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UNVEILING GREENHUSHING PRACTICES UNDER THE EUROPEAN GREEN CLAIMS DIRECTIVE: THE INTERPLAY OF GREENWASHING, LEGAL RISK, AND CORPORATE ESG COMMUNICATIONS

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Abstract

This study analyses the Green Claims Directive's (GCD) effectiveness in reducing greenwashing and explores a new trend: greenhushing, the strategic reduction of environmental communication. We use regression analysis to assess how Greenwashing Scores correlate with greenhushing practices directed towards both investors and consumers.

Our findings reveal key differences in greenhushing across channels. Companies engaging in greenwashing tend to decrease environmental communication with investors (greenhushing) after the GCD introduction. However, Greenwashing Scores do not statistically link to Greenhushing in Consumer Channels, suggesting companies are less likely to suppress environmental content for consumers. Additionally, factors like board structure do not significantly influence greenhushing behaviour, though more profitable companies reduced their environmental communication with consumers.

This research sheds light on corporate environmental communication strategies in the context of GCD effectiveness. Our insights inform policymakers, investors, and corporate leaders by revealing the complexities of mitigating greenwashing and the evolving nature of environmental communication.

1. Introduction

According to a report by The Copernicus Programme (2023), the Earth Observation component of the European Union's (EU) Space Programme, 2023 had the highest global temperature compared to records going back to 1850, which is when we started collecting climate data. Furthermore, all 365 days of 2023 had temperatures 1°C above the pre-industrial level (1850-1900), and more than 50% of these days were 1.5°C above the pre-industrial level. This set the 2023 average at 1.48°C above the pre-industrial level, which is concerningly close to the 1.5°C limit that was set by the 2015 Paris Agreement to stop dangerous climate change. Of course, 2023 dealt humanity a bad hand with El Niño, which is a natural phenomenon that makes winters warmer around the world. However, El Niño reminded us that climate catastrophe is not far away, as we experienced the effect that higher temperatures have on the weather. 2023 had an unprecedented number of extreme weather events, among them cyclones that produce 11-metre waves, heat waves that melt roads, floods that crush dams, and wildfires that turn towns into ash (Keith-Lucas, 2023). These events have solidified the importance of tackling climate change, which should begin with addressing its root cause - consumption.

In theory, consumers should stop purchasing goods and services from companies that produce a negative impact on the environment, and investors should stop allocating resources to said companies. However, consumers and investors seldom have the necessary expertise to determine what a company's environmental impact is. Many sustainability frameworks have been developed to aid stakeholders in their decision-making. Those are the Global Reporting Initiative (GRI) and the Sustainability Accounting Standards Board (SASB) to name a few. Company Environmental, Social, and Corporate Governance (ESG) reports are where the analysis from these frameworks is summarised. A company's ESG information is akin to the nutrition fact label of food products - it gives stakeholders a measure that allows them to compare different companies. Public awareness of ESG has increased in tandem with awareness of climate change, and companies have followed suit. Stammbach et al. (2023) observed a steady rise in the number of environmental claims made during quarterly earnings calls since the Paris Agreement in 2015. However, this escalating trend doesn't necessarily indicate progress, as ESG information, unlike nutrition fact labels, is fraught with ambiguity. Companies abuse this ambiguity for their benefit, which has led to the emergence of greenwashing (Musgrove et al., 2018), defined by the European Parliament (2024) as "the practice of giving a false impression of the environmental impact or benefits of a product,

which can mislead consumers." Environmental claims encompass statements made by companies regarding the environmental effects of their products or operations. These claims can refer to various aspects such as the product's composition (e.g., "made from recycled materials"), manufacturing process ("energy-efficient production"), disposal method ("recyclable"), or its potential to mitigate environmental impact ("lower emissions," "zero-waste"). However, misleading environmental claims distort the true environmental impact of a product or business. They may lack substantiated evidence, contain false information, omit crucial details, or be exaggerated. Furthermore, they might be presented in an unclear, ambiguous, or inaccurate manner (World Federation of Advertisers, 2022).

The European Commission's 2020 "sweep" found that up to 40% of examined ESG claims in Europe "included vague and general statements such as 'conscious', 'eco-friendly', 'sustainable'" and that about half of all green labels had weak or non-existent verification or evidence (European Commission, 2021). This laid the foundation for the Green Claims Directive in the European Union. The European Union Commission has proposed the Green Claims Directive (GCD), which aims to establish rules for companies' voluntary environmental claims (European Commission, 2023). The GCD, formally released on March 23, 2023, is now awaiting approval from both the European Parliament and the Council of Member States. Upon adoption, the integration of its provisions into the national laws of each member state will become critical. The primary goal of the GCD is to address the problem of greenwashing by enabling investors and consumers to make well-informed choices grounded in reliable environmental claims. The GCD seeks to do this by establishing a set of minimum standards for accurately communicating environmental impact. It emphasises the significance of substantiating environmental claims with scientific evidence, especially within the context of carbon offsetting.

Smith (2023) considers the GCD to be an additional source of litigation risk for companies; consequently, it is anticipated that several companies will retract their claims prior to the implementation of the regulation to avoid the possibility of a lawsuit. In fact, instances of such occurrences have already been reported in the media. For example, Wootton (2023) brought to light the actions of Australian super funds in reducing their climate obligations because of heightened regulatory scrutiny. Another example is Lazada, a subsidiary of Alibaba. Following allegations of greenwashing, whereby the business was accused of misrepresenting "less-plastic" items as environmentally friendly, the head of Lazada's sustainability department discreetly resigned, and the organisation

ceased its communication on its environmental initiatives (Hicks, 2022). A similar pattern has been observed in more extensive research initiatives; for instance, South Pole (2022) in their Net Zero report discovered that nearly a quarter (23%) of the organisations striving for net zero are opting not to disclose their progress. Informally, these tactics have become known as greenhushing – the intentional practice of reducing environmental communication (Letzing, 2022). Such behaviour was a prediction put forward by Lyon and Maxwell (2011), who said that "there is a real possibility that the threat of public backlash for greenwashing will cause firms to "clam up" rather than become more open and transparent." While this issue may not appear to have an immediate and severe impact, it does result in significant negative consequences.

First, the act of publicising sustainability initiatives and establishing sustainability objectives and targets serves as guidance for the strategic direction of a company. Additionally, it fosters a sense of encouragement among peers and competitors, prompting them to adopt and enhance their own sustainability practices (Huang et al., 2022). Consequently, this process stimulates innovation within the realm of sustainability. Furthermore, environmental communication fosters the spread of knowledge, as smaller enterprises can observe and use other companies' sustainability products or strategies as a benchmark for their own endeavours.

The second element to consider is that when sustainability communication is diminished, it results in a decrease in transparency, rendering prior regulatory efforts to increase transparency ineffective (Bromley and Powell, 2012). Therefore, the evaluation of the actual environmental initiatives undertaken by the organisation becomes more challenging. This might be especially critical for investment firms that are pursuing investment strategies focused on ESG factors, intending to direct their funds towards businesses that exhibit more sustainability.

Greenhushing has the potential to go unnoticed by the general public. Hence, in light of the forthcoming GCD, it is essential to understand the anticipated responses of companies. Our study has two primary objectives. The principal aim of our study is to examine the relationship between greenwashing and greenhushing to determine whether companies employ greenhushing to obscure false environmental claims that they have previously made, that is, to conceal greenwashing. The second objective of our study is to deconstruct how companies convey their environmental actions to two stakeholder groups, investors and consumers, to determine which channel of communication is most vulnerable to greenhushing. Therefore, we set the following research questions:

RQ1: To what extent does the implementation of the Green Claims Directive (GCD) contribute to greenhushing practices by companies?

RQ2: Within which communication channels—investor or consumer—does the Green Claims Directive (GCD) demonstrate effectiveness in curbing greenwashing practices by companies?

In our methodology, we first identify the communication channels utilized by companies to convey their environmental efforts, distinguishing between those targeted at consumers and investors. Our sample comprises 1102 companies from the S&P 500 and STOXX Europe 600 indices, which we reduce by excluding firms from the financial sector. Although enforcement of GCD in the EU is yet to take place, all companies with sales in the EU will be obliged to comply with its provisions (Sustainable Fitch, 2023). Thus, the largest US companies with sales in the EU will also be subject to GCD-related scrutiny and penalties.

For the Consumer Disclosure Channel, we collect data from company websites using the Internet Archive, also known as the Wayback Machine, focusing on historical versions of web pages. We construct a proxy for environmental information by examining changes in web page content before and after the announcement of GCD. We quantify changes in environmental disclosure by counting the number of Environmental Words on selected web pages.

For the Investor Channel, we utilise Bloomberg's Environmental Pillar Disclosure Scores to quantify changes in environmental disclosures aimed at investors. Additionally, we calculate a Greenwashing Score using Bloomberg data, considering both environmental disclosure and performance scores normalized by industry norms.

To evaluate the effectiveness of the GCD in reducing greenwashing in company disclosure channels, we examine the determinants of companies' greenhushing practices. First, we create a Greenwashing Score by adapting the methodology from Yu et al. (2020). In our regression analysis, we perform Ordinary Least Squares (OLS) regression to determine the relationship between companies' greenwashing behaviour and their adjustments in environmental disclosures across consumer and investor channels in light of GCD. By including the Greenwashing Score as a key independent variable, we can assess whether companies that greenwash are the ones who engaged in greenhushing practices in the 2022 - 2023 period. If such is the case, we may infer that GCD has the

potential to defeat greenwashing. In addition, we incorporate corporate governance indicators such as board independence, gender diversity, and the presence of sustainability committees into the model, along with control variables like industry, and financial performance. Through this methodological approach, we aim to understand how companies adapt their environmental communication strategies across different channels in response to regulatory events and stakeholder pressures.

Our research significantly contributes to the existing body of literature by offering a novel perspective on environmental disclosure practices, particularly through the distinct lenses of investor and Consumer Channels. While prior studies have explored environmental disclosure from a broad perspective, our focus on delineating between investor and Consumer Channels adds a new dimension to understanding corporate communication strategies. By scrutinising companies' responses to regulatory events and stakeholder pressures across these channels, we unveil specific behaviours and patterns that have until now remained relatively unexplored.

The relevance of our study lies in its timely examination of how companies adapt their environmental communication strategies amidst evolving regulatory landscapes and increasing stakeholder demands. By dissecting environmental disclosure practices across different channels, we provide valuable insights into how companies strategically communicate their sustainability efforts to investors and consumers. Our findings have implications for policymakers, investors, and corporate decision-makers, informing their understanding of the complexities involved in corporate environmental communication.

In the following paragraphs, we delve into the literature review and our methodology, detailing how we collect and analyse data from both investor and Consumer Channels. Subsequently, we present our findings, highlighting key patterns and trends observed across different communication channels. Finally, we discuss the implications of our research for theory, practice, and policy, underscoring the significance of our contributions to the broader discourse on corporate sustainability and transparency.

2. Literature review

2.1. Environmental disclosure theories

This literature review section delves into theories explaining why companies engage in sustainability disclosures.

Prior studies have identified a few theories that explain why companies make ESG disclosures. The most common is the **stakeholder theory**, which posits that firms make disclosures in response to stakeholder demand (Tsang et al., 2023). For example, consumers, recognising the threat of climate change, have become more environmentally conscious, and as a result, they shift their consumption preferences to more sustainable and environmentally friendly products (Marquis and Toffel, 2016; Musgrove et al., 2018). Therefore, ESG transparency is a crucial tool for attracting customers. Additionally, detailed ESG disclosures are favoured by investors because they reduce information asymmetries by communicating critical risks and enabling investors to more thoroughly evaluate the company's long-term viability. ESG disclosures provide investors with more transparent information on how the company runs its business, thereby allowing investors to assess the risk and the long-term viability of the firm's operations. Investors in a Wong and Petroy (2020) survey acknowledge that ESG disclosures are one of the main sources for investment decision-making. Baloria et al. (2019) suggest that institutional and activist shareholders might exert additional pressure on companies to disclose ESG information. As a result, organisations that prioritise ESG transparency experience improved access to finance (Cheng et al., 2014) and reduced cost of capital (Tan et al., 2020). Ultimately, companies that prioritize ESG transparency are better positioned to create long-term value for their stakeholders than those who disregard it.

Legitimacy theory posits that companies may disclose greater amounts of ESG information to try to compensate for their poor ESG performance (Tsang et al., 2023). This practice is considered "greenwashing," as it is typically associated with a significant gap between ESG disclosure and performance (Pinnuck et al., 2019). Indeed, prior research confirms that greater sustainability disclosure may not always indicate higher credibility of the disclosed information. Yu et al. (2020) look at sustainability disclosures in conjunction with sustainability performance. The authors define “greenwashers” as firms that are trying to seem transparent and disclose a lot of information on their ESG initiatives but who at the same time perform poorly on ESG aspects. Following this logic, a gap between the ESG disclosure and the actual ESG performance serves as an indicator of misleading environmental communication, which is considered greenwashing (Benjamin et al., 2022). Misleading, inaccurate, or unfounded ESG disclosures described above increase the likelihood of facing lawsuits. Consequently, those companies engaging in "greenwashing" are more susceptible to litigation (Ogier, 2024).

Based on their findings, we expect that:

H1: Companies that have engaged in greenwashing in the past are more likely to employ greenhushing techniques to conceal their previous deceptive actions to avoid the legal risks posed by GCD.

Lastly, **institutional theory** suggests that laws and regulations enforced in the country of the firm's origin dictate the extent to which ESG activities are disclosed (Tsang et al., 2023). This theory highlights the influence of litigation risks on a company's decision-making process regarding ESG disclosure. However, the relationship between litigation risk and sustainability disclosures is more complex and can work both ways (Robinson et al., 2023). On the one hand, managers, per institutional theory, make efforts to comply with regulatory reporting obligations. Therefore, they reveal the essential information to meet legal requirements and minimise the risk of omitting important details by reporting more. On the other hand, managers may want to prevent the legal risk associated with revealing incorrect information and being held responsible for deceiving stakeholders, hence, they have an incentive to report less.

2.2. Environmental disclosure channels

Environmental disclosure channels serve as crucial avenues through which companies disseminate information regarding their environmental practices and commitments. Previous research has extensively explored various investor-facing communication platforms, including annual reports, sustainability reports, earnings calls, analyst forecasts, and Bloomberg Terminal solutions (Ben-Raphael et al., 2017; Loughran and McDonald, 2016; Lock and Seele, 2016). For instance, Robinson et al. (2023) found that managers strategically tailor their environmental communication during earnings calls to mitigate potential legal risks. They observed a preference for forward-looking statements over historical data to navigate litigation concerns. Similarly, Blonder (2023) identified a trend where companies opt for aspirational rather than definitive ESG statements in response to litigation risks, employing vague language to minimise legal exposure.

Amidst the rapid digitalisation of the past two decades, corporate websites have emerged as a novel communication channel that remains relatively underexplored. Unlike traditional disclosure avenues, corporate websites offer direct and immediate communication with stakeholders, bypassing intermediaries and regulatory constraints. This characteristic empowers companies to efficiently disseminate information to a broader audience while enhancing transparency and accessibility. One further benefit of

web pages is that they allow companies to optimise and improve the comprehension of their disclosures, making them accessible to the public (Boulland et al., 2021).

Several studies have dived deeper into investigating the disclosure levels and topics of business web pages by assessing their content using various parameters such as size, length, and words (Boulland et al., 2021; Lynch and Taylor, 2022). Boulland et al. (2021) specifically designed a metric for voluntary environmental disclosure on the websites of companies. For their content-specific metric, the authors propose a couple of options. The first technique is to employ broad theme categories by analysing words embodied in corporate URL strings and calculating the number of topic-related URLs. For instance, it can be deduced that the websites:

https://www.nike.com/sustainability/materials

https://www.apple.com/environment/

will address environmental topics. The second metric proposed by the authors is based on the textual content of the full web page, which is parsed into a list of visible words. Then, they count topic-related keywords in the parsed list.

Prior studies examining the function of corporate web pages as a means of communication have discovered that organisations escalate their environmental disclosures in the aftermath of catastrophic environmental incidents as a way of showcasing their dedication to transparency and sustainability (Boulland et al., 2021). The authors illustrate their point by analysing the April 2010 Deepwater Horizon oil spill and providing empirical evidence that BP has substantially populated environmental content on its web page in relation to this incident. This implies that companies may utilise their corporate websites as a potent instrument to influence their environmental disclosures and respond rapidly to the most recent developments in real-time.

The examples above demonstrate that companies tend to alter and strategically adjust their environmental disclosures within various channels in response to regulatory events and public scrutiny. Therefore, to investigate the effects of the GCD, we explore distinct environmental disclosure channels.

It is essential to recognise that not all litigation risks carry equal weight. Shareholder litigation, for instance, serves as a more substantial governance mechanism compared to consumer litigation (Treepongkaruna et al., 2022). This discrepancy arises from consumers often prioritising issue resolution over legal action due to barriers such as legal system complexity and difficulty finding lawyers or affording them (Morrison, 1991). Consequently, firms are likely to tailor their environmental communication

strategies differently for shareholders and consumers, considering the varying levels of litigation risk associated with each stakeholder group. We hypothesise that:

H2: In response to the GCD, companies will adjust their environmental disclosures in investor-facing communication channels.

Through our research, we aim to contribute to the understanding of firms' environmental disclosure practices amidst evolving regulatory landscapes. Additionally, we aim to fill the research gap concerning the manner in which organisations adapt their environmental communication strategies to different stakeholder audiences through their disclosure channels.

3. Methodology

We begin by identifying the communication channels companies use to disseminate information regarding their environmental and sustainability efforts. Institutional investors leverage sophisticated databases like Bloomberg Terminal for in-depth analysis of complex company data (Ben-Raphael et al., 2017). Conversely, communicating with a broader audience, including consumers, necessitates a more accessible format. Corporate websites, facilitated by the internet's widespread accessibility, serve as a vital communication channel (Boulland et al., 2021). From this understanding, we establish two metrics: one evaluates companies' communication of environmental initiatives to consumers (Consumer Channel), while the other focuses on investor communication (Investor Channel).

3.1. Sample

We compile a dataset consisting of 1103 companies, with 503 listed in the S&P 500 and the remaining 600 in the STOXX Europe 600, based on Bloomberg's classification. We exclude all financial sector companies, totaling 68 from the S&P 500 and 117 from the STOXX Europe 600, resulting in a dataset of 918 companies. This is because sectors such as finance and banking are governed by distinct sustainability regulations, which may have different impacts on their disclosure practices (Yu et al., 2020). Additionally, we extract Uniform Resource Locators (URLs) for company websites from Bloomberg's data. Subsequently, we utilise these websites to construct a variable for greenhushing in the consumer disclosure channel.

3.2. Consumer Channel

3.2.1. Raw data

To quantify greenhushing practices, or lack thereof, of companies on their consumer disclosure channels, we adopt a similar approach to the one used by Boulland et al. (2021), which involves examining company website archives stored in the Internet Archive. The Internet Archive, also known as the Wayback Machine, is a digital archive that stores records of historical versions of websites by periodically crawling available URLs. For a specific URL, the archive stores past versions of its contents as of specific dates (timestamps), e.g., the homepage of youtube.com as of the 31st of March 2023. Additionally, the archive crawls most of the embedded links within a URL, allowing its users to navigate through the website. The Internet Archive has proven to be an excellent investigative source as it provides exact records of statements on websites and allows researchers to track changes over time or after certain events. It has been used to study ESG topics as well, such as Waite and Harrison (2005), Arora et al. (2015), and Boulland et al. (2021).

The records on the Internet Archive can be accessed with their free-to-use API. The API can be called for a specific reference URL, and the API returns a table with all available records for this URL and other URLs that are connected to it. For instance, if we input "youtube.com", the API will return all captures of content on youtube.com that are stored on the archive. We use 4 of the columns given in the output table:

- **Original**. This column contains the full URL of the web page that is stored in the archive. For example, 3i Group's sustainability page "3i.com/sustainability".
- **Timestamp**. A 14-digit string that provides the exact time when the record was stored. For example, "20230530005038" means that the record was stored on 30th of May 2023 at 00:50 and 38 seconds.
- **MIME type**. Short for Multipurpose Internet Mail Extensions, specifies the format of the record. We select all records with "text/html" MIME type to make sure that we focus on text web pages.
- **Status code**. The API also provides the website server's status code, to indicate whether the record can be accessed. We select all records with a status code "200".

3.2.2. Proxy metric for environmental disclosure on Consumer Channel disclosure

For the purposes of this paper, we use the Internet Archive to construct an image of company websites before and after the announcement of the GCD to examine the change in their environmental claims. To prove that companies did in fact delete environmental claims, we manually examined 10 randomly selected companies from the STOXX Europe 600 index. We found that one company had deleted sections from their website that provided additional information on their environmental performance, while another swapped an elaborate description of environmental performance with one-sentence bullet points (Appendix A). Furthermore, this exercise gave us insight into what and where we ought to measure to capture changes in the disclosure channel - the number of words related to environmental claims on special-purpose web pages.

The number of words related to environmental claims would give us a proxy for the number of such claims on the website. Alternatively, we considered using Natural Language Processing (NLP) methods to determine the sentiment of the website content, however, such methods are beyond the scope of our expertise and available resources.

First, we define the set of words related to environmental claims by using Baier et al.'s (2020) ESG dictionary's Environmental topic section, for further reference, we call these Environmental Words (Appendix B). Then, to calculate the number, we count all Environmental Words that can be found in our recreation of the past version of the website. Finally, we observe the change in the number of Environmental Words to quantify changes in the amount of environmental information that is communicated through the consumer disclosure channel. We employ a meticulous set of filtering steps to ensure that we do not record false positive counts.

3.2.3. Filtering data and recreating websites

After extracting all Internet Archive records for a given company, we first label the records as either pre-announcement of GCD or post-announcement of GCD, further we refer to these batches as, respectively, before-event and after-event. We set a wide period for both batches, spanning multiple months, to ensure that we recreate a complete picture of the website. This is a necessary step because most websites do not have daily records for all their web pages, in fact, records for most web pages are sporadic. Thus, we cannot recreate a comprehensive image of a website with records from just a single timestamp. Furthermore, timestamps are measured to the exact second, which exacerbates

the problem. Our solution is to encompass records from multiple months, and delete any duplicates, while keeping the most recent record. We set the before-event period from May 2022 until December 2022; and the after-event period from May 2023 until December 2023. We begin the after-event period in May, because we assume that companies need time to make decisions regarding their disclosure policies. Additionally, we split the before-event and after-event period prior to January 2023 because that is when the GCD announcement was leaked (Abnett, 2023). Thus, we anticipated that companies might react before the official announcement in March 2023. Accordingly, we label the Internet Archive's records as before/after, which can be done by filtering the first 6 digits of the timestamp and omitting all other records.

The second step is removing the duplicates. Our approach of sticking together records from multiple months inevitably produces duplicate entries. Finding duplicates is not straightforward, but not impossible either. The varying structure of the URLs complicates the task, e.g. the same URL might be stored either as "youtube.com" or "www.youtube.com", therefore, we cannot simply compare the two strings like we would compare two digits. Instead, we first separate all chains of consequent letters, a-z or A-Z, using regular expression methods in Python. Then, we remove "www", "http", and "https" from these lists. Finally, we find URLs for which lists of extracted words are the same, these URLs are duplicates. For instance, URLs "www.youtube.com" and "https://www.youtube.com" would produce the same lists: ("youtube", "com"), which classifies them as duplicates. Once we find the duplicates, we delete all but the most recent one.

Next, we delete all URLs that lead to non-English web pages. Our reasoning behind this step is simple - we aim to record the quantity of information disclosed using English Environmental Words. However, counting these words in non-English web pages would produce false results. To do this, we separate our websites into two groups: English domain websites and non-English domain websites. These two groups can be identified by the domain extension. English domain websites end with ".com", ".co.uk", ".eu", ".au" and so on. Non-English domain websites end with all other extensions. Then we look at language codes, which are often included in the URL, such as "en" for English, "it" for Italian, or "es" for Spanish. Among the English domain websites, we delete all URLs that contain a non-English language code, whereas among the non-English domain websites, we only keep the URLs that contain the English language code "en". Additionally, we delete web pages that are linked with news articles. Pages containing news are more likely

to exhibit changes not related to company policy, and any Environmental Words found in these pages are also likely to be irrelevant to company policy. Therefore, we deleted web pages that had the words “news”, “media”, “press”, and “magazine” in their URLs.

In the next step of our filtering process, we narrow our focus down to web pages that contain information related to environmental claims. This step is necessary for two reasons. First, having a narrower focus allows us to cover more company websites because we have to examine less URLs, which means less computing power. On average, each company has a couple hundred unique web pages stored in the relevant time periods, however, only about 30 of these web pages contain environmental information. Focusing on environmental web pages significantly reduces the computing resources necessary to collect the data given our resource constraints. Second, focusing on environmental web pages reduces the likelihood that we will record false positive results. Environmental words are most likely to refer to environmental claims in the right context, thus, if we look at the website as a whole, we expose our data to accuracy risks that cannot be easily solved without more advanced methods.

Ultimately, we retain web pages that contain environmental information. We achieve this by implementing the aforementioned set of Environmental Words - we select only those URLs that contain at least one word from the set (Appendix B). The result is a list of URLs for the before-event and after-event periods for all companies in our sample. This list represents the parts of the websites that we want to further examine.

3.2.4. Examining URLs and quantifying disclosure on the Consumer Channel

Having extracted and filtered company URLs, we access each individual URL to count the number of Environmental Words (the same list as used for URL filtering; Appendix B) and to quantify changes in company environmental disclosure. There are multiple options for doing so, both in terms of which URLs we select and how we measure the change in disclosure.

First, we select those Environmental URLs that are present in both periods: before and after the GCD announcement. Our aim with this approach is to minimise false positives. Alternatively, we could have examined all Environmental URLs in both periods. This approach would show absolute changes in the number of Environmental Words, which would encompass deleted web pages or other changes in the website's structure. However, a positive or a negative change with this approach is ambiguous. A

move in either direction can be caused either because the Internet Archive's records are incomplete or because the company has changed the structure of their website without changing the content, e.g., drop-down menus could have been originally coded as separate pages and later changed to a single dynamic page, which artificially decreases the word count. Selecting those Environmental URLs that are present in both periods fixes this problem because we know that we are observing changes in the content of those specific pages.

Another issue that we encountered when deciding on the appropriate method for quantifying disclosure was whether we should use the current, online versions for after-event web pages or opt for the records available on the archive. Using online web pages would allow us to get the true full picture, because all online pages are available by definition. However, the content on many web pages is generated using JavaScript, which makes web scraping problematic. We adopted the web scraping method used by Boulland et al. (2021), which uses a GET request to retrieve the content available on the web page, which is then dissected into useful bits using Python's BeautifulSoup library. This approach does not work on JavaScript generated content, because in this case content is generated when the web page is being interacted with. A GET request does not interact with the web page, hence no content is generated. We tried using Selenium's chromedriver as a workaround for this issue. The chromedriver imitates accessing web pages like a human user would, which allows JavaScript to generate the web pages' content. Unfortunately, this approach is too slow - we estimated that it would take more than 400 days of non-stop computing time (using resources available to us) to analyse our sample in this way. The Internet Archive's records are stored after JavaScript has generated the web pages' content; thus, this content can be accessed with a GET request.

Finally, we extract words from the web pages that we have selected for each company. We access each URL separately, and we artificially include a 1-second pause between each request to avoid having our requests denied due to safety concerns. After extracting the visible text from a web page using BeautifulSoup, we iterate through each word from our Environmental Words list, and if it is found in the text, then we add 1 to the count of words and delete it from the text. Only when all instances of an environmental word are exhausted from the text, do we move to the next word. This process is repeated for all URLs in both before-event and after-event periods, which yields the count of Environmental Words for each company before and after GCD.

Absolute differences in Environmental Words can be misleading because they do not consider the relative size of the change. Therefore, we calculate the change in Environmental Words as a percentage (Equation 1). We also omit all companies with 0 or 1 Environmental Words detected in any of the two periods. We do this to reduce the possibility of large changes in the quantified disclosure level due to lack of records. To ensure the reliability of our analysis, we address extreme outliers by removing one outlier reporting a 230% increase and winsorizing the Env Words Change metric at the 1st and 99th percentiles.

$$Env\ Words\ Change_{\ i} = \frac{Env\ Words\ 2023_{\ i} - Env\ Words\ 2022_{\ i}}{Env\ Words\ 2022_{\ i}} \quad (1)$$

Where Env Words 2023 and Env Words 2022 denote the number of Environmental Words across all environmental URLs of company *i* in the after-event period in 2023 and in the before-event period in 2022, respectively.

Subsequently, we standardise the calculated changes to establish a relative greenhushing measure for each company (Equation 2).

$$GH\ Consumer_{\ i} = \frac{Env\ Words\ Change_{\ i} - mean\ (Env\ Words\ Change_{\ i})}{sd\ (Env\ Words\ Change_{\ i})} \quad (2)$$

Where Env Words Change denotes the percentage change in the number of Environmental Words across company *i* 's web pages, mean and sd refer to the average and standard deviation of the respective variable.

3.3. Investor Channel

We use Bloomberg's BESG Environmental Pillar Disclosure Scores from Q3 2022 and Q3 2023 to measure changes in environmental disclosures related to the GCD within the Investor Channel as these quarterly scores represent the most recent data available. The Environmental Pillar Disclosure Score measures companies' disclosures on the environmental pillar in accordance with Bloomberg's materiality criteria. It ranges from 0 to 1 in 0.01 increments, with higher scores indicating a higher amount of disclosure. We calculate the change in the disclosure score between 2023 and 2022

(Disclosure Change) using Equation 3. To account for severe outliers, we are winsorizing the Disclosure Change metric at the 1st and 99th percentiles.

$$Disclosure\ Change_{\ i} = Disclosure\ 2023_{\ i} - Disclosure\ 2022_{\ i} \quad (3)$$

Where Disclosure 2023 and Disclosure 2022 denote the Bloomberg BESG Environmental Pillar Disclosure Score of company *i* by the end of Q3 2023 and Q3 2022, respectively.

The presence of a negative score signifies a decline in the company's environmental disclosure from the third quarter of 2022 to the third quarter of 2023, while a positive score suggests a rise in environmental disclosure during the same period. To facilitate comparison and utilization of the scores, we standardise them by centering around the mean and dividing them by the standard deviation, as shown in Equation 4.

$$GH\ Investor_{\ i} = \frac{Disclosure\ Change_{\ i} - mean(Disclosure\ Change_{\ i})}{sd(Disclosure\ Change_{\ i})} \quad (4)$$

Where Disclosure Change denotes the absolute change in the Bloomberg BESG Environmental Pillar Disclosure Score of company *i*, mean and sd refer to the average and standard deviation of the respective variable.

3.4. Greenwashing score

Greenwashing, within the scope of our study, is defined as deceptive disclosure within the environmental domain, where companies may strive to present themselves as environmentally responsible by disclosing extensive environmental data while underperforming in actual environmental practices (Yu et al., 2020; Marquis et al., 2016). We utilise the methodology proposed by Yu et al. (2020) to compute the Greenwashing Score in our research, while also rectifying certain criticisms directed at their method. Our approach centres on applying the industry mean and standard deviation to standardise both environmental disclosure and performance scores (Di and Li, 2023; Li and Zheng, 2024). This normalisation allows for cross-industry comparison while accounting for variances in disclosure norms and measures among industries. By doing so, we avoid the pitfalls of partial normalisation by subtracting the industry mean from the normalised scores and further standardising them by the industry standard deviation.

In order to calculate the Greenwashing Scores, we use data obtained from Bloomberg. We employ two specific metrics: the Environmental Pillar Disclosure Score for 2022 and the Environmental Pillar Score for 2022. The Environmental Pillar Disclosure Score measures companies' disclosure on the environmental pillar in accordance with Bloomberg's materiality criteria. It ranges from 0 to 1 in 0.01 increments, with higher scores indicating a higher amount of disclosure. The Environmental Pillar Score evaluates the overall environmental performance of companies in accordance with Bloomberg's materiality frameworks. It ranges from 0 to 10 in 0.01 increments, with higher scores indicating better environmental performance.

To assure cross-sector comparability, we normalise the scores using the mean and standard deviation of the industry. We calculate the normalised score GW Score for each company i within sector j as depicted in Equation 5. To address outliers, similar to the previous metrics, we are applying winsorization to the GW Score metric at the 1st and 99th percentiles.

$$GW\ Score_{\ i} = \frac{Disclosure\ 2022_{\ i,j} - mean\ (Disclsoure\ 2022_{\ j})}{st(Disclsoure\ 2022_{\ j})} - \frac{Performance\ 2022_{\ i,j} - mean\ (Performance\ 2022_{\ j})}{st(Performance\ 2022_{\ j})} \quad (5)$$

Where Disclosure 2022 denotes the Bloomberg BESG Environmental Pillar Disclosure Score of the company *i* in industry *j*, Disclosure 2022 denotes the Bloomberg BESG Environmental Pillar Score of the company *i* in industry *j*, mean and sd refer to the average and standard deviation of the respective variable.

We construct the scores based on the entire sample of 917 companies, after excluding the financial sector and removing companies for whom scores were missing. We opt to use this method rather than computing the Greenwashing Score on the reduced sample after accounting for missing observations in other variables. Through this approach, we retain the greatest number of observations, resulting in more precise inter-industry variability along with a more accurate peer-relative score.

3.5. Regression analysis

We employ an Ordinary Least Square (OLS) regression analysis to determine whether the greenhushing behaviour of companies in response to GCD is determined by their previous greenwashing practices. We use the Greenwashing Score as the primary independent variable to evaluate the effectiveness of GCD in addressing the issue of greenwashing. The concept of greenwashers refers to firms that fail to align their actions with their stated intentions. Thus, we investigate whether the GCD helps to reduce the misleading practices of greenwashers or, on the contrary, deters companies from making environmental disclosures for any other reason. In particular, since we have two distinct greenhushing scores—one for the Investor Channel and the other for the Consumer Channel—we conduct parallel regression analyses in separate models using each greenhushing score as the dependent variable. Further, to enhance our understanding of the relationship between greenwashing and greenhushing behaviours, we include corporate governance indicators in our model as they impact the environmental disclosure practices of companies (Ginnarakis et al., 2019). Lastly, we control for a range of company characteristics, including size, industry, and financial performance.

The authority to determine environmental disclosure matters resides primarily with the corporate board of directors, rendering them a decisive body in this regard. Thus, the structural characteristics of the board may impact the levels of ESG-related corporate discourse. Previous studies have identified the following corporate governance factors as having the greatest influence on sustainability disclosures: board independence, gender diversity of the board, and the presence of a sustainability or corporate social responsibility (CSR) committee (Liao et al., 2015).

Corporate governance enacted by the board of directors protects shareholders against management's opportunistic and self-interested behaviours, ensuring that stakeholders' interests are considered. Hence, board independence is regarded favourably because directors lack substantial financial stakes in the company, do not have close ties with the CEO, and are not in collusion with management regarding decision-making processes. This impartiality enables independent directors to consider the broader objectives of all stakeholder groups (Michelon and Parbonetti, 2012). The argument and empirical findings of Liao et al. (2015) indicate that an increased percentage of independent directors on the board leads to more extensive environmental disclosure. To capture board independence, we use Bloomberg's Percent Independent Directors Field Score, which is the percentage of independent directors on a company's board. It ranges

from 0 to 10 (where 10 is best), as Bloomberg uses a scoring model to transform this percentage into a relative measure of board independence, considering norms and best practices and allowing for easier comparison across companies.

It is believed that the board's socio-cultural diversity improves overall oversight and decision-making by bringing together individuals with unique perspectives, experiences, and values. An often-used approach to considering this diversity is using the gender composition of the board, which is commonly represented as the proportion of female directors. This is because male and female directors typically possess distinct problem-solving approaches, perspectives, aptitudes, and communication styles. Beyond that, previous research has indicated that women place greater importance and focus on sustainability-related elements of the organisation, which consequently increases the likelihood that the company will disclose more environmental data (Liao et al., 2015; Galbreath, 2011). We use Bloomberg's reported Percent Board Members That Are Women metric, which represents the proportion of female directors on the board. We convert it from its original percentage format to decimals to put it on the same scale as the other variables.

Environmental disclosure is likely to be significantly encouraged by the presence of an environmental committee within the organisation. It is a specific committee within the board that holds the responsibility for establishing policies and disclosures, in addition to supervising and executing environmental initiatives. Environmental data collection, processing, and reporting are also within the scope of the environmental committee (Michelon and Parbonetti, 2012). Hence, the existence of an environmental committee has been associated with increased levels of environmental disclosure (Liao et al., 2015). We use the CSR or Environmental Committee field from Bloomberg, which returns 1 if the company has a committee in charge of CSR, sustainability, or other related activities, and 0 otherwise.

We incorporate the following control variables into the regression model: the industry in which the firm operates, the index to which it belongs (indicating the company's origin: US or EU), and the natural logarithm of its revenues and return on assets for 2022, which was extracted from the Bloomberg Terminal database. The complete regression model is represented by equation 6.

$$GH\ (Investor/Consumer)_i = \beta_0 + \beta_1 * GW\ Score_{\ i} + \beta_2 * Index_{\ i} + \beta_3 * Indep\ BoD\ Score_{\ i} + \beta_4 * Woman\ BoD_{\ i} + \beta_5 * CSR_{\ i} + \beta_6 * Revenue_{\ i} + \beta_7 * ROA_{\ i} + \beta_8 * Sector_{\ i} \quad (6)$$

Where *i* represents the company, and the rest of the variables are explained in Table 1.

Table 1.

Regression variable description

Variable	Description
GH Investor	Greenhushing metric for investor channel expressed as a standartised difference between disclosure scores from 2022 to 2023 (Disclosure Change)
GH Consumer	Greenhushing metric for consumer channel expressed as a standartised percent change of environmental words on companies webpages from 2022 to 2023 (Env Words Change)
GW Score	Greenwashing score expressed as a standardised industry-adjusted difference between companies' environmental disclosure and performance
Indep BoD Score	Bloomberg score indicating independence of the board of directors
Women BoD	Percentage of female board members expressed in decimals
CSR	Dummy variable equals 1 if the company has a CSR or environmental committee and 0 if otherwise
Sector	The dummy variable for GICS industry classification
Index	The dummy variable equals 1 if the firm is a member of EUROSTOXX 600 and so originates from the EU, and 0 if it is an S&P 500 constituent and originates from the US
Revenue	Natual logarithm of company's revenue in millions for the 2022
ROA	Company's Return on Assets for 2022 calculated as Net Income divided by Total Assets and expressed in decimals

Table 1 describes the variable notations used in the regression model presented in Equation 6.

3.6. Data statistics

Table 2 presents the summary of the data statistics. The final sample consists of 367 companies, which we obtain after removing incomplete observations. As seen in Panel B, a total of 203 firms are retained from the EUROSTOXX 600 index, while 164 companies are retained from the S&P 500 index. We lose a substantial number of observations due to inability to crawl the websites of numerous companies and the absence of data on environmental performance, disclosure scores, and corporate

governance metrics for some. Appendix C contains a summary table of data used for sample creation and displays the correlation matrix of the variables.

Panel A demonstrates that the mean change in environmental disclosure for both investors (Disclosure Change) and consumers (Env Words Change) is close to zero. The environmental disclosure change in the Investor Channel (Disclosure Change) has a mean of 0.01 that ranges from a minimum of -0.52, signifying a decrease in the disclosure of environmental data, to a maximum of 0.39, signifying an increase in the disclosure of environmental data. The Consumer Channel (Env Words Change) exhibits a mean value of 0.02, i.e., 2%, for environmental word change. This value suggests that, on average, the number of Environmental Words on the companies' web pages experienced no change. The variability of the percent change in the number of Environmental Words shown on the websites of companies ranges from a -69% decline to a 225% increase.

The mean value of the Greenwashing Score, which is an independent variable in our regression model, is nearly zero. The score reaches a minimum of -1.68, suggesting that the organisation possesses superior environmental performance. However, in comparison to its industry counterparts, it only discloses a limited portion of this information, which discredits the company as a greenwasher. The Greenwashing Score has a maximum value of 1.83. This indicates that the company, despite disclosing a considerable quantity of environmental information, performs below its competitors in this regard; therefore, the company may be engaging in greenwashing.

Table 2.

Descriptive statistics

Panel A: Continuous Variable Description

Statistic	N	Mean	St. Dev.	Min	Max
Dependent Variables					
URLs Accessed	367	6.15	7.42	1	51
Env Words 2022	367	124.68	211.89	2	2,645
Env Words 2023	367	123.35	212.45	2	2,655
Env Words Change	367	0.02	0.34	-0.69	2.25
GH Consumer	367	0	1	-2.06	6.57
Env Disclosure 2022	367	0.58	0.28	0	1
Env Disclosure 2023	367	0.59	0.28	0	1
Disclosure Change	367	0.01	0.07	-0.52	0.39
GH Investor	367	0	1	-7.3	5.2
Independent Variables					
Env Performance 2022	367	4.34	1.88	0	9.42
GW Score	367	0.03	0.68	-1.68	1.83
Indep BoD Score	367	7.43	2.72	1.41	10
Women BoD	367	0.35	0.09	0.11	0.58

Revenue	367	27,634.57	49,362.27	236.36	469,822.00
ROA	367	0.08	0.07	-0.24	0.59

Panel B: Factor Variable Description

		N	%
Sector	Communication Services	16	4.36
	Consumer Discretionary	40	10.9
	Consumer Staples	34	9.26
	Energy	27	7.36
	Financials	0	0
	Health Care	43	11.72
	Industrials	89	24.25
	Information Technology	29	7.9
	Materials	46	12.53
	Real Estate	14	3.81
	Utilities	29	7.9
Index	S&P 500	164	44.69
	EUROSTOXX 600	203	55.31
CSR	Not present (0)	112	30.52
	Present (1)	255	69.48

Table 2 displays the summary statistics of the data variables used in the regression (Equation 6), along with the variables used in the calculation of the Greenwashing Score and our developed greenhushing metric. The sample consists of 364 companies (N). Panel A describes the summary statistics for all continuous variables. It presents the final number of observations, mean, standard deviation, minimum, and maximum values for each variable. URLs Accessed shows the number of Environmental URLs we could access and subsequently analyze for each company in both periods before and after the GCD announcement. Env Words 2022 and Env Words 2023 denote the number of Environmental Words (as per Baier et al. (2020) ESG Dictionary) on all companies' Environmental URLs before and after GCD, respectively. Env Words Change shows the change in Environmental Words before and after GCD (Equation 1) expressed in decimals. GH Consumer is the standardised Env Words Change metric. Env Disclosure 2022 and Env Disclosure 2023 show the BESG Environmental Pillar Disclosure Score for Q3 2022 and Q3 2023, respectively. Disclosure Change shows the change in Bloomberg BESG Environmental Pillar Disclosure from Q3 2022 to Q3 2023 (Equation 3). GH Investor is the standardised metric of Disclosure Change. Env Performance is the Bloomberg BESG Environmental Pillar score for 2022. GW Score is the Greenwashing Score calculated for each company based on the difference between environmental disclosure and performance (as per Yu et al., (2020) methodology) (Equation 5). Indep BoD Score is the Bloomberg score assessing the share of independent directors on a board. Women BoD is the share of women on board expressed in decimals. Revenue shows companies' revenue for 2022, and ROA shows return on assets in decimals. Env Words Change, Disclosure Change, and GW Score are winsorised at 1st and 99th percentiles. Panel B provides a summary for each category of factor variables presenting the number of observations and the percentage they represent within the sample. It depicts the quantitative breakdown of companies by GICS Sector, Index, and the presence of CSR or Environmental Committee.

4. Analysis of results

To answer our research questions, we run two independent regression panels with the model specified in Equation 6. Specifically, we want to know if the introduction of GCD causes firms to reduce their greenwashing tactics (RQ1), and if so, which

environmental communication channels companies use to reduce their greenwashing practices - investor or consumer-facing channels (RQ2). We employ different greenhushing measures for each set of regressions to separate the greenhushing practices in the Investor and Consumer Channels. First, we analyse the Consumer Channel, using the GH Consumer measure, which is based on changes in environmental disclosure on company websites. For the second set of regressions, as an independent variable, we use the GH Investor measure, which is based on changes in the Bloomberg Environmental Pillar Disclosure score.

Table 3.1.

Consumer Channel greenhushing regression results

Dependent Variable	**GH Consumer**			
	(1)	(2)	(3)	(4)
GW Score	-0.036	-0.038	-0.04	-0.069
	(0.08)	(0.08)	(0.08)	(0.08)
Index (EUROSTOXX 600)		-0.027	-0.02	-0.072
		(0.11)	(0.14)	(0.15)
Indep Dir Score			-0.009	-0.007
			(0.02)	(0.02)
Women on BoD			-0.725	-0.809
			(0.63)	(0.66)
CSR (1)			-0.028	-0.005
			(0.12)	(0.13)
log(Revenue)				-0.028
				(0.04)
ROA				-1.859**
				(0.79)
Sector Consumer Discretionary				0.36
				(0.30)
Sector Consumer Staples				0.08
				(0.31)
Sector Energy				(0.12)
				(0.32)
Sector Health Care				0.10
				(0.30)
Sector Industrials				0.19
				(0.28)
Sector Information Technology				0.02
				(0.32)
Sector Materials				0.20
				(0.29)
Sector Real Estate				0.32
				(0.38)

Sector Utilities				(0.15) (0.32)
Constant	0.001 (0.05)	0.016 (0.08)	0.354 (0.32)	0.665 (0.59)
Observations	367	367	367	367
R2	0.001	0.001	0.005	0.04
Adjusted R2	-0.002	-0.005	-0.008	-0.004
Residual Std. Error	1.001 (df = 365)	1.002 (df = 364)	1.004 (df = 361)	1.002 (df = 350)
F Statistic	0.220 (df = 1; 365)	0.142 (df = 2; 364)	0.392 (df = 5; 361)	0.906 (df = 16; 350)

Table 3.1 reports the Ordinary Least Squares (OLS) regression results (Equation 6) of our Greenhushing in Consumer Channel metric (GH Consumer) that is based on environmental word changes on companies' web pages on the Greenwashing Score (GW Score), dummy variable for index membership that equals 1 for companies within EUROSTOXX 600 (Index EUROSTOXX 600), independent director score (Indep BoD Score), the share of women on board (Women BoD), a dummy variable for CSR committee that equals 1 if such is present. The natural logarithm of revenues (log(Revenue)), return on assets (ROA), and sector dummies are used as control variables in the model. The total number of observations is 364. Standard errors are shown in parenthesis below the corresponding coefficient. 0.1 0.05, and 0.01 significance levels are represented by *, **, and ***, respectively.

The results of the regression analysis, which are presented in Table 3.1, indicate that there is no statistically significant negative relationship between the Greenwashing Score (GW Score) and greenhushing practices in the Consumer Channel (GH Consumer) across all models. All of the models' coefficients fall below the traditional significance thresholds. This indicates that the tendency to diminish the environmental content of consumer-facing web pages in response to GCD is unrelated to greenwashing practices.

Furthermore, in Models (2) through (4), the dummy variable Index, which represents the EUROSTOXX 600 index, did not exhibit a statistically significant association with greenhushing practices in the Consumer Channel (GH Consumer). Even though, membership in the EUROSTOXX 600 index indicates that the organisation is established in the European Union and is, therefore, directly impacted by GCD.

Based on the results, it can be concluded that neither previous involvement in greenwashing nor membership in the EUROSTOXX 600 index, which indicates EU domicile, appear to have a significant impact on the extent of greenhushing practices directed at consumers.

Moreover, across Models (3) and (4), the incorporation of board independence (Indep BoD Score), the percentage of women on the board (Women BoD), and the existence of a CSR or Environmental Committee (CSR (1)) did not result in statistically significant coefficients. This implies that the impact of corporate governance factors on the greenhushing strategies of companies regarding consumers may not be substantive.

No statistically significant relationships were observed between any of the sector dummy variables and GH Consumer across all models. The p-values for all regression models were greater than the conventional significance threshold of 0.05. In the context of consumer-related greenwashing behaviour, involvement in particular industry sectors do not appear to have a discernible impact on the disclosure strategies of companies that target consumers.

The Return on Assets (ROA) and GH Consumer exhibited a statistically significant positive relationship, according to the Model (4). The estimated coefficient is -1.859, along with standard error of 0.79. Accounting for the 0.34 standard deviation of the underlying metric Env Words Change, which lies underneath the GH Consumer, the -1.859 coefficient translates into a 0.065 or 6.5% change in the number of Environmental Words per 1 unit or 100% Return on Assets growth.

According to these results, more profitable businesses – those with greater Returmn on Assets —tend to decrease their environmental communication to consumers. Despite the fact that profitability may influence consumer-related greenwashing behaviour to some degree, it is likely that other factors have a greater impact on the formation of such strategies, as indicated by the remaining statistical significance of the constant. There were no statistically significant relationships observed between revenue (Revenue) and the GH Consumer metric across all models.

The regression model R-squared values varied between 0.001 and 0.04, indicating that they were of negligible capability to explain fluctuations in greenhushing practices within consumer-facing channels. This suggests that the factors used in our analysis have little effect on the overall variance in consumer-targeted greenhushing behaviour of the companies. It is probable that there are other unconsidered variables that impact the greenhushing practices of companies.

Although we had foreseen that companies are less likely to alter their environmental disclosures on consumer-facing communication channels (H2), our prior literature review has led us to a few theories that may account for this behaviour.

It is plausible that although we have not detected any significant decline in the usage of Environmental Words across corporate websites, organisations might have modified the information conveyed by these words. This theory is consistent with the previous findings of Robinson et al. (2023), which propose that when companies are confronted with an increased risk of litigation regarding sustainability practices, they

transition from making assertive and factual claims to making broader forward-looking statements and promises. Thus, leaving the overall environmental word count unaffected.

Another possible explanation is that for most companies environmental disclosure on consumer-facing channels is merely boilerplate text that must be included due to public relations. Zheng et al. (2023) found that firms in China release CSR reports that follow a boilerplate because of the "minimum-requirement" orientation. The regulatory environment in China is different than in Europe, which means that these findings are not applicable to CSR reports in Europe. However, the notion of "minimum-requirement" boilerplate disclosure can be applicable to corporate websites in Europe. Environmental disclosure on consumer-facing channels might serve a public relations function, which concerns general status-quo statements, e.g., no Oil & Gas company would ever state that they do not want a sustainable future on their website. This would also mean that the GCD has no effect on the boilerplate disclosure, hence it does not affect the overall word count.

Finally, it could be that consumers do not pose a serious litigation risk; thus, companies are not altering their disclosure in consumer-facing channels. The lack of litigation risk also means that companies' potential benefit from keeping their false claims in the consumer-facing channels outweighs the potential cost. As outlined by Morrison (1991), consumers struggle to go to court with large companies because of the small damages that they are entitled to, which is especially true in fast-moving consumer goods businesses. According to Morrison (1991), the only viable option for consumers is to agglomerate together in a class action lawsuit, which is a complex process. On the other hand, companies can sell more products by creating a sustainable perception of them (Marquis and Toffel, 2016; Musgrove et al., 2023). Therefore, it could be that companies deliberately choose to keep their unfounded environmental claims on consumer-focused channels, despite the GCD.

Table 3.2.

Investor Channel greenhushing regression results

Dependent Variable	**GH Investor**			
	(1)	(2)	(3)	(4)
GW Score	-0.192**	-0.193**	-0.200***	-0.202***
	(0.08)	(0.08)	(0.08)	(0.08)
Index (EUROSTOXX 600)		-0.005	0.11	0.078
		(0.11)	(0.14)	(0.14)
Indep Dir Score			0.01	0.002

			(0.02)	(0.02)
Women on BoD			-0.642	-0.657
			(0.63)	(0.64)
CSR (1)			0.147	0.205*
			(0.12)	(0.12)
log(Revenue)				-0.019
				(0.04)
ROA				-0.296
				(0.77)
Sector Consumer Discretionary				0.786***
				(0.29)
Sector Consumer Staples				1.075***
				(0.30)
Sector Energy				0.598*
				(0.31)
Sector Health Care				0.713**
				(0.29)
Sector Industrials				1.109***
				(0.27)
Sector Information Technology				0.767**
				(0.31)
Sector Materials				0.702**
				(0.29)
Sector Real Estate				0.53
				(0.37)
Sector Utilities				0.42
				(0.31)
Constant	0.006	0.008	-0.008	-0.552
	(0.05)	(0.08)	(0.31)	(0.57)
Observations	367	367	367	367
R2	0.017	0.017	0.023	0.099
Adjusted R2	0.015	0.012	0.01	0.058
Residual Std. Error	0.993 (df = 365)	0.994 (df = 364)	0.995 (df = 361)	0.971 (df = 350)
F Statistic	6.414** (df = 1; 365)	3.200** (df = 2; 364)	1.734 (df = 5; 361)	2.397*** (df = 16; 350)

Table 3.2 reports the Ordinary Least Squares (OLS) regression results (Equation 6) of our Greenhushing in Investor Channel metric (GH Investor) that is based on environmental word changes on companies' web pages on the Greenwashing Score (GW Score), dummy variable for index membership that equals 1 for companies within EUROSTOXX 600 (Index EUROSTOXX 600), independent director score (Indep BoD Score), the share of women on board (Women BoD), a dummy variable for CSR committee that equals 1 if such is present. The natural logarithm of revenues (log(Revenue)), return on assets (ROA), and sector dummies are used as control variables in the model. The total number of observations is 364. Standard errors are shown in parenthesis below the corresponding coefficient. 0.1 0.05, and 0.01 significance levels are represented by *, **, and ***, respectively.

Subsequently, we perform a similar OLS regression using the independent variable GH Investor. This variable represents the standardised difference in environmental disclosure scores between companies as reported by Bloomberg. Positive values indicate an increase in disclosure, while negative values indicate a decrease.

The results of the regression analysis show several significant findings. The Greenwashing Score (GW Score) and the Greenhushing in Investor Channel Measure (GH Investor) show a statistically significant negative relationship at the 0.05 significance level, according to Models (1) and (2), and at the 0.01 significance level, according to Models (3) and (4). Specifically, an increase of one unit in the GW Score corresponds to a decline of GH Investor by an estimated -0.192 to -0.202 standard deviations. Given the 0.07 standard deviation of the underlying Disclosure Change metric, obtained coefficients translate into approximately -0.014 reduction in the Bloomberg Environmental Pillar Disclosure Score that originally ranges from 0 to 1. This suggests that companies that demonstrate greater degrees of greenwashing, which is defined as exaggerated or misleading environmental disclosures, have a tendency to be involved in greenhushing activities within the Investor Channel. The finding suggests that companies that practiced greenwashing withheld their environmental disclosures and reporting over 2023 resulting in a decrease in Bloomberg Environmental Pillar Disclosure Score. This situation exemplifies how companies may attempt to mitigate the perception of greenwashing by diminishing the disclosure of environmental information that fails to reflect their true environmental performance.

Of particular interest is the non-significant effect observed between the EUROSTOXX 600 index and the greenhushing behaviour in the Investor Channel (GH Investor) in Models (2) and onwards. This shows that the choice to greenhush or not is independent of the index to which the firm belongs. In the case of our research, this suggests that greenhushing occurs regardless of the company's location, implying that S&P 500 companies located in the US are likewise subject to GCD regulation and hence have an incentive to comply.

The inclusion of board independence (Indep BoD Score) in Models (3) fails to yield statistically significant coefficients, suggesting that variations in the level of board independence do not exert a discernible influence on GH Investor. Similarly, nor the proportion of women on the board (Women BoD) demonstrates statistically significant relationships with GH Investor. This suggests that similar to the findings concerning greenhushing practices within consumer-facing channels, corporate governance factors may not exert significant influence over companies' disclosure strategies with regards to decision whether to greenhush or not, contrary to expectations derived from prior literature. However, Model (4) demonstrates a positive link with CSR or Environmental Committee (CSR (1)) and greenhushing in investor-facing channels (GH Investor) at a

0.1 significance level. The coefficient reports 0.205 standard deviations increase of the Disclosure Change metric, resulting in a 0.014 point increase in the Bloomberg Environmental Pillar Disclosure Score for companies with a CSR or Environmental Committee, indicating that they have increased their environmental disclosures.

There exists a statistically significant relationship between certain control variables linked to sector dummies and the greenhushing behaviour observed in the Investor Channel. The regression model presented in Table 3.2 indicates that companies that belong to Consumer Discretionary, Consumer Staples, Energy, Health Care, Industrials, Information Technology, and Materials have not participated in greenhushing. Even so, they have significantly increased the quantity of environmental communications they publish through the Investor Channel as compared to companies in the Communication Services sector, as measured by Bloomberg Environmental Pillar Disclosure Scores.

The control variables encompassing financial performance metrics do not exhibit statistically significant associations with GH Investor across all models. This suggests that factors such as revenue size and return on assets do not significantly influence the propensity of companies to engage in greenhushing behavior within the Investor Channel.

Furthermore, the R-squared values for the regression models range from 0.017 to 0.099, indicating that the explanatory power of the models in predicting variations in GH Investor is relatively low. This suggests that while the included variables collectively contribute to explaining some of the variability in greenhushing behavior, there likely exist additional unaccounted-for factors that influence companies' disclosure practices within the Investor Channel.

5. Discussion

Table 4 presents the summary of our research question findings. Both our hypotheses were approved. In addition to providing academics with a foundation for future research, our findings provide policymakers and practitioners with vital insights regarding the environmental disclosure practices of companies.

First, the finding that the introduction of the GCD did not lead to a significant reduction in greenwashing practices targeted at consumers suggests that regulatory interventions may not always effectively curb deceptive environmental communication as desired. According to our results, GCD is not effective in forcing companies to adjust their consumer-facing channels because consumers do not pose a significant litigation

risk. It allows companies to freely experiment with different solutions such as changing their statements from backward-looking to forward-looking or sticking with boilerplate disclosure. This highlights the need for policymakers to carefully develop the design and enforcement mechanisms of such regulations to ensure their effectiveness in addressing greenwashing. Our proposition is forcing companies to report their peer-relative environmental performance score on the products that they sell. This would effectively create a business risk for B2C companies that perform poorly, as customers could opt for greener alternatives. Additionally, it would create incentives among the companies to become more sustainable.

Second, the observed negative relationship between the Greenwashing Score and greenhushing practices in the Investor Channel indicates that companies engaging in greenwashing are more likely to decrease their environmental disclosures directed at investors within more complex environmental disclosure reports and filings in response to regulatory pressure. We believe that one of the reasons for such activity could be companies' intention not to be viewed as greenwashers. Investors may look at the gap between environmental performance and disclosure scores as a proxy for greenwashing. Thus, if the company is aware that its scores have a substantial gap, higher than those of its peers, it may choose to reduce the disclosure score in order to narrow that gap, as this alternative is faster and easier than increasing the performance score. This highlights the power of investor scrutiny for companies' actual sustainability and greenwashing practices.

Furthermore, the lack of significant relationship between the EUROSTOXX 600 and greenhushing in the Investor Channel implies that the impact of regulatory measures such as the GCD affects not only EU companies, but also the largest US companies selling to the EU. On the other hand, the non-significant influence of the company's origin could indicate that the choice to greenhush was caused by either external or internal factors unrelated to the GCD that pushed companies to cease their greenwashing practices.

Table 4.

Summary of research questions and hypotheses

Research Question	**Hypothesis**	**Result**

RQ1: To what extent does the implementation of the Green Claims Directive (GCD) contribute to reducing greenwashing practices, i.e., greenhushing, by companies?	**H1:** Companies that have engaged in greenwashing in the past are more likely to employ greenhushing techniques to conceal their previous deceptive actions to avoid the legal risks posed by GCD.	Yes
RQ2: Within which communication channels—investor or consumer—does the Green Claims Directive (GCD) demonstrate effectiveness in curbing greenwashing practices by companies?	**H2:** In response to GCD, companies will adjust their environmental disclosures in investor-facing communication channels.	Yes

Table 4 summarises the study findings. It includes our research questions, hypotheses, and outcomes that indicate whether or not the hypotheses were validated.

6. Conclusion

Based on our regression analysis aimed at determining the effectiveness of the Green Claims Directive (GCD) in reducing greenwashing in company disclosure channels, we have made several significant findings regarding greenhushing practices in both Investor and Consumer Channels.

In the Consumer Channel, our results indicate that there is no statistically significant relationship between the Greenwashing Score and greenhushing practices (GH Consumer), suggesting that companies' tendencies to diminish environmental content on consumer-facing web pages are unrelated to greenwashing practices. Similarly, factors such as membership in the EUROSTOXX 600 index, signifying that the company's origin is within the EU, board independence, and industry sectors do not appear to exert substantial influence on consumer-targeted greenhushing behaviour. However, we find a statistically significant negative relationship between profitability and environmental communication to consumers, indicating that more profitable businesses tend to decrease their environmental communication in Consumer Channels.

In contrast, within the Investor Channel, we observe a significant negative relationship between the GW Score and the Greenhushing in Investor Channel Measure (GH Investor), suggesting that companies involved in greenwashing tend to engage in greenhushing activities within the Investor Channel. Moreover, the lack of significance observed in the relationship between the EUROSTOXX 600 and greenhushing in the Investor Channel indicates that regulatory interventions such as the GCD have effects not only on the EU companies, but also on the largest US companies that sell to the EU as well. However, corporate governance factors such as board independence and the

presence of dedicated sustainability committees do not appear to significantly influence greenhushing behaviour in the Investor Channel.

Our findings contribute to the understanding of how companies strategically communicate their environmental efforts to both investors and consumers, in the context of GCD effectiveness. We highlight the differences in greenhushing behaviour across different communication channels and shed light on the factors that may influence these practices. These insights have implications for policymakers, investors, and corporate decision-makers, informing their understanding of corporate environmental communication strategies and the complexities involved in mitigating greenwashing. Further research could explore additional factors influencing greenhushing behavior and investigate how companies' communication strategies evolve over time in response to changing regulatory landscapes and stakeholder demands.

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Finally, we acknowledge the contribution of Artificial Intelligence (AI) in the development of this thesis. AI played a role in the development of R and Python code for web scraping, data transformations and regressions, as well as in refining some of the language used throughout the thesis.

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Appendix A

Figure 1.1.

Example of Sweco's "Sustainability" section of the web page in December 2022

Source:
https://web.archive.org/web/20221220234721/https://www.swecogroup.com/sustainability/water-energy-and-industry/

Figure 1.2.

Example of Sweco's "Sustainability" section of the web page in July 2023

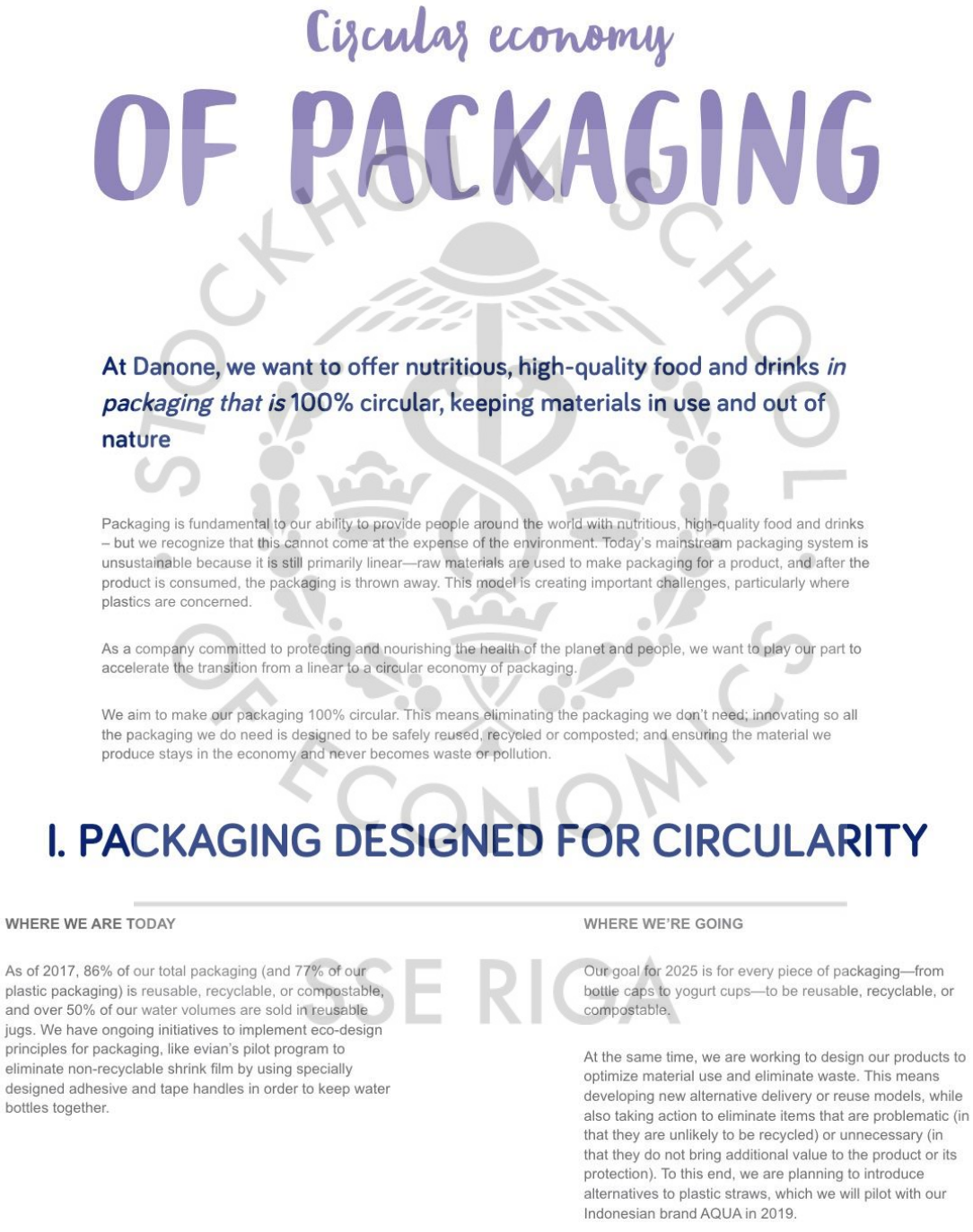
Source:
https://web.archive.org/web/20230605170418/https://www.swecogroup.com/sustainability/water-energy-and-industry/

Figures 1.1. and 1.2. show the changes made between the December 2022 and July 2023 to the Sweco website. This exemplifies how the company modified its previous environmental claims with generic and forward-looking statements.

Figure 2.1.

Example of Danone's "Packaging" section of the web page in October 2022

Source:
https://web.archive.org/web/20221018201912/https://www.danone.com/impact/planet/packaging-positive-circular-economy.html



Circular economy

OF PACKAGING

At Danone, we want to offer nutritious, high-quality food and drinks *in packaging that is* 100% circular, keeping materials in use and out of nature

Packaging is fundamental to our ability to provide people around the world with nutritious, high-quality food and drinks – but we recognize that this cannot come at the expense of the environment. Today's mainstream packaging system is unsustainable because it is still primarily linear—raw materials are used to make packaging for a product, and after the product is consumed, the packaging is thrown away. This model is creating important challenges, particularly where plastics are concerned.

As a company committed to protecting and nourishing the health of the planet and people, we want to play our part to accelerate the transition from a linear to a circular economy of packaging.

We aim to make our packaging 100% circular. This means eliminating the packaging we don't need; innovating so all the packaging we do need is designed to be safely reused, recycled or composted; and ensuring the material we produce stays in the economy and never becomes waste or pollution.

I. PACKAGING DESIGNED FOR CIRCULARITY

WHERE WE ARE TODAY

As of 2017, 86% of our total packaging (and 77% of our plastic packaging) is reusable, recyclable, or compostable, and over 50% of our water volumes are sold in reusable jugs. We have ongoing initiatives to implement eco-design principles for packaging, like evian's pilot program to eliminate non-recyclable shrink film by using specially designed adhesive and tape handles in order to keep water bottles together.

WHERE WE'RE GOING

Our goal for 2025 is for every piece of packaging—from bottle caps to yogurt cups—to be reusable, recyclable, or compostable.

At the same time, we are working to design our products to optimize material use and eliminate waste. This means developing new alternative delivery or reuse models, while also taking action to eliminate items that are problematic (in that they are unlikely to be recycled) or unnecessary (in that they do not bring additional value to the product or its protection). To this end, we are planning to introduce alternatives to plastic straws, which we will pilot with our Indonesian brand AQUA in 2019.

II. RECYCLED, REUSED, OR COMPOSTED IN PRACTICE

Redesigning packaging for circularity won't do much good if the waste management systems aren't in place to ensure it is recycled, reused or composted in practice. That's way Danone is committed to help build effective, efficient and inclusive systems for collection, reuse and recycling.

WHERE WE ARE TODAY

Today, we systematically look to collaborate with public authorities and private companies to optimize formal Extended Producer Responsibility (EPR) and Deposit Return Scheme (DRS) systems. In fact, Danone helped pioneer the concept of EPR in France with the founding of Eco-Emballages (today known as CITEO).

In countries where collection systems for recycling are informal, we work with local communities governments and partners like the Inter-American Development Bank to improve standards for waste collection and invest in recycling infrastructure. Danone and the Danone Ecosystem Fund have launched projects to support waste pickers in 7 countries, including by ensuring they work in a safe environment, are paid appropriate wages and afforded greater social protection. As of 2018, close to 6,000 waste pickers have been professionally empowered, and more than 45,000 tons of waste are recycled each year through these projects.

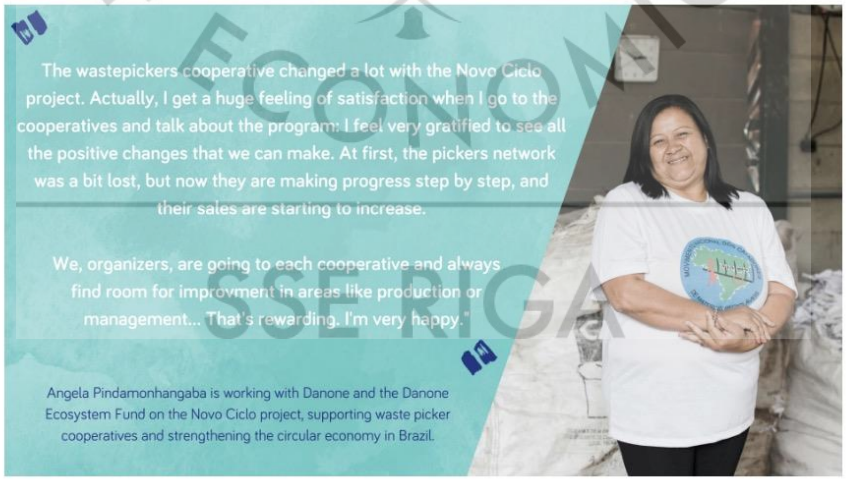
Finally, our brands have been working to engage consumers in the circular economy and support cutting edge research innovation. For instance, evian® is taking part in a research mission with The Ocean Cleanup, a Dutch non-profit start up that has developed scalable advanced technologies to help rid the oceans of plastic, while Danone AQUA has pledged to recover more plastic than it uses in Indonesia, including through interception of marine littering.

WHERE WE'RE GOING

To further, we will actively help to meet or go beyond collection targets set by regulators, like the EU's expected 2025 target of 90% collection for beverage bottles. To do this, we will support the most effective publicly organized systems, including Extended Producer Responsibility and Deposit Return Schemes.

We will also be stepping up investments in private initiatives that strengthen circular infrastructure, especially in countries that lack formal collection systems or where there is a high risk of leakage of plastic waste into the environment. We have invested over $5 million in the Closed Loop Fund, which develops large scale recycling infrastructure in the United States, and are looking to invest in similar initiatives, such as Circulate Capital in Southeast Asia.

By 2025, we will have initiated or supported initiatives collection and recycling initiatives in every one of our top 20 markets, representing around 90% of sales.



III. PRESERVATION OF NATURAL RESOURCES

Transitioning to a circular economy means seeking to no longer use packaging from finite resources. This helps preserve natural resources and keep existing materials in use and out of nature. To reduce the need for newly created material, we are working to increase recycled content. We are also developing renewable materials that further decouple packaging from natural resource use.

WHERE WE ARE TODAY

In 2017, we reached 36% recycled content on average in our packaging, including 14% recycled PET in our water and beverage bottles.

We are investing in the development and use of renewable, bio-based materials to speed up the transition away from fossil fuel plastics. Danone partnered with Nestlé Waters, PepsiCo, and Origin Materials, through the NaturAll Bottle Alliance, to introduce the first 75% bio-based bottle at commercial scale by 2021.

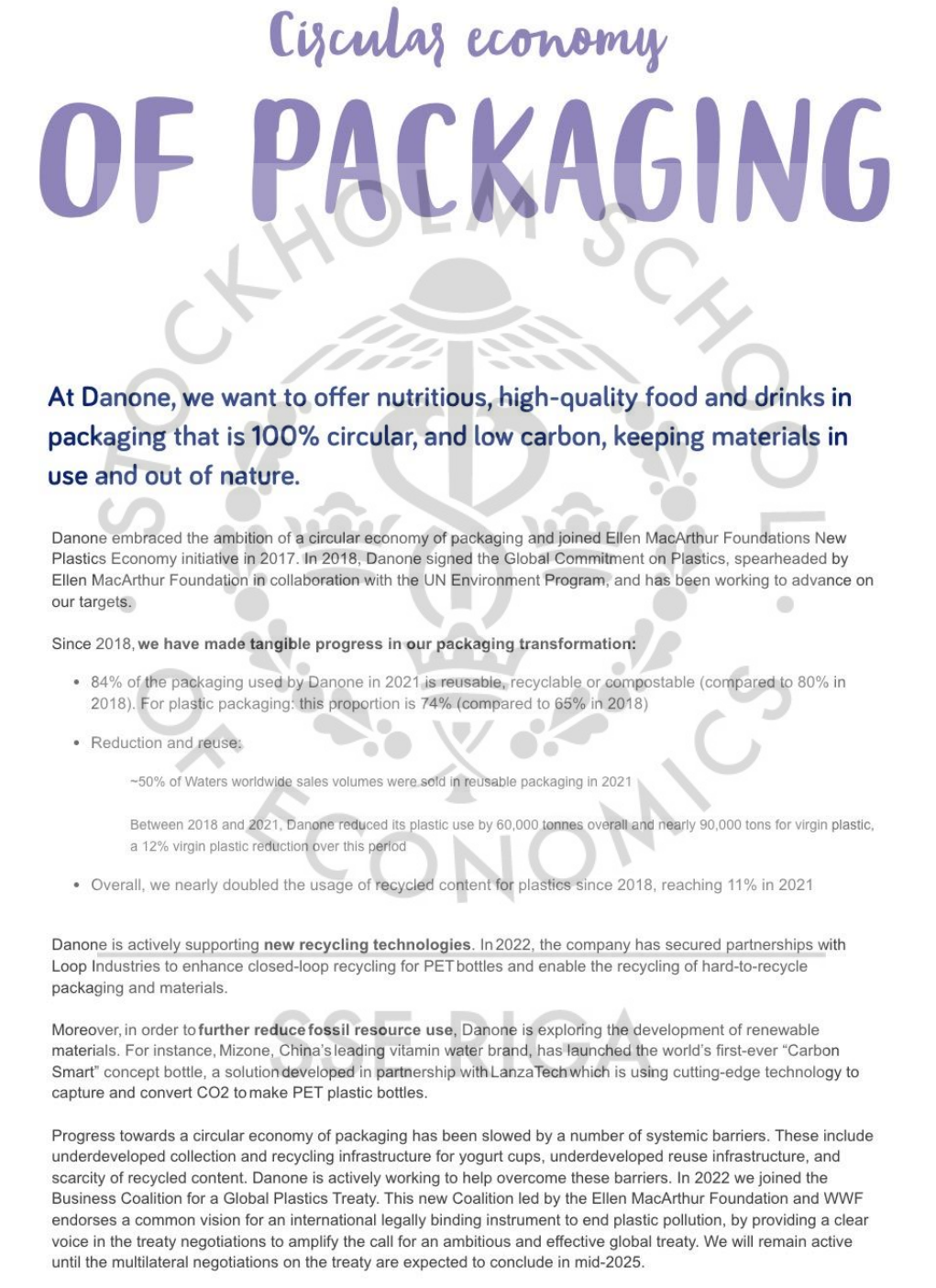
WHERE WE'RE GOING

We intend to drastically expand the amount of recycled and bio-plastic used in our packaging. By 2021, we will launch 100% recycled PET bottles in all our major water markets. By 2025, we will reach 25% of recycled material on average in our plastic packaging; 50% on average for our water and beverage bottles; and 100% for evian bottles. We will also aim to offer consumers bottles made from 100% bioplastic.

Figure 2.1.

Example of Danone's "Packaging" section of the web page in May 2023

Source:
https://web.archive.org/web/20230513221517/https://www.danone.com/impact/planet/packaging-positive-circular-economy.html



Circular economy

OF PACKAGING

At Danone, we want to offer nutritious, high-quality food and drinks in packaging that is 100% circular, and low carbon, keeping materials in use and out of nature.

Danone embraced the ambition of a circular economy of packaging and joined Ellen MacArthur Foundations New Plastics Economy initiative in 2017. In 2018, Danone signed the Global Commitment on Plastics, spearheaded by Ellen MacArthur Foundation in collaboration with the UN Environment Program, and has been working to advance on our targets.

Since 2018, **we have made tangible progress in our packaging transformation:**

- 84% of the packaging used by Danone in 2021 is reusable, recyclable or compostable (compared to 80% in 2018). For plastic packaging: this proportion is 74% (compared to 65% in 2018)
- Reduction and reuse:

  ~50% of Waters worldwide sales volumes were sold in reusable packaging in 2021

  Between 2018 and 2021, Danone reduced its plastic use by 60,000 tonnes overall and nearly 90,000 tons for virgin plastic, a 12% virgin plastic reduction over this period
- Overall, we nearly doubled the usage of recycled content for plastics since 2018, reaching 11% in 2021

Danone is actively supporting **new recycling technologies**. In 2022, the company has secured partnerships with Loop Industries to enhance closed-loop recycling for PET bottles and enable the recycling of hard-to-recycle packaging and materials.

Moreover, in order to **further reduce fossil resource use**, Danone is exploring the development of renewable materials. For instance, Mizone, China's leading vitamin water brand, has launched the world's first-ever "Carbon Smart" concept bottle, a solution developed in partnership with LanzaTech which is using cutting-edge technology to capture and convert CO2 to make PET plastic bottles.

Progress towards a circular economy of packaging has been slowed by a number of systemic barriers. These include underdeveloped collection and recycling infrastructure for yogurt cups, underdeveloped reuse infrastructure, and scarcity of recycled content. Danone is actively working to help overcome these barriers. In 2022 we joined the Business Coalition for a Global Plastics Treaty. This new Coalition led by the Ellen MacArthur Foundation and WWF endorses a common vision for an international legally binding instrument to end plastic pollution, by providing a clear voice in the treaty negotiations to amplify the call for an ambitious and effective global treaty. We will remain active until the multilateral negotiations on the treaty are expected to conclude in mid-2025.

Figures 2.1. and 2.2. show the modifications made between the October 2022 and May 2023 to the Danone website. This serves as an illustration of how the company eliminated a substantial amount of disclosures that it had previously provided related to the packaging.

Appendix B

The environmental section of the ESG Dictionary developed by Baier et al. (2020)

Topic	Category	Subcategory
Environmental: clean, environmental, epa, sustainability	**Climate change**: climate, warming	**Biofuels**: biofuels, biofuel **Climate change strategy**: green, renewable, solar, stewardship, wind **Emissions management and reporting**: emission, emissions, ghg, ghgs, greenhouse, atmosphere, emit
	Ecosystem service: agriculture, deforestation, pesticide, pesticides, wetlands	**Access to land**: zoning **Biodiversity management**: biodiversity, species, wilderness, wildlife **Water**: freshwater, groundwater, water
	Environmental management: cleaner, cleanup, coal, contamination, fossil, resource	**Pollution control**: air, carbon, nitrogen, pollution, superfund **Waste and recycling**: biphenyls, hazardous, householding, pollutants, printing, recycling, toxic, waste, wastes, weee, recycle

Appendix A contains a list of environmental words used to detect Environmental URLs and words on company websites. The list was drawn from Baier et al.'s (2020) ESG dictionary. The environmental section consists of 54 words in total.

Appendix C

Data description of variables used for sample construction

Panel A: Continuous Variable Description

Statistic	N	Mean	St. Dev.	Min	Max
Dependent Variables					
URLs Accessed	397	6.18	7.46	1	51
Env Words 2022	397	123.22	207.67	2	2,645
Env Words 2023	397	121	208.02	0	2,655
Env Words Change	397	0.01	0.34	-0.91	2.24
GH Consumer	397	0	1	-2.67	6.49
Env Disclosure 2022	898	0.55	0.29	0	1
Env Disclosure 2023	903	0.56	0.29	0	1
Disclosure Change	903	0.01	0.08	-0.52	0.39
GH Investor	903	0	1	-6.74	4.73
Independent Variables					
Env Performance 2022	898	4.11	1.98	0	10
GW Score	898	-0.002	0.7	-1.68	1.83
Indep BoD Score	878	7.44	2.67	0.6	10
Women BoD	851	0.35	0.1	0	0.73
Revenue	901	25,925.88	50,939.82	58.5	572,754.00
ROA	900	0.08	0.09	-0.24	1.37

Panel B: Factor Variable Description

		N	%
Sector	Communication Services	53	5.87
	Consumer Discretionary	122	13.51
	Consumer Staples	84	9.3
	Energy	40	4.43
	Financials	0	0
	Health Care	114	12.62
	Industrials	196	21.71
	Information Technology	92	10.19
	Materials	80	8.86
	Real Estate	60	6.64
	Utilities	62	6.87
Index	S&P 500	422	46.83
	EUROSTOXX 600	481	53.27
CSR	Not present (0)	300	35.01
	Present (1)	557	64.99

Panel C: Correlation Matrix

	URLs Accessed	Env Words 2022	Env Words 2023	Env Words Change	GH Consumer	Env Disclosure 2022	Env Disclosure 2023	Disclosure Change	GH Investor	Env Performance 2022	GW Score	Indep BoD Score	Women BoD	Revenue	ROA
URLs Accessed	1.000														
Env Words 2022	0.699	1.000													
Env Words 2023	0.697	0.984	1.000												
Env Words Change	0.004	-0.049	0.054	1.000											
GH Consumer	0.004	-0.049	0.054	1.000	1.000										
Env Disclosure 2022	0.083	0.064	0.061	-0.077	-0.077	1.000									
Env Disclosure 2023	0.060	0.056	0.053	-0.087	-0.087	0.965	1.000								
Disclosure Change	-0.083	-0.027	-0.029	-0.040	-0.040	-0.117	0.148	1.000							
GH Investor	-0.083	-0.027	-0.029	-0.040	-0.040	-0.117	0.148	1.000	1.000						
Env Performance 2022	0.055	0.073	0.067	-0.070	-0.070	0.751	0.726	-0.081	-0.081	1.000					
GW Score	0.030	-0.035	-0.035	-0.037	-0.037	0.287	0.252	-0.128	-0.128	-0.360	1.000				
Indep BoD Score	0.105	0.047	0.043	-0.028	-0.028	0.033	0.034	0.009	0.009	-0.033	0.117	1.000			
Women BoD	-0.013	0.053	0.043	-0.060	-0.060	0.152	0.143	-0.034	-0.034	0.175	-0.075	-0.222	1.000		
Revenue	0.006	-0.005	-0.005	-0.017	-0.017	0.151	0.159	0.033	0.033	0.192	-0.067	-0.044	0.120	1.000	
ROA	0.013	-0.010	-0.024	-0.112	-0.112	-0.008	0.000	0.032	0.032	-0.010	-0.057	0.074	-0.109	-0.009	1.000

Appendix C displays the summary statistics of the data variables used for the sample construction represented in Table 2 along with the variables used in the calculation of the greenwashing score and our developed greenhushing metric. The number of observations (N) differs for each variable depending on the number of missing data. Panel A describes the summary statistics for all continuous variables. It presents the final number of observations, mean, standard deviation, minimum, and maximum values for each variable. URLs Accessed shows the number of Environmental URLs we could access and subsequently analyze for each company in both periods before and after the GCD announcement. Env Words 2022 and Env Words 2023 denote the number of Environmental Words (as per Baier et al. (2020) ESG Dictionary) on all companies' Environmental URLs before and after GCD, respectively. Env Words Change shows the change in Environmental Words before and after GCD (Equation 1) expressed in decimals. GH Consumer is the standardised Env Words Change metric. Env Disclosure 2022 and Env Disclosure 2023 show the BESG Environmental Pillar Disclosure Score for Q3 2022 and Q3 2023, respectively. Disclosure Change shows the change in Bloomberg BESG Environmental Pillar Disclosure from Q3 2022 to Q3 2023 (Equation 3). GH Investor is the standardised metric of Disclosure Change. Env Performance is the Bloomberg BESG Environmental Pillar score for 2022. GW Score is the Greenwashing Score calculated for each company based on the difference between environmental disclosure and performance (as per Yu et al., (2020) methodology) (Equation 5). Indep BoD Score is the Bloomberg score assessing the share of independent directors on a board. Women BoD is the share of women on board expressed in decimals. Revenue shows companies' revenue for 2022, and ROA shows return on assets in decimals. Env Words Change, Disclosure Change, and GW Score are winsorised at 1st and 99th percentiles. Panel B provides a summary for each category of factor variables presenting the number of observations and the percentage they represent within the sample. It depicts the quantitative breakdown of companies by GICS Sector, Index, and the presence of CSR or Environmental Committee. Panel C displays the correlation matrix of the data variables.