, 1993). For some of the robustness tests (i.e., when replacing a binary variable with a continuous variable) we used a standard Ordinary Least Squares (OLS) linear regression instead of a logistic model.

Missing data. Three covariates had ten or more observations with missing data: scope, R&D, and advertising expenses. Since scope was a vital control variable (Dahlmann et al., 2019), we assigned a distinct measure ("unavailable") for this variable and included it in our regression. For missing R&D and advertising expenses, we plugged in zero values, assuming these would have been reported if they had been material expenses. We added a dummy (for each R&D Intensity and Advertising Intensity) to indicate when these were based on imputed values. At the end of this process, 20 observations were still missing one or a few target parameters and 15 observations were missing some financial controls. We kept these observations (N=211) for the purpose of calculating descriptive statistics and non-parametric comparisons of target achievement but excluded them from the regression analyses. Our final regression sample thus included 176 out of 211 overarching (expired) targets.

FINDINGS

Descriptive Statistics

Table 3 summarizes the key descriptive statistics. We find that a majority (55%) of the targets engage in temporal inconsistency. At the same time, a majority of targets (55%) are also ultimately achieved (in some cases, companies managed to achieve targets despite failing to

⁴ We thank our anonymous reviewers for suggesting these variables

disclose them in a consistent manner). The mean target duration in our sample is just above ten years, with a median of 8.5 years. The mean GHG reduction commitment per year is 3.7%, with a median of 2.8%. Most (53%) of the targets are for absolute GHG emission reductions. The vast majority (74.8%) do not mention an explicit scope, followed by targets pertaining to scopes 1 & 2 (20.8%) and other combinations. A majority of targets (58%) refer to all GHGs or CO₂e. Most targets do not commit to the SBTi (79.6%) and occur in non-GRI reports (69.1%).

--- Insert Table 3 here ---

Table 4 provides Pearson correlations. Temporal inconsistency and target achievement are negatively correlated ($r=-0.562$), lending initial insights for H3. Target achievement is negatively correlated with target duration, suggesting that shorter targets are more likely to be achieved. Temporal inconsistency is also positively correlated with duration, suggesting that the more distant the target, the more likely it will be adjusted. Turnover of CEOs is negatively correlated with both target achievement and inconsistency.

--- Insert Table 4 here ---

The Prevalence of Temporal Inconsistency (H1)

We conduct a one-sided Z-test⁵ for whether the proportion in our sample is higher than 50%. The resulting p -value is 0.09, suggesting marginal statistical significance (at a 10% threshold). Equivalently, a 10% Confidence Interval for our estimate lies between 48.7% and 62.2%, lending marginal support to the hypothesis that a majority of the targets undergo temporal inconsistency.⁶

Carbon Dependence and Temporal Inconsistency (H2)

High carbon dependence companies generally set more targets than companies in other sectors

(Table 2). High carbon dependence companies are responsible for an average of 4.28 targets per company, compared to 2.38 targets per company for medium carbon dependence companies and only 2.00 per company for low carbon dependence companies. Pairwise comparisons confirm a significant difference between the low and high carbon dependence categories ($p=0.00$) and between the medium and high carbon dependence ($p=0.01$) but not between the low and medium carbon dependence companies ($p=0.19$).

Furthermore, the likelihood of temporal inconsistency for a given target is highest in high carbon dependence sectors (74%), compared to 48% and 35% for the medium and low carbon dependence sectors, respectively. Pairwise comparisons confirm a significant difference between the low and high carbon dependence ($p=0.00$) and between the medium and high carbon dependence ($p=0.02$) but not between the low and medium carbon dependence sectors ($p=0.13$). These results provide initial support of H2, implying that most of the temporal inconsistency in our sample takes place in high carbon dependence sectors, i.e., Energy and Utilities, as these have both the highest number of targets per company and the highest rates of temporal inconsistency per target.

Model 1 in Table 5 includes only control variables (the baseline model). Model 2 adds indicators for the medium and high carbon dependence sectors, thus making low dependence the baseline case. A one-sided test⁷ reveals that all else being equal, high carbon dependence is significantly and positively associated with temporal inconsistency ($\beta=2.03$, $p=0.04$). Medium carbon dependence is also positively associated with temporal inconsistency ($\beta=1.54$, $p=0.03$). Thus, our regression analyses further corroborate the notion that higher levels of carbon dependence predict temporal inconsistency.

A few control variables are statistically relevant for temporal inconsistency: the set year, target duration, and commitment per year all have positive and strongly significant effects. The set year association might be relevant because many

⁵ A common heuristic suggests that if the product of the sample size (n) and the population proportion (p) is higher than 5, one can rely on the Central Limit Theorem (CLT) and perform a Z-test rather than a t-test.

⁶ We discuss our decision to set the null at 50% in the limitations section.

⁷ All tables report the results of a two-sided test. The p -value of a one-sided test is calculated as half of the two-sided test's p -value, provided the z-statistic has the expected sign.

targets from the high carbon dependence group (i.e., targets that were likely temporal inconsistent) were also set relatively later. Indeed, the Cramer's V correlation between the set year and carbon dependence is relatively high ($r=0.36$). The finding for duration could be explained by the fact that more extended targets are statistically more prone to temporal inconsistency than short-term targets. In terms of commitment per year, the positive correlation is also expected, as more ambitious targets are overall harder to pursue over time. Finally, targets from GRI-certified reports (but not SBTi) are less likely to engage in temporal inconsistency.⁸

Robustness tests. We tested the sensitivity of our findings by tweaking our ordinal measure of carbon dependence. First, we reallocated 11 companies from medium to high carbon dependence because they represented the materials sector, in which the level of GHG emissions is high (Global S&P Ratings, 2024). The results remain unchanged. We also replaced our ordinal carbon dependence scale with a continuous measure of the company's scope 1 GHG emissions at the target onset (i.e., prior to inconsistency), which is a common way to measure carbon dependence (Dahlman et al., 2019). We focused on scope 1 because scope 2 and especially scope 3 are less consistently and accurately reported (Nguyen, Diaz-Rainey, Kitto, McNeil, Pittman, & Zhang, 2023). The positive correlation between carbon dependence and temporal inconsistency remains robust ($\beta=0.37$, $p=0.02$). Finally, we performed additional analyses using both more expansive and restrictive definitions of target inconsistency. In our main results, we consider targets to be inconsistent only if they were dropped from subsequent disclosure without further notice ('disbanded') or if the goals were altered by a material amount without explanation ('goalpost shifted'). In the more expansive definition, we included two other forms of inconsistency: hindsight target setting and number fudging (we describe these in more detail below). This expansive definition of temporal inconsistency (based on all four patterns) strengthens the results: coefficients for high and medium carbon

dependence increase to $\beta_{\text{High}}=4.85$ ($p=0.00$) and $\beta_{\text{Low}}=3.02$ ($p=0.00$), respectively. We also used a narrower definition of inconsistency by coding only those targets that were disbanded as inconsistent. Using this definition did not yield significant results, because of the reduction in sample size (hence in statistical power). However, the hypothesized trend is still evident in the descriptive findings (see, e.g., Table 8, which we discuss below). Overall, our robustness tests provide at least partial support to the notion that carbon dependence predicts temporal inconsistency (H2).

--- Insert Table 5 here ---

Temporal Inconsistency and Target Achievement (H3)

Consistent targets in our sample are substantially more likely to be completed (86%) than temporally inconsistent targets (30%). A statistical test for proportion equality reveals a significant difference between the two groups ($p=0.00$). This finding lends preliminary support for H3. We recognize that this could reflect that companies disband or change targets that are not on a path to successful completion; in other words, we do not claim that inconsistency is causing incompletion. Merely, we find that firms modify or outright disband targets that they had introduced without giving stakeholders adequate disclosure of the changes, while also failing to meet the original targets.

In our regression analyses, Model 3 in Table 6 includes only control variables and Model 4 adds the main effect. We note a significant negative association between target inconsistency (Model 4 in Table 6) and the likelihood of target achievement ($\beta=-3.38$, $p=0.00$), as hypothesized. We also note some interesting effects of control variables. Targets covering all GHGs are associated with a lower probability of being achieved than those covering a specific segment such as CO₂. Absolute targets are associated with a higher likelihood of achievement than intensity targets. In addition, longer target durations are associated with a lower likelihood of achieving targets, similar to our earlier findings.

⁸ We caution that this is not necessarily evidence for greater effectiveness of GRI-certification, as SBTi came into effect much

later than GRI, which may explain the differences in statistical association.

Furthermore, while advertising intensity is negatively associated with target achievement, the advertising imputation indicator is also negative, suggesting that our imputation procedure introduced a bias. However, our results for temporal inconsistency remain robust when removing the advertising covariate from the model.

Robustness tests: Using an expansive definition to pertain to all forms of temporal inconsistency weakens its negative association with target achievement, but the coefficient remains strongly significant ($\beta = -1.79$, $p = 0.00$). Similarly, using a restrictive definition of temporal inconsistency to pertain only to disbanded targets, weakens its negative association with target achievement, but the coefficient remains strongly significant ($\beta = -1.55$, $p = 0.00$). Replacing our proxy for target achievement with GHG scope 1 emissions at the target's expiry reverses the hypothesis' direction (from a negative to positive correlation with inconsistency). Performing this one-sided test indeed results in a positive correlation ($\beta = 0.32$, $p = 0.07$) which is statistically significant at a 10% threshold. Overall, the robustness tests provide further confirmation to our hypothesis that temporal inconsistency is negatively associated with target achievement (H3).

--- Insert Table 6 here ---

QUALITATIVE FINDINGS: TEMPORAL INCONSISTENCY PATTERNS

By iterating between the raw data and the codes, as well as comparing and discussing the coders' summaries, we identify four temporal inconsistency patterns that emerged across the sample which we labeled as hindsight target setting, goalpost shifting, number fudging, and target disbanding. While our coding also hints at other patterns, these four were frequent (at least 10 occurrences each), suggesting they are the most common ways by which GHG emission targets change over time. Table 7 presents these patterns by prevalence and by their decreasing order of associated target achievement rate: hindsight target setting is associated with the highest target achievement rates (by definition, as we discuss below), while target disbanding has the lowest achievement rates. These patterns are

mutually exclusive, except for number fudging (i.e., some targets simultaneously demonstrate number fudging in addition to one other pattern). Importantly, as our findings are based on content analysis, we refrain from implying that companies are intentionally greenwashing (see discussion). Instead, we exemplify how the occurrence of each pattern can be misleading and, ultimately, violate ethical principles of good corporate governance.

--- Insert Table 7 here ---

In addition to findings pertaining to the level of the target and the sector, Table 8 presents findings at the company level, per carbon dependence sector (rows) and per type of temporal inconsistency (columns). The chances of a high carbon dependence company to engage in temporal inconsistency (i.e., that at least one of its targets is inconsistent) are highest across the board. For example, 19 out of 21 high carbon dependent companies (more than 90%) are engaged in target disbanding, compared to 18 out of 29 medium carbon dependent companies (62%) and only 7 out of 26 low carbon dependence companies (less than 27%).

--- Insert Table 8 here ---

Hindsight Target Setting

We find 26 targets that are declared and achieved simultaneously (in the same year), suggesting they were set in hindsight, that is, in light of current performance levels (Figure 2). We also find that 37 targets are achieved within one to three years of being established. The mean commitment of these targets was 22.2%, compared to 26.3% for the entire sample. Although hindsight target setting is associated with a 100% achievement rate (by definition, see Table 7), we see this pattern as violating ethical principles because stakeholders typically were not informed about the target (or were informed for only one or two years) before it was achieved, a form of obfuscation. Thus, whether deliberate or not, hindsight target setting enabled the company to use the fact that the average reader is only exposed to a snapshot to make it seem like the firm had "achieved" a target supposedly (but not actually or only recently) set in the past.

In Figure 2's top three panels, Company A is steadily approaching (and eventually reaching) a preannounced carbon emission threshold. In the bottom three panels, Company B did not have a preconceived threshold until 2017 (bottom right panel), when its performance just barely surpassed its recently announced goal threshold (3.73 and 3.75, respectively). This nearly perfect concordance implies the target was declared in hindsight to match performance, rather than the other way around.

--- Insert Figure 2---

Goalpost Shifting

We find evidence of target goalpost shifting in 41 targets —occasions where firms modify their aspirations for emission reductions without proper disclosure (Figure 3). We build upon prior work (Malen, 2022) that subsumed several practices into the term goalpost shifting by isolating situations where targets were significantly altered.

In Figure 3's top three panels, Company A is steadily approaching its 2020 carbon emission reduction target of reducing emissions by 60% from a 2009 baseline. In the bottom three panels, Company B is approaching the same target, but in the bottom right panel (2020), the target has shifted from 60% to 75%, prior to either expiry or success and without transparency. Since the shift occurs without any explanation or reference to the prior goal, it causes significant difficulty for stakeholders attempting to track the firm's progress.

Fewer than half of these targets (44%, Table 7) are eventually achieved. We find goalpost shifting more likely to occur closer to target expiry, which could come across as an intentional effort on the part of the company to rewrite its target setting narrative instead of admitting an upcoming failure.

--- Insert Figure 3---

Number Fudging

We find 13 inconsistencies between performance figures relating to the same target across time or identical statistics relating to (supposedly) different targets, which might suggest that the numbers were “fudged” (Figure

4). While such inconsistencies might be attributed to human error, the fact that they typically overstate the firm's performance means they violate ethical principles of good disclosure practices. Overall, number fudging means data reliability is low, because it implies cherry-picking, a form of selective disclosure (Marquis et al., 2016). Some of the inconsistencies we unravel imply, at a minimum, a severe recurring error, thus undermining readers' trust and subverting the viability of meaningful temporal comparison. Number fudging is also associated with a relatively low rate of target achievement (38%, Table 7).

In Figure 4's top three panels, Company A's performance figures corresponding to any given year are identical (for example, all of the red columns pertaining to 2018 mention the same figure – 2.94), suggesting that temporal consistency is maintained. In contrast, in the bottom three panels, Company B's performance figures corresponding to any given year keep changing (for example, the red column figures pertaining to 2018 change from 2.94 in 2018– to 2.95 in 2019 – then to 3.00 in 2020).

--- Insert Figure 4---

Target Disbanding

Lastly, we find 81 instances of targets that were dropped from reporting, after the initial disclosure, while underway (Figure 5) and without any corresponding notification. We argue that this pattern represents the most severe (ethical) gap between corporate communication and practice. Whether intentional or not, disbanding allows the company to restart its narrative from scratch. Target disbanding typically involves an abrupt switching of calculations, e.g., from an intensity-based target (Figure 5 bottom middle panel) to an absolute target (bottom right). Under these circumstances it becomes practically impossible to verify the consistency and achievement status of previous targets, as doing so involves the conversion and recalculation of performance figures representing different time points. According to our analysis, just over a fifth of the disbanded targets (23%, Table 7) are nevertheless reached by their expiry date (without being reported as such). In these cases, even though the companies are making

overall steady progress on the original trajectory, they prefer not to showcase other efforts. Overall, it seems difficult for a company to get back on track once a target has been disbanded.

In Figure 5's top three panels, Company A is steadily approaching its 2020 goal of emitting 0.16 tons CO₂e per ton of food produced, which it eventually admits having failed to achieve on time. In the bottom three panels, Company B is approaching the same goal, but in the bottom right panel (2020) the target is disbanded in favor of an entirely new target: to reach 610-ton CO₂e by 2025, thus also reflecting a switch of calculation methods.

--- Insert Figure 5 ---

DISCUSSION

Inter-report consistency, also sometimes referred to as comparability or stability, is a central accounting principle (Peterson et al., 2015), and is critical in sustainability disclosure (WBCSD & WRI, 2004). Consistency fosters the implementation of other essential accounting principles, such as transparency, clarity and materiality. When companies fail to maintain the same base of calculations across reports and are not transparent about changes made in reporting, they violate both ethical standards and 'good corporate governance' practices (Aguilera et al, 2025; Forester, 1993). Our study reveals that most target disclosures (55%) fail to adhere to the principle of consistency, as changes in (long-term) promises about GHG targets are not properly disclosed. In other words, we find that temporal inconsistency is the norm rather than the exception, at least among large U.S. companies in our sample. These firms may appear to be pursuing substantive action on climate change by conveying the message that they have either recently achieved a long-sought-after target or that they are about to do so. However, when following their disclosure over time, we observe a very different pattern that includes a significant degree of obfuscation and symbolic action, demonstrating that a temporal lens is necessary when evaluating sustainability reports. Our findings show that rather than a "smooth sail" towards a single, long-term destination, GHG target setting is often a journey fraught with tumultuous seas.

We find marginal evidence that inconsistent GHG target setting is more prevalent in companies operating in high and moderate carbon dependence. This finding is especially troublesome when combined with our results showing a significant association between inconsistent GHG targets and failure to achieve those targets. The likelihood of achieving a consistent target is 86%, almost three times as high as an inconsistent target (30%). In other words, we find that it is precisely in those sectors where meaningful climate mitigation is needed that firms fail to keep GHG promises. Thus, while these companies experience the highest levels of stakeholder pressure (at least in its regulatory and normative forms, e.g., Ambrose, 2021), they also seem to most frequently decouple GHG promises/targets from practices.

We also identify four patterns of temporal inconsistency: hindsight target setting, goalpost shifting, number fudging, and target disbanding. Hindsight target setting means companies claim to have achieved their target only after the fact, making them appear successful in addressing climate change, whereas in reality they are simply making a claim about success without being clear and transparent about their (historic) promises. Goalpost shifting means companies set new targets, that may seem 'better' in a static snapshot (e.g. a larger percentage reduction) but often translate to a slower pace of progress towards climate mitigation than the original target (Callery and Kim, 2025), again, while neglecting the expected provision of a transparent account. Number fudging is not specific to target setting but could involve any inconsistent change in the way progress on a sustainability dimension is tracked and disclosed over time. Finally, disbanding previous targets without proper disclosure is perhaps the bluntest manifestation of temporal inconsistency, as it allows a company to overhaul its narrative from one period to the next. In line with others (Bowen, 2014; Lyon & Montgomery, 2015; Seele & Gatti, 2017) we argue that such practices violate ethical principles of good corporate governance due to their misleading potential, regardless of whether they involve any deliberate action. Ultimately, companies are responsible for the impression they generate of their targets and actions through disclosures, regardless of their original intent.

We discuss several potential reasons for our findings. On the one hand, companies that have the most to gain from the continued use of fossil fuels are presumably also the most resistant to changing their business model. While the market share for fossil fuel alternatives is growing, these have been relatively scant until recently. A less cynical view might be that companies with large GHG emissions also struggle to mitigate their emissions, suggesting that “the contradicting elements and expectations within their social and institutional environment may practically force (these) organizations to resort to hypocrisy” (Cho et al., 2015, p. 91).

We acknowledge the possibility of reverse causality between inconsistency and target achievement: rather than inconsistency leading to reduced performance, it could be that companies decide to change targets once they realize they are not on track. This, of course, is also problematic and fraught with ethical concerns; stakeholders evaluate companies based upon goals they set, so shifting those goals because they have become difficult to meet is a breach of a promise between the company and its stakeholders. An approach that some firms use to manage this conundrum is through greenhushing/silent greening, where companies take sustainability action but are cautious about communicating their goals (Delmas & Burbano, 2011). However, silent green approaches typically constitute a lack of transparency and are often found in industries that suffer from strong stakeholder skepticism (Boiral, Brotherton, Talbot, & Guillaumie, 2025), and as such still violate principles of ethics and good corporate governance.

Theoretical Contribution

Recent studies have analyzed changes in disclosure, e.g., from one year to the next (Callery & Perkins, 2021) or prior to target expiry (Malen, 2022). Our study is the first to expose the dynamic nature of sustainability disclosure over the entire length of a firm’s goals. Unlike with standard, cross-sectional studies on consistency of sustainability disclosure, the patterns we find are undetectable at the snapshot (static) level. To reveal them, scholars (and other stakeholders) must evaluate corporate reports over time, search for the target-year statements, and carefully compare them. Thus, beyond discovering more

inconsistency techniques, our findings exemplify how decoupling of sustainability reporting occurs over time, thereby introducing a temporal dimension to the sustainability disclosure literature. By taking a temporal, future-oriented perspective scholars can also more easily study desirable futures (on topics such as climate change) and conduct impactful research (Gümüşay & Reinecke, 2024).

Importantly, our findings have implications for contexts outside of GHG target setting; similar issues are likely to be found in other forms of sustainability disclosure. We focused on a context where companies are expected to provide “hard” numbers, such as their GHG emission reduction commitment and the time frame to pursue it. Other domains of sustainability disclosure, such as the company’s social responsibility, involve the provision of largely qualitative information. With the absence of objective numerical targets, temporal inconsistency is even harder to define and identify, providing more room for what might be seen as opportunistic obfuscation in corporate reporting. As such, our study of temporal dynamics enriches the understanding of corporate ‘walk-talk’ discrepancies, reflected in calls for such perspectives among management (Ancona, Okhuysen, & Perlow, 2001; Blagoev, Hernes, Kunisch, & Schultz, 2024; Kaplan & Orlikowski, 2013) and sustainability scholars (e.g., Bansal, Kim, & Wood, 2018; Slawinski, Pinkse, Busch, & Banerjee, 2017).

More broadly, our findings build on existing typologies of strategic responses to institutional pressures. For example, Oliver (1991, p. 154) observed that organizations use concealment strategies by “disguising” nonconformity behind a façade of “acquiescence.” She outlined the kind of ‘window dressing’ approaches that organizations use so that observers cannot discern the degree to which the organization has complied with institutional demands. In our case, firms appear to yield to increasing institutional pressures to disclose and reduce emissions, at least at the snapshot level. However, when examining disclosure as a temporal process, we find that these firms have concealed their actual compliance. Our work thus lends a temporal perspective of strategic responses to institutional pressures.

Finally, our study makes an empirical contribution to the disclosure literature through the combination of content analysis at the target-year level with a quantitative analysis focusing on *overarching targets* as its unit of analysis. Previous studies (e.g., Callery and Kim, 2025) relied primarily on panel data of target-years, which allows for longitudinal analysis but does not lend itself to an identification of temporal inconsistencies, which can happen at any point over the target's life span. In addition, coding CSR reports and following each target in the sample until it was achieved, abandoned, or altered enabled us to reveal distinct qualitative patterns and trends that would have been otherwise invisible.

Future Research

Our findings suggest avenues for further research across several areas. First, since our measure of temporal inconsistency includes different patterns (e.g., goalpost shifting and target disbanding), there is room to test outcomes for each pattern separately. Furthermore, while we were able to show a general link between inconsistency and failure to achieve targets, additional research could employ a difference-in-differences, matching, or a 2SLS design to determine causality and account for endogeneity.

Other modifications to the model may include adding interaction effects between temporal inconsistency and other target elements and collecting more data to examine the impact of regulatory changes, such as the recent mandatory CSRD and associated standards in the European Union, as well as other external changes. Focusing on the report level could help us shed further light on other interesting findings regarding periods of disclosure stoppage and the institutionalization of reporting over time (Shabana., Buchholtz, & Carroll, 2017).

Finally, additional research could lend more focus to the conditions that foster consistent, rather than inconsistent, disclosure. For example, firms in our low carbon dependence sectors engage in less temporal inconsistency compared to their counterparts in moderate and high carbon dependence sectors. Future research could complement conceptual models that predict compliance with institutional norms and demands (Durand et al., 2019). Moreover, the context of GHG emissions could be used to broaden the

premise of individual goal-setting theory (Locke & Latham, 1990) to the organizational level. In the spirit of performance feedback theory (Cyert & March, 1963), scholars could also explore whether firms are more likely to succeed following a failure or a previous success.

Limitations

We recognize that our study is not devoid of limitations. While evidence of inconsistency may imply decoupling on part of the company, it does not prove that such action is deliberate and could be merely a sign of disorder and neglect. However, as we discuss in early on in our paper, definitions of greenwashing include both deliberate and non-deliberate symbolic actions (e.g. Lyon & Montgomery, 2015). It may be feasible to capture deliberate versus unintentional decoupling, but that would require a different type of study, such as through direct contact/observation of activity within companies, which is beyond the current scope.

With regards to our first hypothesis, we recognize that setting the null at 50% and showing that the majority of targets are temporally inconsistent is somewhat arbitrary. That is, it is unclear whether 50% is the threshold at which temporal inconsistency becomes problematic, and stakeholders might argue that lower proportions of temporal inconsistency are already indicative of disclosure problems. In this sense, using a 50% cutoff is quite conservative.

In our third hypothesis, our outcome variable of target achievement is measured on a binary scale (achieved/failed), which is limiting. For example, committing to a 50% reduction but attaining 40% represents a presumably better performance than setting and achieving a 10% reduction goal. However, the fact that our robustness test points to the same pattern while making use of a continuous measure of target achievement (while controlling for commitment) somewhat alleviates this concern. Furthermore, common method bias might be a concern as we draw on the corporate sustainability reports for both temporal inconsistency and target achievement. However, since these measures typically span across long periods of time and the processes of constructing them are independent of one another, we perceive that common method bias is not a major concern in our analysis.

Another question arises to the generalizability of our study, as we focus on a sample of S&P 500 companies. Since these firms are highly visible to stakeholders (Okhmatovskiy & David, 2012) and are under more scrutiny to disclose and demonstrate legitimacy than smaller companies (Reid & Toffel, 2009), our findings can be interpreted as representing a lower bound for the prevalence of inconsistency.

Finally, the dynamic nature of target setting also means we excluded targets set or resolved after our coding period. For example, companies established more targets once the SBTi guidelines came into effect, but these targets expire beyond the timeline of our study period. With new initiatives such as SBTi and CSRD, patterns of inconsistency may differ. Future work could examine a broader sample with a longer panel of SBTi participation and more completely assess whether there are circumstances when these certifications enhance consistency and/or performance. However, as long as stakeholders have limited bandwidth to exercise sequential reading, temporal inconsistency in sustainability disclosure will likely remain a concern.

CONCLUSION

Corporate sustainability disclosure is an organization's primary means of communicating its engagement with the world's most pressing social and environmental challenges, yet in its current form, it is still heavily contested. Our paper adds to the conversation by pointing to the considerable leeway that organizations have in presenting favorable disclosures of sustainability, so long as these snapshots are not systematically compared over time. Our research may allow stakeholders to detect most cases of temporal inconsistency, via an approach that could be adopted in sustainability evaluation frameworks such as ratings and rankings to assess firms' sustainability performance over time. Our study implies that increasing the stringency around temporality-related issues is necessary to create a world where transparent, truthful, and overall ethical disclosure is the new norm. Overall, the detection of temporal inconsistency is necessary to distinguish sustainability leaders from laggards.

REFERENCES

- Aguilera, R. V., & Ruiz Castillo, M. (2025). Toward an updated corporate governance framework: Fundamentals, disruptions, and future research. *BRQ Business Research Quarterly*, 28(2), 336-348.
- Ambrose, J. (2021). ExxonMobil and Chevron suffer shareholder rebellions over climate. *The Guardian*. Retrieved from <https://www.theguardian.com/business/2021/may/26/exxonmobil-and-chevron-braced-for-showdown-over-climate>
- Ancona, D. G., Okhuysen, G. A., & Perlow, L. A. (2001). Taking time to integrate temporal research. *Academy of Management Review*, 26(4), 512-529.
- Andrews, R. NL., Amaral, D., Darnall, N., Rigling Gallagher, D., Edwards, Jr., D., Hutson, A., D'Amora, C., & Zhang, Y. (2003). *Environmental Management Systems: Do They Improve Performance?* Unknown Publisher.
- Arnold, J., & Toledano, P. (2021). *Corporate Net-Zero Pledges; The Bad and the Ugly*. Available at: https://scholarship.law.columbia.edu/sustainable_investment_staffpubs/211
- Avidan, M., Etzion, D., & Gehman, J. (2019). Opaque transparency: How material affordances shape intermediary work. *Regulation & Governance*, 13(2), 197-219.
- Bams, D., & Van der Kroft, B. (2022). *Tilting the wrong firms? How inflated ESG ratings negate socially responsible investing under information asymmetries*. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4126986
- Bansal, P., & DesJardine, M. R. (2014). Business sustainability: It is about time. *Strategic Organization*, 12(1), 70-78.
- Bansal, P., Kim, A., & Wood, M. O. (2018). Hidden in plain sight: The importance of scale in organizations' attention to issues. *Academy of Management Review*, 43(2), 217-241.
- Behnam, M., & MacLean, T. L. (2011). Where is the accountability in international accountability standards?: A decoupling perspective. *Business Ethics Quarterly*, 21(1), 45-72.
- Berg, F., Kölbel, J. F., & Rigobon, R. (2022). Aggregate confusion: The divergence of ESG ratings. *Review of Finance*, 26(6), 1315-1344.
- Bernini, F., Giuliani, M., & La Rosa, F. (2024). Measuring greenwashing: A systematic methodological literature review. *Business Ethics, the Environment & Responsibility*, 33(4), 649-667.
- Besio, C., Pronzini, A. (2014) Morality, Ethics, and Values Outside and Inside Organizations: An Example of the Discourse on Climate Change. *Journal of Business Ethics*, 119 (3), 287–300.
- Bjørn, A., Tilsted, J. P., Addas, A., & Lloyd, S. M. (2022). Can science-based targets make the private sector Paris-aligned? A review of the emerging evidence. *Current climate change reports*, 8(2), 53-69.
- Blagoev, B., Hernes, T., Kunisch, S., & Schultz, M. (2024). Time as a research lens: A conceptual review and research agenda. *Journal of Management*, 50(6), 2152-2196.
- Boiral, O. (2007). Corporate greening through ISO 14001: A rational myth? *Organization Science*, 18(1), 127-146.
- Boiral, O., Brotherton, M. C., Talbot, D., & Guillaumie, L. (2025). Avoiding Corporate Greenwashing? Sustainability Silence Narratives in the Agri-Food Industry. *Business Ethics, the Environment & Responsibility (Open Access)*, <https://onlinelibrary.wiley.com/doi/10.1111/beer.12847>.
- Bowen, F. (2014). *After greenwashing: Symbolic corporate environmentalism and society*. Cambridge University Press.
- Brundtland, G. H. (1987). Our common future—Call for action. *Environmental Conservation*, 14(4), 291-294.
- Busch, T., Johnson, M., & Pioch, T. (2022). Corporate carbon performance data: Quo vadis?. *Journal of Industrial Ecology*, 26(1), 350-363.
- Bushee, B. J., Gow, I. D., & Taylor, D. J. (2018). Linguistic complexity in firm disclosures: Obfuscation or information? *Journal of Accounting Research*, 56(1), 85-121.
- Callery, P. J., & Kim, E. H. (2025). Set & done? Trade-offs between stakeholder expectation and attainment pressures in corporate carbon target management. *Journal of Management Studies*, 62(7), 2770-2804.
- Callery, P. J., & Perkins, J. (2021). Detecting false accounts in intermediated voluntary disclosure. *Academy of Management Discoveries*, 7(1), 40–56.
- Chatterji, A. K., Durand, R., Levine, D. I., & Touboul, S. (2016). Do ratings of firms converge? Implications for managers, investors and strategy researchers. *Strategic Management Journal*, 37(8), 1597-1614.
- Chatterji, A. K., & Toffel, M. W. (2010). How firms respond to being rated. *Strategic Management Journal*, 31(9), 917-945.
- Chithambo, L., Taurigana, V., Tingbani, I., & Achiro, L. (2022). Stakeholder pressure and greenhouses gas voluntary disclosures. *Business Strategy and the Environment*, 31(1), 159–172.

- Cho, C. H., Laine, M., Roberts, R. W., & Rodrigue, M. (2015). Organized hypocrisy, organizational façades, and sustainability reporting. *Accounting, Organizations and Society*, 40, 78-94.
- Cho, C. H., Laine, M., Roberts, R. W., & Rodrigue, M. (2018). The frontstage and backstage of corporate sustainability reporting: Evidence from the Arctic National Wildlife Refuge Bill. *Journal of Business Ethics*, 152(3), 865-886.
- Cho, C. H., Michelon, G., & Patten, D. M. (2012). Impression management in sustainability reports: An empirical investigation of the use of graphs. *Accounting and the Public Interest*, 12(1), 16-37.
- Christensen, L. T., Morsing, M., & Thyssen, O. (2020). Timely hypocrisy? Hypocrisy temporalities in CSR communication. *Journal of Business Research*, 114, 327-335.
- Crilly, D., Zollo, M., & Hansen, M. T. (2012). Faking it or muddling through? Understanding decoupling in response to stakeholder pressures. *Academy of Management Journal*, 55(6), 1429-1448.
- Cyert, R. M., & March, J. G. (1963). *A behavioral theory of the firm*. Engelwood Cliffs, NJ: Prentice Hall.
- Deegan, C. (2002). Introduction: the legitimising effect of social and environmental disclosures-a theoretical foundation. *Accounting, Auditing & Accountability Journal*, 15(3), 282-311.
- Dahlmann, F., Branicki, L., & Brammer, S. (2019). Managing carbon aspirations: The influence of corporate climate change targets on environmental performance. *Journal of Business Ethics*, 158(1), 1-24.
- Davidson, R., & MacKinnon, J. G. (1993). *Estimation and inference in econometrics*. New York, NY: Oxford University Press.
- Deloitte. (2025). *2025 C-suite sustainability report: The next wave of business value*. Deloitte.
- Delmas, M., & Burbano, V. (2011). The drivers of greenwashing. *California Management Review*, 54(1), 64-87.
- DiMaggio, P., & Powell, W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, 48(2), 147-160.
- Doshi, A. R., Dowell, G. W., & Toffel, M. W. (2013). How firms respond to mandatory information disclosure. *Strategic Management Journal*, 34(10), 1209-1231.
- Dragomir, V. D. (2012). The disclosure of industrial greenhouse gas emissions: a critical assessment of corporate sustainability reports. *Journal of Cleaner Production*, 29, 222-237.
- Durand, R., Hawn, O., & Ioannou, I. (2019). Willing and able: A general model of organizational responses to normative pressures. *Academy of Management Review*, 44(2), 299-320.
- Duriau, V. J., Reger, R. K., & Pfarrer, M. D. (2007). A Content Analysis of the Content Analysis Literature in Organization Studies: Research Themes, Data Sources, and Methodological Refinements. *Organizational Research Methods*, 10(1), 5-34.
- Etzion, D., Gehman, J., Ferraro, F., & Avidan, M. (2017). Unleashing sustainability transformations through robust action. *Journal of Cleaner Production*, 140, 167-178.
- Etzion, D., & Ferraro, F. (2010). The role of analogy in the institutionalization of sustainability reporting. *Organization Science*, 21(5), 1092-1107.
- Fabrizio, K. R., & Kim, E. H. (2019). Reluctant disclosure and transparency: Evidence from environmental disclosures. *Organization Science*, 30(6), 1207-1231.
- Foroughi, H., Coraiola, D. M., Rintamäki, J., Mena, S., & Foster, W. M. (2020). Organizational memory studies. *Organization Studies*, 41(12), 1725-1748.
- Fung, A., Graham, M., & Weil, D. (2007). *Full disclosure: The perils and promise of transparency*.: Cambridge University Press.
- Forester, J. (1993). *Critical theory, public policy, and planning practice*.: State University of New York Press.
- Gaim, M., Clegg, S., & Cunha, M. P. E. (2021). Managing impressions rather than emissions: Volkswagen and the false mastery of paradox. *Organization Studies*, 42(6), 949-970.
- Giddings, B., Hopwood, B., & O'brien, G. (2002). Environment, economy and society: fitting them together into sustainable development. *Sustainable Development*, 10(4), 187-196.
- Gümüşay, A. A., & Reinecke, J. (2024). Imagining desirable futures: A call for prospective theorizing with speculative rigour. *Organization Theory*, 5(1).
- Hafenstein, A., & Bassen, A. (2016). Influences for using sustainability information in the investment decision-making of non-professional investors. *Journal of Sustainable Finance & Investment*, 6(3), 186-210.
- Haller, A., Van Staden, C. J., & Landis, C. (2018). Value added as part of sustainability reporting: Reporting on distributional fairness or obfuscation? *Journal of Business Ethics*, 152, 763-781.
- Impink, J., Paananen, M., & Renders, A. (2022). Regulation-induced disclosures: Evidence of information overload?. *Abacus*, 58(3), 432-478.
- Ioannou, I., Xin Li, S., & Serafeim, G. (2016). The effect of target difficulty on target completion: The

- case of reducing carbon emissions. *Accounting Review*, 91(5), 1467-1492.
- Kaplan, S., & Orlikowski, W. J. (2013). Temporal work in strategy making. *Organization Science*, 24(4), 965-995.
- Kim, S. (2024). Investor preferences and responses to disclosure: Evidence from carbon net-zero pledges. Available at SSRN 4846045.
- Kim, J., Fairclough, S., & Dibrell, C. (2017). Attention, action, and greenwash in family-influenced firms? Evidence from polluting industries. *Organization & Environment*, 30(4), 304-323.
- Larcker, D. F., Pomorski, L., Tayan, B. & Watts, E. ESG Ratings: A Compass without Direction (2022). Rock Center for Corporate Governance at Stanford University. Forthcoming, Available at SSRN: <https://ssrn.com/abstract=4179647>
- Lehavy, R., Li, F., & Merkley, K. (2011). The effect of annual report readability on analyst following and the properties of their earnings forecasts. *The Accounting Review*, 86(3), 1087-1115.
- Levy, D. L., & Egan, D. (2003). A neo-gramscian approach to corporate political strategy: Conflict and accommodation in the climate change negotiations. *Journal of Management Studies*, 40(4), 803-829.
- Lewis, B. W., Walls, J. L., & Dowell, G. W. (2014). Difference in degrees: CEO characteristics and firm environmental disclosure. *Strategic Management Journal*, 35(5), 712-722.
- Locke, E. A., & Latham, G. P. (1990). A theory of goal setting & task performance. Englewood Cliffs, NJ: Prentice Hall.
- Lyon, T. P., & Maxwell, J. W. (2011). Greenwash: Corporate environmental disclosure under threat of audit. *Journal of Economics & Management Strategy*, 20(1), 3-41.
- Lyon, T. P., & Montgomery, W. A. (2015). The means and end of greenwash. *Organization & Environment*, 28(2), 223-249.
- Malen, J. (2022). Moving the goalposts: Aspiration re-operationalization in response to failure to achieve environmental performance targets. *Academy of Management Discoveries*, 8(3), 357-383.
- Marquis, C., Toffel, M. W., & Zhou, Y. (2016). Scrutiny, norms, and selective disclosure: A global study of greenwashing. *Organization Science*, 27(2), 483-504.
- McDonnell, M.-H., & King, B. (2013). Keeping up appearances: Reputational threat and impression management after social movement boycotts. *Administrative Science Quarterly*, 58(3), 387-419.
- Megura, M., & Gunderson, R. (2022). Better poison is the cure? Critically examining fossil fuel companies, climate change framing, and corporate sustainability reports. *Energy Research & Social Science*, 85(102388), 1-10.
- Mena, S., Rintamäki, J., Fleming, P., & Spicer, A. (2016). On the forgetting of corporate irresponsibility. *Academy of Management Review*, 41(4), 720-738.
- Meyer, J. W., & Rowan, B. (1977). Institutionalized organizations: Formal structure as myth and ceremony. *American Journal of Sociology*, 83(2), 340-363.
- Montgomery, A. W., Lyon, T. P., & Barg, J. (2024). No end in sight? A greenwash review and research agenda. *Organization & Environment*, 37(2), 221-256.
- Morales-Raya, M., & Muñoz, P. (2024). Varieties of time in business sustainability research: An integrative review and research agenda. *Organization & Environment*, 37(2), 257-297.
- Nguyen, Q., Diaz-Rainey, I., Kitto, A., McNeil, B. I., Pittman, N. A., & Zhang, R. (2023). Scope 3 emissions: Data quality and machine learning prediction accuracy. *PLOS climate*, 2(11).
- Okhmatovskiy, & David, R. J. (2012). Setting your own standards: Internal corporate governance codes as a response to institutional pressure. *Organization Science*, 23(1), 155-176.
- Oliver, C. (1991). Strategic responses to institutional processes. *Academy of Management Review*, 16(1), 145-179.
- OpenAI. (2025). ChatGPT [Large language model]. Retrieved from <https://chat.openai.com/>
- Ortiz-de-Mandojana, N., & Bansal, P. (2016). The long-term benefits of organizational resilience through sustainable business practices. *Strategic Management Journal*, 37(8), 1615-1631.
- Patelli, L., & Pedrini, M. (2014). Is the optimism in CEO's letters to shareholders sincere? Impression management versus communicative action during the economic crisis. *Journal of Business Ethics*, 124(1), 19-34.
- Peterson, K., Schmardebeck, R., & Wilks, T. J. (2015). The earnings quality and information processing effects of accounting consistency. *The Accounting Review*, 90(6), 2483-2514.
- Peloza, J., Loock, M., Cerruti, J., & Muyot, M. (2012). Sustainability: How stakeholder perceptions differ from corporate reality. *California Management Review*, 55(1), 74-97.
- Phillips, R., Schrempf-Stirling, J., & Stutz, C. (2020). The past, history, and corporate social responsibility. *Journal of Business Ethics*, 166(2), 203-213.
- Pinkse, J., & Busch, T. (2013). The emergence of corporate carbon norms: Strategic directions and

- managerial implications. *Thunderbird International Business Review*, 55(6), 633-645.
- Provis, C. (2010). Virtuous decision making for business ethics. *Journal of Business Ethics*, 91 (Suppl 1), 3-16.
- R Core Team. (2024). *R: A language and environment for statistical computing* (Version 4.5.1). R Foundation for Statistical Computing. <https://www.r-project.org/>
- Raghunandan, A., & Rajgopal, S. (2022). Do ESG funds make stakeholder-friendly investments? *Review of Accounting Studies*, 27(3), 822-863.
- Reid, E. M., & Toffel, M. W. (2009). Responding to public and private politics: Corporate disclosure of climate change strategies. *Strategic Management Journal*, 30(11), 1157-1178.
- Seele, P., & Gatti, L. (2017). Greenwashing revisited: In search of a typology and accusation-based definition incorporating legitimacy strategies. *Business Strategy and the Environment*, 26(2), 239-252.
- Shabana, K. M., Buchholtz, A. K., & Carroll, A. B. (2017). The institutionalization of corporate social responsibility reporting. *Business & Society*, 56(8), 1107-1135.
- Short, J. L., & Toffel, M. W. (2010). Making self-regulation more than merely symbolic: The critical role of the legal environment. *Administrative Science Quarterly*, 55(3), 361-396.
- Sinnewe, E., Yao, T., & Zaman, M. (2021). Informing or obfuscating stakeholders: Integrated reporting and the information environment. *Business Strategy and the Environment*, 30(8), 3893-3906.
- Slawinski, N., & Bansal, P. (2015). Short on time: Intertemporal tensions in business sustainability. *Organization Science*, 26(2), 531-549.
- Slawinski, N., Pinkse, J., Busch, T., & Banerjee, S. B. (2017). The role of short-termism and uncertainty avoidance in organizational inaction on climate change: A multi-level framework. *Business & Society*, 56(2), 253-282.
- S&P Global Ratings (2024). *Industry Credit Outlook Update 2024*. S&P Global Ratings. <https://www.spglobal.com/ratings/en/research-insights/topics/industry-top-trends-2024>
- Talbot, D., & Boiral, O. (2018). GHG Reporting and Impression Management: An Assessment of Sustainability Reports from the Energy Sector. *Journal of Business Ethics*, 147(2), 367-383.
- Thornton, P. H., & Ocasio, W. (1999). Institutional logics and the historical contingency of power in organizations: Executive succession in the higher education publishing industry, 1958-1990. *American Journal of Sociology*, 105(3), 801-843.
- Walls, J. L., Berrone, P., & Phan, P. H. (2012). Corporate governance and environmental performance: Is there really a link? *Strategic Management Journal*, 33(8), 885-913.
- Welch, E. W., Rana, A., & Mori, Y. (2003). The promises and pitfalls of iso 14001 for competitiveness and sustainability: A comparison of Japan and the United States. *Greener Management International* (44), 59-73.
- Wijen, F. (2014). Means versus ends in opaque institutional fields: Trading off compliance and achievement in sustainability standard adoption. *Academy of Management Review*, 39(3), 302-323.
- World Business Council for Sustainable Development (WBCSD), & World Resources Institute (WRI). (2004). *The Greenhouse Gas Protocol: A corporate accounting and reporting standard*. <https://ghgprotocol.org/>
- World Meteorological Organization (WMO). (2025). *State of the Climate Update for COP30*. Retrieved from <https://wmo.int/publication-series/state-of-climate-update-cop30>

TABLES AND FIGURES

Table 1

Temporal Consistency Across Non-Financial Disclosure Frameworks

Framework	Scope	Status/format	Consistency directives
Global Reporting Initiative (GRI)	Global	Voluntary standards	Comparability is mentioned as a general principle, consistency as a subprinciple
Task Force on Climate-Related Financial Disclosure (TFCD)	Global	Voluntary recommendations	General guidelines on aligning historical, current, and future information
Corporate Sustainability Reporting Directive (CSRD)	Europe, large companies	Mandatory regulations	Comparability is mentioned as a general principle, consistency as a subprinciple
The GHG protocol	Global	Voluntary standards	Includes detailed guidelines on how to maintain consistency
CDP	Global investors	Voluntary survey	Firms can choose to report past targets and historical performance
SBT	Global	Voluntary certification	Targets need to be verified every five years

Table 2

Number of Companies, Targets, and Average Number of Targets per Company per Carbon Dependence Sector

Carbon Dependence Sector	Number of Companies	Number of Targets	Targets per Company
Low	26	52	2.00
Medium	29	69	2.38
High	21	90	4.28
N	76	211	---

Table 3*Descriptive Statistics*

Category	Variable	Mean	SD	Median
DV(H3)	Target achievement	0.55	0.50	1
IV(H3) /DV(H2)	Temporal inconsistency	0.55	0.50	1
IV (H2)	Low	0.36	0.48	0
	Medium	0.40	0.49	0
	High	0.24	0.43	0
Control variables (Target)	Set year	2013	3.63	2014
	Duration	10.76	8.57	8.59
	Commitment (per year)	0.04	0.04	0.03
	Type (Abs/Int)	0.53	0.50	1
	Scope (1 & 2)	0.21	0.40	0
	Scope (All/else)	0.04	0.20	0
	Scope (NA)	0.75	0.43	1
	Coverage (GHG/specific)	0.59	0.50	0
	SBT (Yes/No)	0.20	0.40	0
	GRI (Yes/No)	0.31	0.46	0
Control variables (Firm)	CEO changes	0.66	0.71	1
	Paris Agreement Withdrawal	0.44	0.50	0
	Return on Assets (ROA)	1.06	0.08	1.05
	Size (log Assets)	17.32	0.94	17.35
	Sales growth	1.01	0.05	1.01
	Leverage (debt/assets)	0.34	0.14	0.34
	Cap. Intensity (CAPEX/sales)	0.15	0.14	0.14
	R&D Intensity	0.01	0.01	0.00
	R&D Impute	0.50	0.50	0.50
	Adv. Intensity	0.01	0.03	0.00
	Adv. Impute	0.66	0.47	1

Table 4*Correlations*

#	Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1	Target Achieved	1.00													
2	Temporal inconsistency	-0.56	1.00												
3	Set year	-0.17	0.30	1.00											
4	Duration	-0.34	0.31	0.17	1.00										
5	Commitment	0.01	0.01	0.11	-0.22	1.00									
6	CEO changes	-0.01	-0.09	-0.15	0.10	-0.08	1.00								
7	Paris Agreement Withdrawal	-0.00	0.05	-0.10	0.00	0.00	0.38	1.00							
8	ROA	0.03	0.08	0.01	0.01	-0.08	0.17	0.12	1.00						
9	Size	-0.10	0.04	0.11	0.06	-0.15	-0.07	-0.12	-0.26	1.00					
10	Sales growth	0.02	0.07	-0.07	0.08	-0.02	0.26	0.19	0.73	-0.36	1.00				
11	Leverage	0.02	0.09	-0.06	0.07	-0.08	0.02	0.08	0.04	-0.42	0.12	1.00			
12	Capital Intensity	-0.15	0.30	0.23	0.30	-0.13	-0.17	0.05	-0.20	0.31	-0.35	-0.04	1.00		
13	R&D Intensity	0.06	-0.17	-0.27	-0.13	0.07	0.11	0.03	0.10	-0.23	0.11	-0.05	-0.43	1.00	
14	Adv. Intensity	0.06	-0.19	-0.14	-0.17	0.07	0.03	0.03	0.03	-0.34	0.09	0.26	-0.41	0.17	1.00

Table 5*The Effect of Carbon Dependence on Target Inconsistency*

Variable	Model 1	Model 2
Intercept	375.48** (136.82)	339.77* (141.62)
Carbon dependence high	---	2.03 [†] (1.19)
Carbon dependence med	---	1.54 [†] (0.85)
Coverage	0.51 (0.49)	0.57 (0.51)
Type	0.42 (0.45)	0.33 (0.49)
Set year	0.18** (0.07)	0.16* (0.07)
Duration	0.21* (0.08)	0.22* (0.09)
Commitment per year	9.44 [†] (5.19)	10.56* (5.32)
Scope (1&2)	0.24 (0.54)	0.63 (0.62)
Scope (else)	-0.22 (1.50)	-0.40 (1.48)
SBT (adopt)	0.30 (1.02)	0.83 (1.09)
SBT (mention)	-0.22 (0.73)	-0.23 (0.77)
GRI	-1.26* (0.50)	-1.17* (0.52)
CEO changes	-0.64* (0.31)	-0.61 [†] (0.32)
Paris Agreement Withdrawal	-0.04 (0.47)	-0.14 (0.48)
Return on Assets	1.37 (3.61)	1.14 (3.56)
Size	0.01 (0.27)	-0.07 (0.29)
Sales growth	5.09 (6.09)	4.38 (6.19)
Leverage	1.52 (1.66)	1.83 (1.68)
Capex intensity	1.65 (2.62)	-1.14 (3.33)
R&D intensity	2.59 (15.19)	-3.29 (15.96)
R&D imputed	0.30 (0.64)	0.62 (0.67)
Advertising intensity	1.42 (10.76)	10.61 (12.24)
Advertising imputed	1.40* (0.66)	1.16 [†] (0.69)
N	176	176

Note: Table 5 reports point estimates and standard errors (in parentheses) from a logistic regression of the firms' log-odds ratio of Target Consistency on Carbon Dependence. Low Carbon Dependence is the baseline case.

[†] $p < .10$

* $p < .05$

** $p < .01$

*** $p < .001$

Table 6*Analysis of Target Inconsistency and Target Achievement*

Variable	Model 3	Model 4
Intercept	63.16 (143.63)	-265.51 (192.04)
Inconsistency	---	-3.83*** (0.63)
Carbon dependence high	-2.08† (1.20)	-1.69 (1.43)
Carbon dependence med	-0.27 (0.88)	0.75 (1.07)
Coverage	-1.28* (0.52)	-1.33* (0.64)
Type	1.08* (0.49)	1.69** (0.61)
Set year	-0.03 (0.07)	0.13 (0.10)
Duration	-0.21*** (0.06)	-0.20** (0.06)
Commitment per year	-10.81† (5.52)	-9.17 (5.59)
Scope (1&2)	0.15 (0.62)	0.46 (0.79)
Scope (else)	-1.67 (1.42)	-2.12 (1.84)
SBT (adopt)	-0.17 (1.02)	-0.17 (1.17)
SBT (mention)	-0.77 (0.77)	-1.57† (0.93)
GRI	0.18 (0.47)	-0.57 (0.57)
CEO changes	0.13 (0.31)	-0.18 (0.37)
Paris Agreement Withdrawal	-0.28 (0.45)	-0.30 (0.51)
Return on Assets	-0.44 (3.63)	-2.04 (4.70)
Size	-0.10 (0.29)	-0.11 (0.36)
Sales growth	-0.24 (6.27)	4.40 (8.39)
Leverage	-0.24 (1.76)	1.43 (2.61)
Capex intensity	5.84† (3.25)	7.77* (3.92)
R&D intensity	-3.16 (16.85)	-1.68 (19.23)
R&D imputed	-0.42 (0.66)	-0.22 (0.82)
Advertising intensity	-30.52* (12.85)	-32.97* (14.97)
Advertising imputed	-2.08** (0.78)	-2.19* (0.89)
N	176	176

Note: Table 6 reports point estimates and standard errors (in parentheses) from a logistic regression of the firms' (log-odds ratio) target achievement regressed on target consistency. Low Carbon Dependence is the baseline case.

† $p < .10$. * $p < .05$ ** $p < .01$ *** $p < .001$

Table 7*Inconsistency Patterns*

Pattern	Cases	Target achievement rate
Hindsight target setting	26	100%
Goalpost shifting	41	44%
Number fudging	13	38%
Target disbanding	81	23%

Table 8

Number of Companies Engaging in Temporal Inconsistency (at Least One Target) per Carbon Dependence Level and Type of Inconsistency

Carbon Dependence	Number of companies	Target disbanding	Goalpost shifting	Hindsight target setting	Number fudging	Any inconsistency
High	21	19 (90%)	10 (48%)	6 (29%)	2 (10%)	20 (95%)
Medium	29	18 (62%)	9 (31%)	8 (28%)	6 (21%)	27 (93%)
Low	26	7 (27%)	7 (27%)	4 (15%)	2 (8%)	14 (54%)
Total	76	44 (58%)	26 (34%)	18 (24%)	10 (13%)	61 (80%)

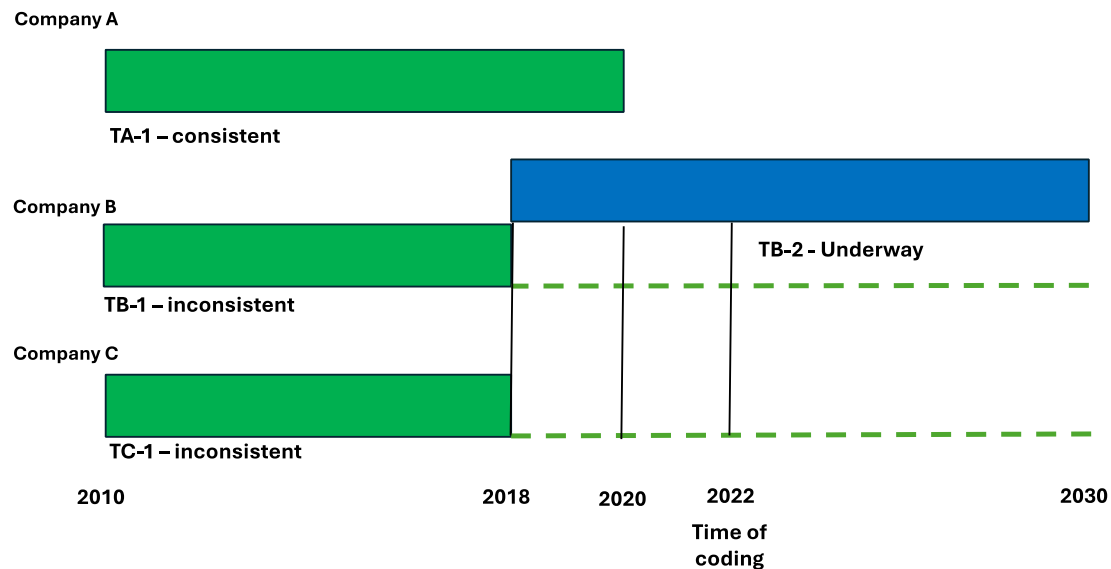
Figure 1*An Example of a Target Coding*

Figure 2

Hindsight Target Setting

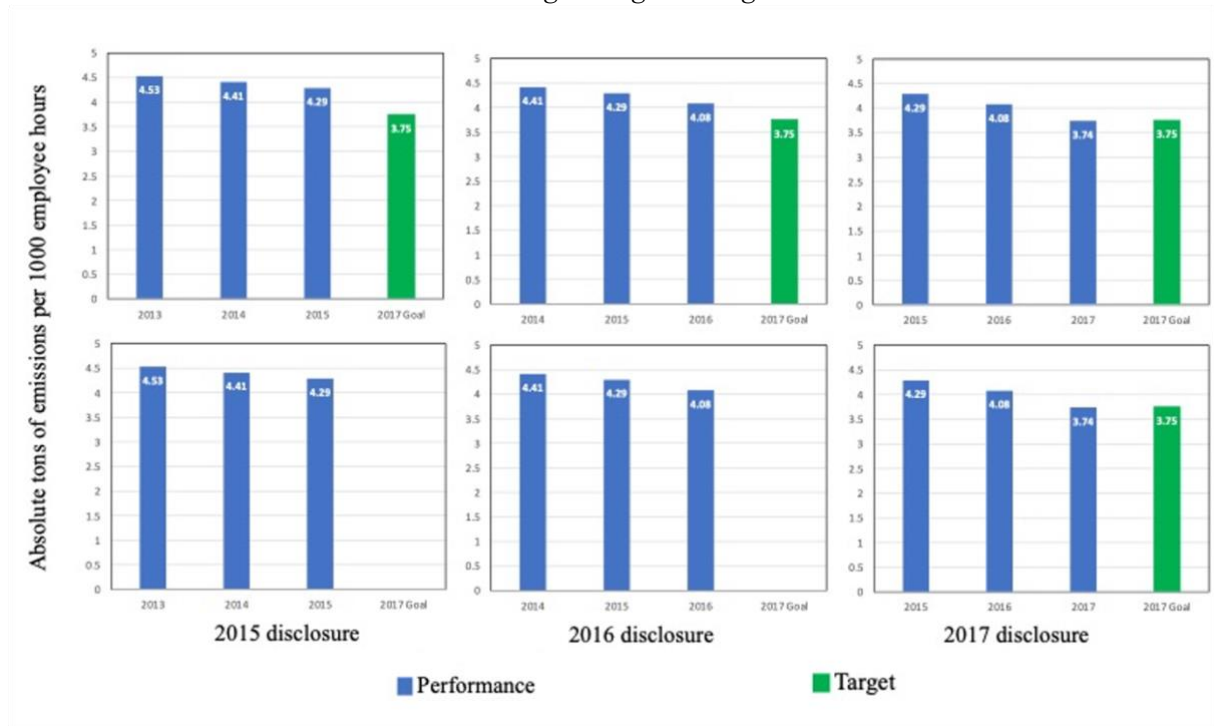


Figure 3

Goalpost Shifting



Figure 4

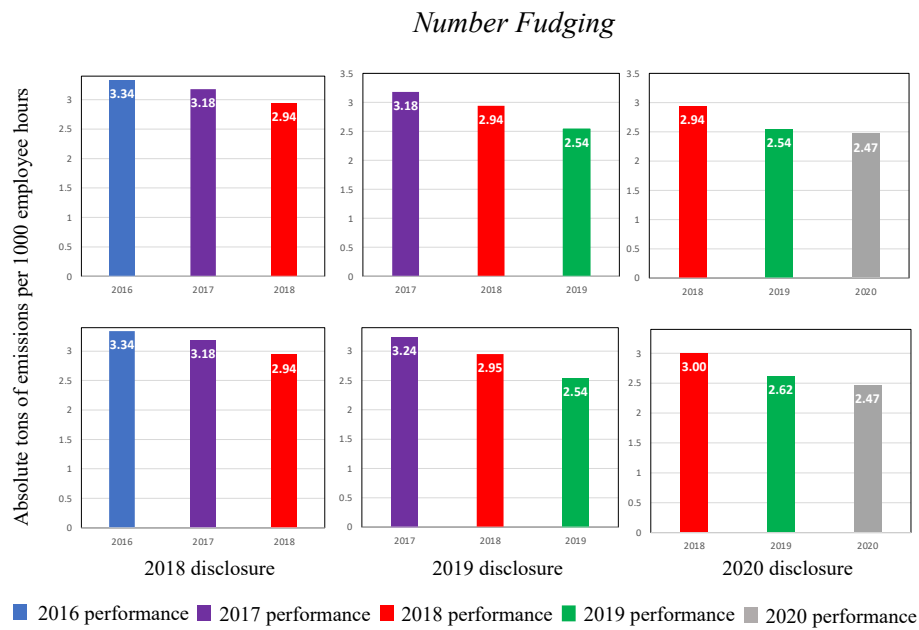


Figure 5

