

GHG reporting and impression management: An assessment of sustainability reports from the energy sector

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Abstract

The objective of this study was to analyze the quality of climate information disclosed by companies and the impression management strategies they have developed to justify or conceal negative aspects of their performance. The study is based on a qualitative content analysis of the sustainability reports of 21 energy-sector companies that use the Global Reporting Initiative (GRI) with A or A+ application levels over a period of 5 years ($n = 105$). It contributes to the literature on climate disclosure by demonstrating the ineffectiveness of the external assurance process in ensuring the quality and representativeness of the data. Significant non-compliance with GRI standards was identified in 86 of the 93 reports audited by a third party. In addition, six of the 21 companies surveyed were found to disclose increasingly opaque information over time, concealing information on the measurement and methodology used. Through this study, four impression management strategies were identified. These are employed either to justify certain information (by minimizing impacts, excuses and commitment) or to conceal it (through strategic omissions and manipulation of figures). In exposing the high incidence of non-compliance in GRI reporting and the use of impression management strategies by companies, this study shows that it will be difficult or impossible for stakeholders to reasonably assess, monitor and compare companies' climate performance on the basis of these reports.

Keywords: Climate change, GHG reporting, Global Reporting Initiative, Impression management, Opacity, Counter-accounting

Introduction

In 2010, energy production represented 35 % of direct greenhouse gas (GHG) emissions worldwide (World Energy Council 2014). With the anticipated increase in the world's energy demands, this sector's carbon balance is at risk of deteriorating over the following years. In this context, stakeholders such as politicians, investors and the general population are increasingly concerned by the climate performance of large industrial emitters and the reliability of the information that they disclose. Climate performance evaluation (Burrill et al. 2011; Sullivan and Gouldson 2012), like the development of effective policies and regulations in this area (Schaltegger and Csutora 2012; Talbot and Boiral 2013), depends on a company's ability to account for its GHG emissions and to disclose reliable data. To address this challenge, more and more companies disclose information on their climate performance, in particular through CDP and

sustainability reports (Cowan and Deegan 2011; Hrasky 2012; Prado-Lorenzo and Garcia-Sanchez 2010; Prado-Lorenzo et al. 2009). The percentage of S&P 500 companies that publish annual sustainability reports increased from 20 % in 2011 to 72 % in 2013, and most of these reports contain information on climate performance (Governance & Accountability Institute 2014). Sustainability reports should be transparent and permit the reader to obtain a comprehensive and accurate description of the company's environmental performance and the impact of its activities. Such transparency is essential to enable stakeholders to assess the company's performance and make informed decisions (GRI 2011a). As a result, environmental disclosure practices have become increasingly standardized, in particular thanks to the widespread use of the Global Reporting Initiative (GRI); the existence of this framework has contributed to the idea that rational, relevant and transparent information is available (Moneva et al. 2006; KPMG 2011). In particular, the GRI provides a better-defined framework for disclosure practices by publishing standardized indicators and guidelines. According to the GRI, reports and outputs can be used to assess, monitor and compare corporate sustainability performance (GRI 2011a, p. 5). The GRI is generally regarded as the most comprehensive and authoritative guide for the development of sustainability reports (Brown et al. 2009; KPMG 2011; Moneva et al. 2006).

However, the lack of transparency and tendency to present an idealized image of reality in these GRI reports have increasingly been criticized (e.g., Boiral 2013; Hahn and Lülfes 2014). In the same vein, climate disclosure studies demonstrate that companies often use sustainability reports as a public relations tool allowing them to communicate their commitment to the cause or even misinform stakeholders (Domenec 2012; MacKay and Munro 2012; Nyberg et al. 2013; Talbot and Boiral 2013). Some companies appear to embellish their image (Domenec 2012; Nyberg et al. 2013) or to deliberately conceal some information on their climate performance (Stanny 2013; Talbot and Boiral 2013). However, these influence strategies remain little studied, and no research into climate data disclosed in the GRI reports has specifically focused on such strategies. A few studies have questioned the quality and comparability of the information disclosed by companies (Andrew and Cortese 2011; Dragomir 2012; Kolk et al. 2008; Talbot and Boiral 2013; Boiral and Henri 2015). Nevertheless, to our knowledge, the compliance and accuracy of climate information disclosed in GRI reports have not been investigated in depth, and most existing studies do not focus on data audited by a third party (e.g., Andrew and Cortese 2011; Dragomir 2012; Kolk et al. 2008). Generally speaking, as highlighted by Milne and Grubnic (2011), it is important to conduct studies on the credibility and accuracy of climate information.

The objective of this paper is to assess the quality of information disclosed in the GRI reports of energy-sector companies and to explore the impression management strategies those companies employ in disclosing information on climate performance. At the organizational level, "impression management" refers "to any action purposefully designed and carried out to influence an audience's perceptions of an organization" (Elsbach et al. 1998, p. 68). Organizations employ these strategies to influence stakeholder perceptions (Bansal and Clelland 2004; Bansal and Kistruck 2006; Bolino et al. 2008; Patelli and Pedrini 2013). The present study focuses on impression management strategies that have been little or not at all discussed in the literature on climate change, such as excuses, strategic omissions and manipulation of figures (see MacKay and Munro 2012; Talbot and Boiral 2015). It contributes to the critical literature on the verification practices of sustainability reports (e.g., Bebbington et al. 2007; Moneva et al. 2006; Boiral 2013) by

questioning the reliability and the compliance of climate information provided in certified GRI reports. The results of the study also have implications for policymakers and investors.

The rest of the article is organized as follows. First, the literature on climate disclosure is presented. Secondly, the methodology and the main results are described. The closing section is devoted to the discussion of the results, contributions to the literature and avenues for future research.

Climate Disclosure and the Legitimacy of the Information Disclosed

The willingness of an organization to disclose information about its climate performance can be influenced by a number of factors, such as its field of operation (Hrasky 2012; Luo et al. 2012), governance mechanisms (Peters and Romi 2014; Rankin et al. 2011), performance level (Dawkins and Fraas 2010; Prado-Lorenzo and Garcia-Sanchez 2010) and legislative framework (Luo et al. 2012; Prado-Lorenzo et al. 2009). However, a company's decision to make its performance and climate commitment public does not necessarily demonstrate its desire to be more transparent and accountable. According to the legitimacy theory, voluntary disclosure is in fact a response to external pressures and does not necessarily reflect the organization's genuine commitment to sustainable development. Such actions appear to aim first of all to improve corporate image among stakeholders (Besio and Pronzini 2013; Cho et al. 2012a; Deegan 2002). External pressures may encourage businesses to adopt a symbolic and superficial approach not motivated by genuine concerns for improving performance and transparency (Boiral 2013; Cho et al. 2010; Laufer 2003).

Such a critical approach to the issue is expressed in a number of studies devoted to the factors influencing climate disclosure. For example, in a study of 101 Fortune 500 companies, Prado-Lorenzo et al. (2009) demonstrate a negative relationship between the amount of data disclosed and economic performance. In fact, the companies with the least exemplary behavior release the largest amount of information in order to mitigate various stakeholder pressures. The disclosure of such information appears to be a mechanism of legitimization employed for the purposes of complying with regulations and attracting investors (Prado-Lorenzo et al. 2009). Other studies show that such a quest for legitimacy is especially important for companies whose environmental performance is poor (Cowan and Deegan 2011; Prado-Lorenzo and Garcia-Sanchez 2010). According to Dawkins and Fraas (2010, p. 315), companies with a weak environmental performance use climate disclosure as a "safety net against threats to legitimacy."

In this context, sustainability reports tend to be used as a legitimizing tool to reduce social pressures and limit criticisms from external stakeholders. They can also be seen as promotional and public relations tools used to present corporate commitments as exemplary or to misinform stakeholders (Domenec 2012; MacKay and Munro 2012; Nyberg et al. 2013; Talbot and Boiral 2013). In their analysis of Exxon's climate change information campaigns, MacKay and Munro (2012) demonstrate that the company deliberately misinformed stakeholders in its corporate citizenship reports and public relations materials. Such self-promotion is also observed by Nyberg et al. in their 2013 study of the climate commitment of 25 Australian companies. The study demonstrates that the companies used voluntary disclosure to project an image of being responsible organizations meeting civil society's expectations.

In general, critical literature on climate disclosure demonstrates that a significant gap exists between a company's public image and its actual commitment to climate change. Such image greening has been observed, for example, in the disclosure practices of Chinese companies (Chu et al. 2013), whose annual reports tend to focus only on positive or neutral elements. In the same vein, Stanny (2013) shows that Fortune 500 companies appear to deliberately conceal information about their climate performance and disclose the minimum amount of data to avoid criticism. Talbot and Boiral's (2013) study of the trustworthiness of GHG inventories of major Canadian emitters also reveals such a lack of transparency: In 35 % of the cases studied, managers admitted having disclosed misleading or incomplete information in the past, in particular to protect sensitive data on energy efficiency and financial relationships with government authorities. The study points out the importance of conducting further research on companies' tendencies to conceal certain information.

All these findings suggest that the disclosure process is influenced to a greater extent by the logic of public relations than by that of transparency, yet few studies have focused on the strategies used to manipulate and influence perceptions of climate performance. As stated by MacKay and Munro (2012, p. 1508), in research on climate change, insufficient attention has been paid to the theorization and observation of information tactics.

Some authors also point out major problems in terms of the comparability and quality of information disclosed by companies (e.g., Dragomir 2012; Green and Li 2012; Kolk et al. 2008; Talbot and Boiral 2013; Boiral and Henri 2015). When sustainability reports fail to provide valid and verified data, the information disclosed loses its value to stakeholders, including investors and policymakers (O'Dwyer et al. 2005). Kolk et al.'s (2008) study focused on the value of information disclosed by companies in the Carbon Disclosure Project (CDP) for investors. The authors identify numerous problems in measurement and comparability. They mention in particular widespread cases of missing data, the lack of consistency in the emissions taken into account, problems of consistency in the methodologies used and the absence of external verification of results (Kolk et al. 2008). Other studies of CDP data reach the same conclusion. The variety of methodologies employed appears to make it impossible to compare data and to reduce the usefulness of the information disclosed (Andrew and Cortese 2011; Sullivan and Gouldson 2012).

Moreover, companies appear to reveal different information about their carbon footprint in their communications and public relations materials. According to Depoers et al. (2014), the data on GHG emissions provided in sustainability reports are more limited than that provided to the CDP. This difference can be explained by companies' tendency to exclude certain emissions from sustainability reports and to use their own standards to disclose their climate performance. Dragomir (2012), in turn, focuses on the quality of information on climate performance disclosed by five major European oil and gas companies. The study compares the data disclosed in sustainability reporting with the requirements outlined in the Greenhouse Gas Protocol. This longitudinal analysis of climate data sheds more light on certain shortcomings, especially calculation methodology and data manipulation. However, according to the study, data quality appears to have improved in the 2000s. The study demonstrates the relevance of conducting longitudinal studies to better understand the evolution of disclosure practices. The relevance of this type of longitudinal study is also stressed by several other authors (Chu et al. 2013; Freedman and Park 2014).

As these studies show, problems related to data quality and comparability do exist. Such issues might be caused by the lack of external data verification. In fact, several authors consider the assurance process to be an important element in ensuring the quality of information of corporate GHG emissions (Green and Li 2012; Schaltegger and Csutora 2012; Simnett et al. 2009). According to the GRI, assuring sustainability reporting has numerous benefits: “Increased recognition, trust, and credibility; reduced risk and increased value; improved board and CEO level engagement; strengthened internal reporting and management” (GRI 2014, p. 21). On the other hand, the reliability of the sustainability reporting audit practices has been widely criticized (e.g., Moneva et al. 2006; Bebbington et al. 2007; Boiral 2013). However, these criticisms remain quite general and are not focused on the reliability of carbon reporting assurance (Downie and Stubbs 2013; Talbot and Boiral 2013). A few specific studies have identified some inaccuracies in reports audited by a third party. The analysis of the practices and behaviors of audit firms leads Talbot and Boiral (2013) to state that the assurance process is akin to a rational myth (Meyer and Rowan 1977): It enhances the trust of external players in sustainability reports but has no real impact on the quality of the information. In this light, further studies should be conducted to confirm whether external assurance actually helps improve the validity of the data or whether it is an image and impression management tool.

Climate Communication

The concept of impression management, originally developed in social psychology, refers to “behavioral strategies that people use to create desired social image or identities” (Tetlock and Manstead 1985, p. 59). Most analyses employing this theory focus on the actions of individuals adopted to influence an audience’s perceptions (Bolino et al. 2008; Hooghiemstra 2000). However, organizations also tend to use impression management strategies to influence stakeholder perceptions (Bansal and Clelland 2004; Bansal and Kistruck 2006; Bolino et al. 2008; Patelli and Pedrini 2013; Talbot and Boiral 2015). These strategies concern “any action purposefully designed and carried out to influence an audience’s perceptions of an organization” (Elsbach et al. 1998, p. 68). Such actions appear to have a positive impact on corporate image and reputation and to help protect companies against potential threats to their legitimacy by ensuring consistency between their practices and society’s values (Elsbach and Sutton 1992; Elsbach 2003).

According to Boiral (2013, p. 1042), the use of impression management strategies in sustainability reports can be described as a simulacrum based on “the reporting of unreliable, misleading or non-transparent information and images that tend to highlight and artificially inflate the corporate commitment to sustainable development.” Impression management strategies can also be used to conceal certain elements by manipulating the manner in which information is presented and disclosed (Brennan and Merkl-Davies 2014; Merkl-Davies and Brennan 2007; Lindblom 1994). Godfrey et al. (2003, p. 96) state that impression management occurs “when management selects the information to display and presents that information in a manner intended to distort readers’ perceptions of corporate achievement.” Numerous concealment strategies, such as the selection of data and comparisons as well as the visual and thematic manipulation of information, can be employed to present an idealized image of the firm (enhancement) or to obscure negative elements of the organization’s performance (obfuscation) (Merkl-Davies and Brennan 2007). Companies’

tendency to present an idealized image of reality and to conceal negative aspects of their performance from stakeholders has been highlighted in the literature on environmental disclosure (e.g., Boiral 2013; Cho et al. 2010, 2012b; Lindblom 1994). For example, in a study devoted to the graphical analysis of 77 sustainability reports, Cho et al. (2012b) demonstrate that companies tend to graphically represent the positive aspects of their performance and to present misleading information (material distortion) to improve their image. Despite the strategic importance of the manner in which information is presented in sustainability reports, the concept of impression management strategies has not, to our knowledge, been used to study the conformity of climate performance indicators in GRI reports.

These strategies are all the more likely to be used given that information on corporate performance is complex and its disclosure is subject to strong external pressures (Boiral et al. 2012; Kolk et al. 2008; Talbot and Boiral 2015). The complexity, uncertainty and opacity of environmental issues may indeed encourage organizations to display a symbolic rather than substantial engagement in this area (Bansal and Kistruck 2006). In such a scenario, an organization adopts communication tools that make the organization appear to comply with the expectations of stakeholders, who are not able to verify the validity of this information. When a company sees its legitimacy threatened, it may use defensive impression management strategies (e.g., apologies, excuses and justifications) to protect its image or to justify socially reprehensible practices or behavior (Mulvey et al. 1998; Ogden and Clarke 2005; Stevens and Kristof 1995). These strategies are clearly linked to neutralization techniques (Chatzidakis et al. 2004), which are used to deny responsibility or to rationalize ethically questionable behaviors (Strutton et al. 1994; Sykes and Matza 1957). Neutralization techniques allow individuals to neutralize internal and external demands for conforming to social norms. They contribute to limit self-blame and negative sanctions associated with non-compliance (Gruber and Schlegelmilch 2013). While assertive impression management strategies are designed to bolster one's image, defensive impression management strategies (e.g., neutralization techniques) are designed to protect or repair one's image (Bolino et al. 2008; Ellis et al. 2002). Although the concept of neutralization techniques was originally developed by Sykes and Matza (1957) to describe quite broad justifications (denial of responsibility, denial of harm or injury, denial of the victim, appeal to higher loyalties, condemnation of condemners), they can be applied to a variety of contexts, including sustainability reports and climate communications (Talbot and Boiral 2015; Boiral 2015). In a recent study of ten major Canadian emitters, Talbot and Boiral (2015) demonstrate the importance of these techniques in rationalizing the behaviors of major contributors to climate change. The study highlights companies' tendency to disclose unreliable information, minimize the impact of their activities and blame others. The article also recommends that longitudinal studies be conducted to monitor the evolution of the persuasion rhetoric and tactics adopted by companies.

In summary, the literature on climate disclosure highlights the lack of transparency and problems concerning the quality and validity of the information disclosed. However, current research on GHG reporting is still insufficient as far as the issues raised are concerned. Further studies need to be conducted to evaluate the evolution of reporting practices and to better understand concealment strategies and arguments employed by companies to justify the failure to disclose transparent and reliable information.

Methodology

The objective of this paper is to assess the quality and compliance of climate information disclosed by energy-sector companies and to explore impression management strategies used in this field. This goal can be best achieved by conducting a qualitative study based on the content analysis of sustainability reporting. The method is particularly suited to enrich understanding and knowledge of emerging phenomena (Bowen 2009; Downe-Wamboldt 1992; Hsieh and Shannon 2005). Brennan and Merkl-Davies (2014) in fact state that the approach is relevant for the study of impression management strategies used in corporate communications.

Data collection

The energy industry was selected for this study because of its strategic importance in climate change management and the strong external pressures on large emitters (Okereke and Russel 2010; Talbot and Boiral 2015). Companies in this sector are in fact responsible for approximately 30 % of the global emissions of Fortune 500 companies (Carbon Disclosure Project 2013). Data collection was based on climate information disclosed by companies in GRI sustainable development reports published between 2009 and 2013.

The GRI database was used to identify the companies and reports to be studied.¹ Several criteria were applied. First, companies had to have published GRI reports with the A application levels for the last five years. In theory, these reports are supposed to be the most comprehensive and transparent (GRI 2011a). Organizations that publish such reports should in fact thoroughly apply the GRI guidelines and either provide information on core performance indicators or explain the reasons for the omission of certain indicators. The + symbol is added to the A level if the report has been subject to an external audit. Second, the reports had to be based on version G3 or G3.1 of the GRI guidelines. As climate performance indicators (EN16 and EN17) and protocols remained unchanged during this period (GRI 2011b), it was possible to compare and monitor the evolution of companies' climate disclosure practices. Finally, for linguistic reasons, the reports had to be published in English. If reports were unavailable in the GRI database or available in another language, a search was performed on the company's Web site to confirm the absence of an English version. At the end of the selection process, 105 reports published by 21 different companies were selected. The vast majority of these reports had been certified by a third party (93 reports or 88.6 %). To facilitate analysis, the sections concerning climate change and GHG emissions in each report were extracted and exported into QDA Miner version 4 qualitative analysis software. In total, over 1000 pages of text were analyzed. Table 1 presents the reports selected based on the level of application and the company.

Table 1 Company reports' application level

¹ The GRI database is constantly changing. Some companies can modify their profiles and add or remove certain reports. The selection of reports to be used in this study was made between February 1 and 5, 2014.

Company	Application level				
	2009	2010	2011	2012	2013
Abengoa Bioenergía	A+	A+	A+	A+	A+
BG Group	A+	A+	A+	A+	A+
BP	A+	A+	A+	A+	A+
BPCL	A+	A+	A+	A+	A+
CLP	A+	A+	A+	A+	A+
Enagás	A+	A+	A+	A+	A+
ERG	A	A	A+	A	A
EVN	A+	A+	A+	A+	A+
Gamesa	A+	A+	A+	A+	A+
Grupa Lotos	A	A	A	A+	A+
Hess Corporation	A+	A+	A+	A+	A+
Itaipu Binacional	A+	A+	A+	A+	A+
Johnson Controls	A	A	A	A	A
OMV	A+	A+	A+	A+	A+
Petrobras	A+	A+	A+	A+	A+
Repsol YPF	A+	A+	A+	A+	A+
Rosneft	A+	A+	A+	A+	A+
Royal Dutch Shell	A+	A+	A+	A+	A+
Statoil ASA	A+	A+	A+	A+	A+
S-OIL	A+	A+	A+	A+	A+
Wärtsilä Corporation	A+	A+	A+	A+	A+

GRI reports rather than CDP questionnaires were chosen for analysis for three reasons. First, the application-level system of the GRI G3 facilitates the identification of companies with the highest disclosure standards: A and A+ application levels, which require companies to disclose information on each core indicator—including those on GHG emissions—or to explain the reasons for the absence of information. Secondly, unlike the CDP questionnaire, the climate change elements in GRI reports have remained unchanged for the period of study, allowing for a longitudinal analysis. Lastly, the information disclosed in sustainability reports can be verified by external auditors, and it is possible to access the statements of auditing firms. It is also important to note that the GRI and CDP are attempting to harmonize their practices (CDP 2015). Incidentally, the CDP considers verified sustainability reports to be a valid source of information for evaluating the quality of data disclosed by companies.

Data analysis

Content analysis was based on a systematic classification of the collected data (Hsieh and Shannon 2005). The process allows for information derived from raw data to be grouped by significant

recurring themes. Given the large amount of information collected on climate performance and disclosure practices, information classification and analysis was carried out in two stages.

Initially, the company’s announced compliance with GRI standards on climate performance indicators (EN16 and EN17) was verified through a counter-accounting approach. This approach, little used in research (Apostol 2015; Boiral 2013; Dey 2007; Milne and Grubnic 2011), allows researchers to assess the transparency of information disclosed in sustainability reports by analyzing information that is not controlled by managers and compliance with external standards that companies are supposed to follow. The relevance of counter-accounting for assessing the quality of GRI reports is demonstrated by Boiral (2013). In particular, his analysis demonstrates a strong tendency among companies to conceal significant negative events. In the present study, the counter-accounting process was based on the comparison between the information on climate performance released in the analyzed sustainability reports and the GRI measurement protocols for environmental indicators that the companies using this standard were supposed to follow (GRI 2011c). Table 2 presents the main requirements of the GRI measurement protocols for climate performance indicators. An assessment of the compliance of the 105 reports analyzed in this study with the GRI requirements on climate performance was carried out using QDA Miner software.

Table 2 Main GRI requirements on GHG performance indicators

Table 2 Main GRI requirements on GHG performance indicators	Disclosure	Title	Components of the disclosure
	EN16	Total direct and indirect greenhouse gas emissions by weight (Scopes 1 and 2)	Indicate standard and methodology used Identify direct and indirect emissions Report total GHG emissions
	EN17	Other relevant indirect greenhouse gas emissions by weight (Scope 3)	Identify the GHG emissions resulting from indirect energy use Identify the organization’s activities that cause indirect emissions Report the sum of indirect GHG emissions

Source: GRI (2011c, pp. 22–24)

Secondly, a qualitative and inductive analysis of the content of selected GRI reports was conducted (Thomas 2006). Initially, two general themes (measurement of climate performance and compliance with GRI requirements) were defined to begin the analysis. These themes were subsequently further developed or adapted based on ideas emerging from the data analysis. At the end of this inductive process, 34 categories grouped under three broad themes and seven sub-themes were formed. In total, 1073 excerpts from the reports were coded. Concerning the specific issues addressed in this study (disclosure practices and impression management strategies), segments derived from 19 categories were used. They were grouped into three sub-themes: lack of transparency, justification for non-disclosure and obfuscation of information. To ensure the thoroughness of the analysis, two verification strategies were employed. First, as suggested by Miles and Huberman (1994), the categories were defined to facilitate the interpretation of information contained in the sustainable development reports. These definitions permitted the standardization of the codification process. New categories were also discussed between the researchers involved in the process. For example, three meetings were held to discuss emerging codes. Secondly, the clarity of the categories was evaluated on the basis of the first coded reports to ensure a common understanding of the coding tree (Thomas 2006). Double-blind coding

(Thomas 2006) was also carried out for the first 20 reports to compare the categories created by the two researchers. At the end of this stage, some categories were merged. This analysis enabled the identification of measurement problems and the impression management strategies used by companies to conceal or justify certain aspects of their climate performance.

Results

The analysis of climate information in sustainability reports reveals that companies have a strong tendency to disclose information that is not compliant with GRI standards (2011c) and to employ impression management strategies. Overall, three interdependent and non-exclusive issues affecting the credibility and transparency of corporate GHG statements were observed:

- disclosure of non-compliant information
- legitimization of negative aspects through neutralization techniques
- obfuscation of negative aspects and enhancement of positive aspects

Disclosure of non-compliant information

Counter-accounting for the information which the reports provide concerning climate performance (EN16, EN17) reveals a significant inconsistency between the data actually disclosed with the supposed transparency of A or A+ application levels. Nonconformities were revealed in 98 of the 105 reports studied (93.3 %). Table 3 summarizes the compliance issues found in the reports for both indicators.

Table 3 Non-compliance in climate disclosure

Company	2009		2010		2011		2012		2013	
	EN16	EN17	EN16	EN17	EN16	EN17	EN16	EN17	EN16	EN17
Abengoa Bioenergía	1,3	3	1,3	√	3	√	3	√	3	√
BG Group	1, 2	4	1	4	1	4	1	√-X	1	√-X
BP	1	4	1	2	1	3	1	3	1	3
BPCL	1	X	3	X	1	4	1	4	1	4
CLP	1,2-X	4	1,2-X	4	1,2-X	4	1,2	4	1	√
Enagás	1,3	1	1,2,3	1	1,2,3	1	1,2,3	1	1,2,3-X	1
ERG	3	X	3	X	3	X	3	X	3	X
EVN	1,2,3	1,3	1,2,3	1,3	1,2,3	1,3	1,2,3	2	2,3	2
Gamesa	1,2,3	4	1,2	4	2	4	1,2	4	2	√
Grupa Lotos	1,2	4	1,2	4	1,2	4	1	X	√	4
Hess Corporation	1	√	1	√	1	√	1	√	1	√
Itaipu Binacional	2,3	√	1,3	3	1,2,3	3	1,2,3	3	1,2,3	3
Johnson Controls	1	√	1	√	1	√	1	√	1	√
OMV	1,2,3-X	3-X	1,2,3-X	3-X	1,2,3-X	3-X	1,2,3-X	3-X	1,3-X	√-X
Petrobras	1	4	√	X	√	X	√	X	√	X
Repsol YPF	1,3	√	1,3	√	1,3	√	3	√	3	√
Rosneft	X	X	X	X	X	X	√	2	1	2
Royal Dutch Shell	1,2	4	1,2,3	4	1,3	3	1,3	3	1,3	3
Statoil ASA	1,2	X	1,2	X	1,2-X	X	1,2-X	√-X	1,2	4
S-OIL	1,2	X	1,2	X	1,2	X	1,3	X	1,3	X
Wärtsilä Corporation	1,3	X	1,2,3	X	1,2,3	X	1,2,3	X	1,2,3	X
Compliant information (%)	0	19	4.8	19	4.8	19	9.5	28.6	9.5	38.1
Non-compliant information (%)	95.2	52.4	90.5	47.6	90.5	52.4	90.5	47.6	90.5	42.9
Justification for non-disclosure (%)	14.3	33.3	14.3	38.1	19	33.3	9.5	38.1	9.5	28.6
Non-compliant report (%)	20 (95.2 %)		19 (90.5 %)		19 (90.5 %)		20 (95.2 %)		20 (95.2 %)	

Non-compliant information EN16: (1) indicate standard and methodology used; (2) identify direct and indirect emissions; (3) report total GHG emissions

Non-compliant information EN17: (1) identify the GHG emissions resulting from indirect energy use; (2) identify the organization's activities that cause indirect emissions; (3) report the sum of indirect GHG emissions; (4) no information

√—compliant information; X—justification for the non-disclosure of certain aspects

The nonconformities identified can be grouped into three broad categories: uncertainties concerning measurement methods and emission calculations, incomplete or unrepresentative information on performance indicators, and lack of information.

Uncertainties concerning measurement methods and emission calculations

The first category concerns the obligation to indicate the standard used and the related methodology for calculating direct and indirect emissions (EN16). In 77.1 % of the reports, this GRI requirement was not met. Companies used various practices to circumvent the transparency requirement for methods of measuring and calculating emissions. One of these, observed in 48 reports (45.7 %), consists in disclosing no information whatsoever about this requirement. This uncertainty about the choice of methodology affects the reader's understanding of the data disclosed and comparison of the data over time or between companies.

Another practice consists in disclosing incomplete information on the standard and methodology. Such a lack of precision was observed in 33 of the reports studied (31.4 %). As mentioned in the GRI measurement protocols (2011c, p. 22), companies are required to clearly identify the

measurement used (e.g., direct measurement, calculations based on default data, and estimates) and the related standard. This disclosure is mandatory and central to the assessment of the company's actual climate performance. However, many reports give only a partial picture of their measurement protocols. For example, some companies like BG Group only documented the methodology and standards used to measure indirect emissions for the performance indicator EN16. The methods used for direct emissions were not described. The following excerpt from a report is a good illustration of such a lack of clarity and the absence of important data on the standard and methodology used to measure GHG emissions:

Our Scope 1 emissions are those that arise directly from sources we own or control. They derive principally from fuel use, flaring, venting, fugitive losses and distribution losses. In 2012, operations directly under our control emitted 7.7 million tonnes of GHG, an increase of around 200,000 tonnes, or 3 %, compared with 2011. Our equity share emissions were 9.6 million tonnes of GHG, a decrease of one million tonnes, or approximately 10 % compared with 2011. (2013, pp. 8–9)

Incomplete or unrepresentative information on performance indicators

The second category of non-compliance concerns the disclosure of incomplete or unrepresentative data. Overall, problematic elements were identified in 69 reports (65.7 %). One important issue concerns the extent of corporate GHG inventories. Some reports were, among other things, incomplete in terms of emission sources and did not take into account all the elements in the calculation of direct and indirect emissions. For example, Royal Dutch Shell did not disclose any information whatsoever on emissions generated by the production of electricity or heat (EN16—Scope 2) in its carbon report for 2009. It only presented data on direct emissions:

The direct greenhouse gas (GHG) emissions from facilities we operate were 67 million tonnes on a CO₂-equivalent basis in 2009, 11 % lower than in 2008 and around 35 % below our 1990 level—putting us well on track to meet our voluntary target for 2010 of 5 % lower GHG emissions than our comparable 1990 level. (Royal Dutch Shell 2010, p. 9)

Another problem observed concerns confusion on the manners of reporting certain aspects. Some companies have mixed up the information for different indicators. This confusion affects the representativeness of the data on climate performance. For example, Enagás (2010, p. 120) mentioned electricity consumption among other indirect emissions (EN17). However, these emissions should be measured in the EN16 indicator (Scope 2) and not in EN17 (Scope 3). In addition, some companies provided an overall measurement of emissions; this goes against the GRI guidelines, which state that the amounts of EN16 and EN17 emissions should be reported separately. Such problems with the performance presentation were found in 56 of the reports studied (53.3 %).

Lack of information

The third category of non-compliance consists in a complete lack of information on a given climate performance indicator. Some companies did not disclose information about their climate performance, and, contrary to the A and A+ application-level requirements, this decision was not

clearly explained in their sustainability reports. This lack of information was observed in 23 reports (21.9 %), and it concerned the EN17 indicator only.

Evolution of disclosure practices

The various inconsistencies highlighted in this analysis of corporate compliance with GRI guidelines (2011c) raise a number of questions concerning the usefulness and representativeness of reports audited by a third party. Nonconformities were observed in 86 of the 93 audited reports (92.5 %), which is a proportion similar to that observed for unaudited reports analyzed in this study. An even more surprising element is that only two companies published compliant reports during the period studied (Rosneft 3 reports and Petrobras 4 reports). For example, Rosneft published compliant reports for three consecutive years (2009–2011). However, its sustainability reports do not disclose information regarding climate performance indicators, limiting themselves instead to simply justifying the lack of data.² In addition, the various examples of non-compliance identified in this analysis were not pointed out in any of the assurance statements produced by audit firms. In this light, the accuracy and value of the certification process can be questioned. Similar instances of non-compliance were identified in all uncertified reports.

Over time, the disclosure practices for the EN17 indicator (other indirect emissions—Scope 3) have improved. The percentage of data for this indicator that are in line with the GRI guidelines has increased from 19 % in 2009 to 38.1 % in 2013 (see Table 3). Moreover, the proportion of non-compliant information decreased from 52.4 % to 42.9 % during the same period. On the other hand, as far as the EN16 indicator (direct emissions and indirect emissions related to energy—Scope 1 and 2) is concerned, the situation is much more worrisome. In 2013, for the third time in five years, only one of the reports published contained information consistent with the GRI guidelines for climate performance. The problem with corporate transparency is amplified by the fact that the performance and disclosure practices of certain companies have become increasingly opaque. Opacity can be defined by “the difficulty with which the environmental impact of a firm’s task can be measured and understood by external stakeholders” (Jiang and Bansal 2003, p. 1062). In the context of carbon disclosure, opacity is reflected by the communication of unclear, imprecise or incomplete information about the measurement of climate performance. This opacity is in contradiction to the GRI’s “Clarity” reporting principle, which states that “the report should present information in a way that is understandable, accessible, and usable by the organization’s range of stakeholders” (2011a, p. 16). Increasing opacity was observed in the reports of six companies (BPCL, Enagas SA, Johnson Controls, Rosneft, Statoil ASA and S-OIL), and it was manifested in particular by the lack of clear data on the standard and methodology used. For example, Rosneft provided the following information on the extent of its GHG inventory and the protocols used for the first time in 2012:

At the end of 2011, the Company started developing a methodology for the inventory of greenhouse gas emissions associated with its operations. The methodology was completed in the first half of 2012 (...) The results of the inventory are presented in the table below in accordance with the requirements of the Greenhouse Gas Protocol (hereinafter, the GHG

² In accordance with the GRI A and A+ application level, reports should disclose information on core indicators or provide reasons for failure to do so. The five Rosneft reports under study were granted the A+ application level.

Protocol) by the World Business Council for Sustainable Development (WBCSD) and the World Resources Institute (WRI) and of the Sustainability Reporting Guidelines by the Global Reporting Initiative (Oil and Gas Sector Supplement). Standard emission factors provided in the IPCC Guidelines for National Greenhouse Gas Inventories (2006) and information about the composition of other gases burnt by the Company, including APG, were used in the calculations. (Rosneft 2012, p. 26)

However, the following year, the company removed all the data concerning the measurement and emission factors from the report, merely mentioning that the methodology for measuring GHG inventory was under development, which somewhat contradicts the information provided in the report published in 2012:

In 2012, the development of methodological guidelines for the inventory of greenhouse gas emissions at the Company level continued. At present, the development of the document has been completed, and it is pending approval. (Rosneft 2013, p. 39)

In summary, the majority of GRI reports analyzed were characterized by incomplete, non-compliant or missing elements on climate performance. Although nearly 90 % of the reports analyzed were verified by third-party auditors, the lack of reliability and the non-compliance of information on climate performance was not mentioned in assurance statements.

Legitimation of negative aspects through neutralization techniques

A company's decision to disclose negative information about its climate performance or not to do so can clearly affect its image and compromise its social legitimacy. To neutralize the potential negative impacts and at the same time rationalize their practices, some companies have developed neutralization techniques. The qualitative analysis of climate information provided in the reports has revealed two such techniques: (1) minimizing the impact of non-measured emissions and (2) excuses and future commitments.

Minimizing the impact of non-measured emissions

The minimizing strategy, used in about 20 % of reports, permits companies to marginalize and at the same time reduce the perceived importance of these emissions. Two main approaches are used to influence perceptions of unmeasured emissions. The first consists in the climate disclosure emphasizing the importance of other sources of emissions and the insignificance of unmeasured elements. The following passage from Statoil's ASA report provides a good and particularly interesting example: "The main contributors to greenhouse emissions from our business are direct emissions of carbon dioxide and methane. Indirect GHG emissions are negligible" (Statoil ASA 2011). Statoil ASA's claim concerning the marginal impact of indirect emissions of the carbon footprint is particularly interesting. The company did in fact disclose, in its 2012 report, information on emissions generated by business travel: "Indirect greenhouse gas emissions from business travel by air in 2011 are calculated to be 40,700 tonnes of CO₂ equivalents" (Statoil ASA 2012). However, these data were eliminated from the 2013 report. This disappearance makes it difficult to analyze the evolution of the company's performance over time. Moreover, it raises questions about establishing the disclosure threshold and activities taken into account by the

organization in measuring indirect emissions (EN17). Can 40,700 tons of greenhouse gases really be considered negligible? Other companies express the same view, arguing that the impact of these emissions is marginal. For example, in a report published in 2009, OMV stated that it does not measure this indicator through a formal system at the corporate level, but that it has implemented various initiatives in this field:

Although indirect GHG emissions from the supply chain, logistics, business travel, and other business activities are not quantified on a Group-wide basis, they are the focus of special projects and awareness programs for employees and contractors. (OMV 2009, p. 31)

The second argument employed to minimize the importance of emissions not taken into account consists in stating that the issue is widespread and also concerns other organizations. This justification is based on the idea that the behavior displayed by the company is also displayed by all other players in the industry or sector of activity. Such a generalization tends to reduce the possible pressures and criticism which a company will face concerning its climate performance or lack of transparency. In this manner, a company can distance itself from the negative image associated with its non-disclosure by pointing out the fact that this practice is standard in the field. This strategy has been used, among others, by Rosneft. The company has repeatedly stressed that indirect emissions (EN17) are not considered significant and material by competing companies in the same area:

According to the data published in sustainability reports of a number of major oil and gas companies, other indirect greenhouse gas emissions (e.g. emissions associated with third-party transportation services) are not a significant impact factor for the sector. In addition, in the process of defining report content this issue has not been found material. (Rosneft 2011, p. 107)

Excuses and future commitments

The strategy of excuses and future commitments is also observed in approximately 20 % of reports. Companies apologize for not disclosing information and promise significant improvements in the measurement of GHG emissions in order to protect themselves from the negative impacts of the failure to disclose information regarding performance indicators. One of the arguments used to justify such socially reprehensible behavior consists in emphasizing that the measuring system is in development and that the data have not been consolidated for the reference period. Some companies use this type of argument routinely, by simply repeating the same statement in the reports for subsequent years without ever making the adjustments announced. For example, for the five years studied, the Wärtsilä Corporation's report stated that its disclosure system is in development (Wärtsilä Corporation 2013, p. 140). During the same period, S-OIL emphasized that it was in the process of revising its disclosure procedures for its indirect emissions (EN17) (S-OIL 2012, p. 66). In both cases, no improvement of emission measurement practices was observed. The same excuses were used mechanically year after year. Some companies also mentioned measurement uncertainties and the lack of standardization to justify their decision not to measure all the elements. The following extract from the BG Group report is a good illustration of this strategy:

While recent progress has been made in developing accounting and reporting standards for life cycle and corporate value chain emissions, there is as yet no definitive methodology for calculating Scope 3 emissions. There is also considerable potential for duplicating emissions along the energy chain. (BG Group 2012, p. 35)

Furthermore, some industrial emitters (e.g., Grupa Lotos and BPCL) admit that numerous gaps exist in their climate disclosures. However, they promise to make adjustments in the coming years to remedy the situation. Such a commitment to improving practices over time protects these companies from some criticism and permits them to project an image of an organization concerned about the issue. For example, BPCL promised to incorporate more elements in its GHG inventory in the coming years:

We plan to expand the scope of measurement of our existing GHG accounting studies to also assess the impact of product and raw material transport on our GHG emissions, and we will commence reporting on this from FY 2014–15. (BPCL 2013, p. 51)

In summary, two neutralization techniques were mobilized by companies to justify the non-disclosure of certain elements. The first is to minimize the importance of unmeasured emissions or to affirm that this practice is widespread in the industry. The second technique is to apologize for the lack of information and promise improvements to the measurement system in the coming years.

Obfuscation of negative aspects and enhancement of positive aspects

Companies can influence stakeholders' perceptions of their climate performance by manipulating information to present an idealized image or to conceal certain negative aspects. Two concealment strategies were employed by the companies studied to influence stakeholder perceptions: strategic omission and manipulation of numbers.

Strategic omission

The first of these strategies, strategic omission, consists in deliberately failing to communicate or to take into account certain important elements of climate performance. Such omissions can take different forms, ranging from non-compliance with the GRI measurement protocol on the identification of the methodology to taking into account a limited number of emission sources. Such an omission diminishes the usefulness of climate information and greatly affects stakeholders' ability to evaluate the company's performance. As a result, the comparison of data over time and between companies in the same sector becomes an arduous and approximate task. Companies' tendency to underestimate their emissions and to provide incomplete information helps create an idealized image of their situation. For example, Enagás disclosed their fugitive emissions for the first time in 2013. This change in disclosure practices led to an increase in its total emissions for 2012 by 25 %. The company explained its decision to take into account this new element by the coming into effect of changes to the parameters of the European carbon market. Yet measurement protocols (GRI 2011c) required fugitive emissions to be disclosed in GRI reports for several years prior to that. In this light, it appears that Enagás camouflaged some emissions for

several years. The following extract from the company's report demonstrates the importance of this omission for the comparability of data over time:

The chart below shows Enagás' emissions over the last three years. The figures include items reported for the first time in 2012, and for which there are no comparable data for prior years (emissions from the new Gaviota and Yela facilities, N₂O emissions, emissions from HCFC use and emissions from gas combustion for heating and cooling systems) ... Under the new scope applied in 2012, the major source of emissions is gas burnt in flaring, accounting for 30.29 % of total emissions. (Enagás 2013, p. 80)

Companies also tend to communicate crucial information in the footnotes at the bottom of a page or under a table. For example, BP (2011, p. 2) mentioned in a footnote to a table that it did not include the emissions caused by the Deepwater Horizon incident in its GHG inventory because of the uncertainty in the measurement. However, in the following years, BP continued to refuse to adjust its data despite the fact that it had at its disposal an estimate of emissions caused by this environmental disaster:

In 2010, we did not report on GHG emissions or flaring associated with the incident or response. (...) We have since estimated the gross CO₂ equivalent emissions from response activities to be approximately 481,000 tonnes. We have estimated the gas flared during the response to be approximately 56,000 tonnes. We have not restated our 2010 numbers since our practice is only to restate historical emissions for material inaccuracies. (BP 2012, p. 4)

This strategic omission hinders the evaluation of the company's actual performance. In addition, the presentation of this crucial information in small print in a footnote to a table makes it difficult to access (BP 2012, p. 4). The company, like others (e.g., Enagás, Hess Corporation, Petrobras, Royal Dutch Shell and S-Oil), manipulated the visual presentation of essential information on its climate performance. This manipulation helps to attract the reader's attention to more positive elements brought to the fore by the company such as initiatives adopted to reduce emissions. Information on the elements measured and uncertainties in measurement is often provided in footnotes. The following two excerpts from Petrobras and Royal Dutch Shell sustainability reports demonstrate the potential strategic importance of information provided in footnotes to tables for assessing climate performance:

The 2009 direct emissions were revised. The result of 62 million tons of CO₂ equivalent published in the 2009 Sustainability Report was revised during the critical assessment process carried out for the results. (...) Other indirect greenhouse gas emissions had not been consolidated yet when this report was closed. (Petrobras 2011, p. 85)

The figure differs from that published in the 2006 environmental report because the report did not take account of emissions corresponding to gas burnt in flaring operations at regasification plants. (Enagás 2009, p. 112)

Manipulation of numbers

The second concealment strategy, the manipulation of numbers, consists in presenting information in a manner that is too complex or opaque to permit an evaluation of the company's actual performance. The companies that employ this strategy in fact fail to respect the GRI requirements for the presentation of data, notably the principle of clarity, which states that the information should be "understandable and accessible to stakeholders" (GRI 2011a, p. 16). For example, Itaipu Binacional presented its carbon footprint in terms of intensity rather than absolute emissions (tons of CO₂ equivalent):

During the year, for each megawatt-hour, emission averages of 0.88 kg of CO₂ and 0.06 kg of CH₄ were calculated, which totals 2.05 kg of CO₂ equivalent per MWh. This means a reduction of 5 % in relation to the previous year, as, in 2007, 2.18 kg of CO₂ eq/MWh were emitted. The reservoir's residual emission of CO₂ and CH₄, as with the total annual emissions, are the same as reported in the 2007 Sustainability Report (Itaipu Binacional 2009, p. 131)

However, even if GHG intensity is relevant to assess the climate performance of businesses, such non-compliance with the GRI guidelines significantly affects stakeholders' ability to understand and analyze the information disclosed. Differences in data presentation hinder any attempts to benchmark climate performance in a given sector. Companies also tend to minimize the impact of changes in their measurement methods and fail to explicitly mention the real impact of emissions in the reports. This lack of clarity can significantly affect the possibility of using the information. For example, Gamesa mentioned in its 2012 report the potential presence of "minor deviations" in the data published for the 2009 and 2010 reference years:

Gamesa does not consider it necessary to re-state any information from prior reports owing to corporate restructurings [3.10]. However, there could be minor deviations with respect to the quantitative data disclosed in 2009 and 2010 as a consequence of updates and adjustments. Likewise, there were no significant changes from previous reporting periods in the scope, boundary or measurement methods applied in the report. (Gamesa 2012, p. 135)

However, these supposedly "minor deviations" had a major impact on Gamesa's GHG emission inventory. When the data for 2010 in the reports published in 2011 and 2012 are compared, one finds an emissions difference of +12.6 for the EN16 indicator and of +77 % for the EN17 indicator. This important data adjustment is not mentioned in the reports. How can these important changes in the company's GHG inventory data be explained seeing that there were no "significant changes in the scope, boundary or measurement methods" (Gamesa 2012, p. 135)? Such concealment leads to the projection of a misleading image of the company's performance over time and raises doubts concerning the credibility and validity of the information disclosed.

In addition, many companies (e.g., Enagás, Repsol YPF and Royal Dutch Shell) changed their measurement protocols during the period analyzed, which leads to a great variability in their climate performance data. Modifying items such as emission factors can drastically affect the data in the GHG inventories. For example, for OMV, changes in the emission factors used to calculate emissions in 2012 significantly contributed to the fact its carbon footprint increased by 47 million tonnes of CO₂ equivalent. As specified in a footnote, "Around 90 % of the increase 2012 due to

updated emission factor for ‘other petrochemicals’; remaining 10 % of the increase due to minor changes to other emission factors” (OMV 2013, p. 80). A major problem caused by this type of modification is that many organizations do not adjust their data for their inventories for previous years. This lack of transparency limits even further the possibility of comparing the data over time for company GHG inventories. Manipulating the data in this manner allows companies to present a more optimistic description of their performance.

In summary, two major concealment strategies are used by the companies studied. The first strategy is to deliberately fail to communicate certain information regarding their climate performance. The second is to manipulate the presentation of numbers to influence the public perception of corporate performance and minimize the importance of changes in the measurement methods used to assess climate performance.

Discussion

The objective of this paper was to evaluate the quality of information disclosed by energy-sector companies and to explore the impression management strategies which they employ to justify or conceal evidence about their climate performance. This assessment of the reports’ compliance with GRI guidelines led to identifying significant gaps in the measurement of climate performance. These limitations of the inventories affect stakeholders’ ability to assess and compare climate data. In general, companies tend to conceal information concerning the methodology used and to present an incomplete carbon balance, particularly in terms of the sources of emissions taken into account. In most reports, data were presented in a manner that is confusing and inconsistent with the GRI requirements (2011c). This finding may appear surprising given the fact that all the reports studied were granted the highest level of application of the GRI guideline and were, in most cases, audited by external auditors. Companies also employed various impression management strategies to justify the results (by minimizing the impact of emissions, excuses and future commitments) or conceal information (through strategic omissions and manipulation of figures). As observed in previous studies of environmental disclosure, the selection and presentation of the data were manipulated to improve the company’s image (Boiral 2013, Cho et al. 2010, 2012b; Moneva et al. 2006).

Contributions

This study makes three important contributions to the literature on climate disclosure.

First, the paper contributes to the literature on the impression management strategies used in corporate narratives (e.g., Brennan and Merkl-Davies 2014) by analyzing the different strategies employed to justify or cover up evidence concerning climate performance. The concept of impression management strategies has been mainly applied at the individual level (Bolino et al. 2008, p. 1094), and its use in the research on companies’ climate performance has been very limited (e.g., Talbot and Boiral 2015). Moreover, research in this area has essentially focused on assertive rather than defensive impression management strategies (e.g., neutralization techniques), which are intended to repair or protect corporate image. With a few exceptions (e.g., Hahn and

Lülf 2014; Talbot and Boiral 2015; Boiral 2015), the concept of neutralization techniques (minimizing the impact, excuses and future commitments) remains little discussed in the literature on environmental and climate disclosure. The present study contributes to a better understanding of the role of neutralization techniques and concealment of information in climate disclosure. While some authors have studied the use of green communications as promotional tools (Domenech 2012; MacKay and Munro 2012; Nyberg et al. 2013), concealment strategies are still insufficiently studied and poorly theorized, especially in the field of GHG emissions disclosure. This manipulation involves a number of aspects, from selecting the data to presenting it. As observed in studies of environmental disclosure, companies tend to obscure damaging information (obfuscation) and present the information in a manner allowing to project a positive image (enhancement) (e.g., Merkl-Davies and Brennan 2007, Cho et al. 2010, 2012b). These strategic omissions and manipulations of numbers affect stakeholders' ability to assess climate performance.

Second, the longitudinal approach adopted in the study sheds more light on the evolution of disclosure practices over time. Various authors (e.g., Chu et al. 2013; Dragomir 2012; Freedman and Park 2014) have highlighted the importance of longitudinal studies in this area, and most researchers are quite optimistic about the improvement of the quality and reliability of information contained in sustainability reports (Dragomir 2012; Hahn and Figge 2011). This improvement seems related, in particular, to the learning process of organizations as they acquire more experience and knowledge of complex reporting practices through the implementation of performance indicators and development of sustainability reporting (Gond and Herrbach 2006; Igalens and Gond 2005). This study confirms that some improvement occurred in disclosure practices, in particular concerning the EN17 indicator. This indicator is related to scope 3 (other indirect emissions) and depends on various activities such as transportation, business travel or purchased goods and services. The measurement of the GHG emissions generated by these activities can be complex, and it requires learning new reporting practices. Generally speaking, however, the main findings of the study question the dominant optimism concerning the improvement of climate disclosure. Most companies still present non-compliant data (42.9 %) or justify non-disclosure of information (28.6 %) on the EN17 indicator to stakeholders. Moreover, greater disclosure of elements included in the EN17 indicator could reflect an impression management strategy intended to divert attention away from the negative aspects of the EN16 indicator—which covers the main sources of GHG emissions in the energy sector—through the release of more information on indirect and secondary sources of emissions. The study shows that all information on EN16 provided in sustainability reports is non-compliant with GRI standards. Furthermore, certain companies analyzed in this study produced reports which were ever more opaque as far as measurement and methodology are concerned. This practice, which was observed for six of the 21 companies studied (28.5 %), is worrisome since it significantly affects stakeholders' ability to assess the actual climate performance. To our knowledge, no study has systematically examined the evolution in the quality of climate data provided in GRI reports based on a longitudinal approach founded on counter-accounting for the information disclosed.

Third, the analysis of impression management strategies raises questions concerning the quality and reliability of climate information provided in A and A+ GRI sustainability reports. Some research has already been devoted to the problems of measurement and information comparability (Andrew and Cortese 2011; Dragomir 2012; Kolk et al. 2008; Sullivan and Gouldson 2012; Boiral

and Henri 2015). However, the present study is among the first to reveal significant gaps in the reports audited by a third party. Instances of nonconformity were identified in 90 of the 93 reports analyzed (96.8 %). In this light, the actual usefulness of the process may be questioned. The audited data hardly permit stakeholders to compare companies' climate performance and to analyze the evolution of their performance over time. As stated by O'Dwyer et al. (2005), if it is impossible to obtain valid and verified data, all information produced loses its value to stakeholders, notably the investors and policymakers. The results of the study confirm the findings of critical research on the unreliability of the sustainability reporting assurance process (e.g., Bebbington et al. 2007; Boiral 2013; Moneva et al. 2006). As pointed out by Talbot and Boiral (2013), the rigorous nature of this process seems to be a rational myth (Meyer and Rowan 1977) used to strengthen the legitimacy of companies, but it has no real impact on the quality of the information disclosed. At the same time, the study confirms the importance of building counter-accounts of climate data to identify information quality problems, including the measurement of climate performance (Apostol 2015; Boiral 2013; Milne and Grubnic 2011).

Implications and future research directions

The possibility of generalizing the results of this study is limited by its qualitative and exploratory nature. One of the disadvantages of qualitative content analysis is the fact that it is impossible to completely eliminate subjectivity in the interpretation of data (Mruck and Breuer 2003). To limit this factor, validation mechanisms such as double-coding procedures and confirming the understanding of the categories were employed (Miles and Huberman 1994; Thomas 2006). In future research based on assessments of companies' compliance with requirements, it would be worthwhile to present the results of the analysis to the companies in order to offer them the opportunity to justify their position. Such a validation process could increase the credibility of the data by permitting the companies studied to comment on the results and the researchers' interpretations of them (Thomas 2006; Dragomir 2012). Such a strategy would also enrich the literature on justification and concealment techniques by allowing for better contextualization of business decisions.

Regarding the verification of climate data and the opacity of corporate statements, the study is limited due the focus on GRI reports. Additional research should be conducted on documents produced in other contexts, such as companies' official statements under the European carbon market, the Western Climate Initiative and the CDP. Overall, the nonconformities observed in this study, in particular measurement problems or failure to take into account substantial sources of GHG emissions, can compromise the credibility of corporate and governmental climate commitments. Moreover, they raise the question of what value the information on GHG emissions represents for investors if it is impossible to ensure the validity and accuracy of the data. This lack of information validity can also affect the assessment of the achievement of corporate reduction targets. The instability of the measurement over time, which is caused in particular by the selection and presentation of non-representative data in the performance indicators, makes it difficult, if not impossible, to evaluate the actual performance of companies. The improvement of compliance and quality of information on carbon disclosure requires more rigorous verification practices in this area. Contrary to financial reporting, sustainability reporting and carbon disclosure are essentially based on a voluntary and unregulated approach. The results of our study suggest that the assurance

process by external auditors, which is often considered as a self-regulatory mechanism (e.g., Perego and Kolk 2012; Hess 2008), is not sufficient in itself to guarantee the quality and reliability of information. Public authorities could intervene to improve the expertise, professionalism and independence of external auditors through the development of new standards and recognized training programs on the verification process for sustainability disclosure. They could also enforce regulations to require companies to disclose reliable information on their GHG emissions and to make this information publically available. This information could be based on the GRI indicators (EN16 and EN17) and be verified by both external auditors and government inspectors. Such regulations would certainly improve companies' compliance and facilitate the implementation of policies based on the control of GHG emissions. In the same vein, NGOs and organizations such as the GRI could also play a watchdog role by verifying the compliance of GHG disclosure and sustainability reports in general. In principle, the assessment approach followed in this study could be applied by external stakeholders. Generally speaking, the development of counter-accounting based on publicly available information related to clearly defined GHG performance indicators would certainly represent a significant source of institutional pressure and encourage companies to improve the quality of sustainability disclosure. A better integration of data from the GRI reports, the CDP and other sources of information could also facilitate the verification of GHG disclosure. Although the CDP is based on questionnaires rather than clearly defined indicators that can be verified by external auditors, some information not available in the GRI reports may be reported in the CDP database. The same remark applies to other sources of information, including the company Web sites. Future research could analyze the compliance and quality of GHG disclosure from various sources of information, in particular the CDP. Nevertheless, this compliance assessment presupposes the existence of standardized indicators and well-defined reporting practices. As a result, it can be difficult to apply to information based on questionnaires and that coming from other sources, such as the company Web sites. Moreover, it seems unlikely that companies would decide to release information in compliance with the GRI indicators within the CDP framework while remaining non-compliant in their sustainability reports, including those verified by external auditors.

Finally, this study reveals serious shortcomings concerning the quality and comparability of data produced under the G3 version of the GRI standard. It would be worthwhile to carry out further studies on the compliance of sustainability reports with the new G4 version of the GRI (2013) which should be applied in GRI reports by December 2015 (GRI 2013). The new version of the standard in fact includes stricter requirements in terms of the measurement of indirect emissions (Scope 3). In particular, companies will have to disclose the sources of emission factors applied and specify the global warming potential (GWP) rates used (GRI 2013, p. 58). Paradoxically, given the greater complexity of indirect emissions, the G4 version of the GRI could have a negative impact on the compliance of climate information provided in the reports and thus encourage the use of concealment strategies observed in the G3 version. Moreover, it would be worthwhile to continue research on the evolution of information quality over time. Why do some companies justify failure to report certain information in such a superficial and evasive manner? What are the actual reasons for such failure to report information? Is it possible to observe significant differences in quality of data disclosed in the CDP compared to GRI? Can an improvement in the quality of information disclosed be observed in other sectors? These are some of the issues that should be further developed in future research.

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