Legitimacy Strategies in Corporate Environmental Reporting: A Longitudinal Analysis of German DAX Companies' Disclosed Objectives

Borgstedt, P., Nienaber, A-M., Liesenkötter, B. & Schewe, G.

Original citation & hyperlink:

Borgstedt, P, Nienaber, A-M, Liesenkötter, B & Schewe, G 2017, 'Legitimacy Strategies in Corporate Environmental Reporting: A Longitudinal Analysis of German DAX Companies' Disclosed Objectives' Journal of Business Ethics, vol (In-Press), pp. (In-Press).

https://dx.doi.org/10.1007/s10551-017-3708-y

DOI 10.1007/s10551-017-3708-y

ISSN 0167-4544

ESSN 1573-0697

Publisher: Springer

The final publication is available at Springer via http://dx.doi.org/10.1007/s10551-017-3708-y

Legitimacy Strategies in Corporate Environmental Reporting: A Longitudinal Analysis of German DAX Companies' Disclosed Objectives

Philipp Borgstedt[1] · Ann-Marie Nienaber[2] · Bernd Liesenkötter[1] · Gerhard Schewe[1]

Philipp Borgstedt
philipp.borgstedt@wiwi.uni-muenster.de

Ann-Marie Nienaber
ann-marie.nienaber@coventry.ac.uk

Bernd Liesenkötter
bernd.liesenkoetter@gmx.de

Gerhard Schewe
gerhard.schewe@wiwi.uni-muenster.de

1 Chair of Organization, Human Resource Management and Innovation, University of Muenster, Universitaetsstrasse 14-16, 48143 Muenster, Germany

2 Centre for Trust, Peace and Social Relations, Coventry University, Priory Street, Coventry CV1 5FB, UK

This is a green open access version of an article accepted for publication in *Journal of Business Ethics.*

For reference use: Borgstedt, P., Nienaber, A. M., Liesenkötter, B., & Schewe, G. (2017). Legitimacy Strategies in Corporate Environmental Reporting: A Longitudinal Analysis of German DAX Companies' Disclosed Objectives. *Journal of Business Ethics,* 1-24.

Received: 24 September 2016 / Accepted: 26 September 2017

Abstract

Ecological objectives in environmental reports usually promise a high degree of environmental awareness in a company's activities. Several studies have already highlighted that most companies do not keep their promises since stakeholders' expectations and a company's capabilities for internal adjustments do not match all the time. Thus, a company might use strategic reporting in order not to endanger its legitimacy. However, no study so far has demonstrated how companies use different legitimacy strategies in reporting their environmental objectives over time. To achieve this in our study, we focus primarily on findings from legitimacy theory in combination with the legitimacy strategies suggested by Lindblom (2010). To test our theoretical framework empirically, we analyze 260 corporate environmental reports between the years 2000 to 2014 of German DAX companies by coding all disclosed objectives within these reports. Based on this longitudinal approach we are able to identify reporting patterns of the different companies that provide insights into those companies' environmental reporting legitimacy strategies. Overall, this study contributes to research on voluntary disclosure by showing that a comprehensive analysis of the reporting pattern of disclosed objectives allows the identification of certain legitimacy strategies.

Keywords:

Corporate Environmental Reporting

Ecological sustainability

Environmental reports

Legitimacy strategies

Legitimacy theory

Transparency

Introduction

RWE, a large German electric utilities company, announced in its environmental report of the year 2007 that it would expand the installed power of renewable energies at its disposal by 4.5 gigawatts by 2012. This objective was pursued in the following years' reports; however, without any notification, *RWE* changed the target time for the objective to 2014 and reduced the extent to 4.3 gigawatts. In 2015, the actual installed power of renewable energies was 4.2 gigawatts only (RWE AG 2016). All changes made and the non-compliance with the objective were not communicated in any reports. Since we consider this reporting style as not transparent, the question arises whether RWE follows a strategic approach in its communication that is supposed to mislead stakeholders. Such an approach is often referred to as "greenwashing". Does RWE use greenwashing to legitimate its operations against stakeholders?

Legitimacy theory assumes that companies' survival depends on whether the society in which they operate recognizes that their activities conform to its value system or not (Gray et al. 1996). Thus from a strategic point of view, a company is able to influence its legitimacy status by communicating its behavior to its environment (Dowling and Pfeffer 1975). Several authors have differentiated these legitimacy strategies in substantive (actions are transformed to conform to social values) and symbolic (no transformation of actions but symbolling to conform to social values) (Ashforth and Gibbs 1990; Deegan 2006; Richardson 1985). Lindblom (2010) builds on this idea by further differentiating and explicitly describing four legitimacy strategies in regards to companies' corporate environmental reporting (CER)[1]. While the first legitimacy

[1] The wide variety of terms and definitions relating to non-financial/voluntary disclosure asks for an exact delimitation. In general, topics concerning corporate social responsibility are disclosed in corporate sustainability reporting, which usually includes the dimensions ecological and social, sometimes complemented by financial issues (for an overview, see Hahn and Kühnen 2013). Since we exclusively focus on the ecological dimension of voluntary disclosure, we use the term corporate environmental reporting (CER) hereafter. Yet, because CER is part of the larger concept corporate sustainability reporting, and to avoid inaccuracy, we us e the term CER also when authors were originally referring to both dimensions ecological and social. Likewise, when speaking of environmental reports as our research subject, this includes both pure environmental reports and sustainability reports in which we coded only environmental elements (Stray 2008).

strategy comprises honest and transparent communication of the stakeholders' requirements and needs that have been fulfilled by the company (substantive), Lindblom highlights three kinds of legitimacy strategies that try to manipulate stakeholders' perception and expectation of a company without making internal adjustments (symbolic).A company may not apply just one of these strategies in their CER but two or even all of them.

One key element of any CER are the disclosed objectives, which are statements about a future intention that contain a clear subject, extent and time period. As such, companies can use objectives to apply "greenwashing" on the pretext of informing stakeholders about future actions in regard to the ecological environment, because it is difficult for stakeholders to identify transparent reporting (Delmas and Burbano 2011; Fukukawa et al. 2007; Marquis et al. 2016). Whether companies communicate their objectives in a comprehensible and consistent way and, thus, report them transparently, is not part of any official audit. Although the Global Reporting Initiative (GRI) established certain principles for companies that call on consistency and comparability in reporting (GRI 2015), it does not evaluate if companies pursue the claimed objectives.

The question as to whether companies communicate transparently in their CER has been examined in a number of studies, but has not yet been comprehensively clarified (for an overview, see Hahn and Kühnen 2013). Researchers have highlighted that companies' CER is often characterized by a self-laudatory tone (Archel et al. 2008; Holder-Webb et al. 2009). Although the voluntary disclosure of negative aspects in environmental reports seems not to have an impact on stock price or investment decision (Reimsbach and Hahn 2015), scholars have shown that companies use impression management strategies to avoid transparency regarding these negative incidents (Criado-Jiménez et al. 2008; Hahn and Lülfs 2014). However, despite the intense research on transparency in CER, no study so far, to our knowledge, has focused on the identification of the strategic approach of demonstrating legitimacy when analyzing the transparency in terms of the disclosed objectives over time. This is remarkable because objectives play a decisive role when it comes to stakeholders' expectations. By disclosing objectives companies can show that their planned internal adjustments coincide with stakeholders' expectations (Parsons 1956a; Parsons 1956b; Suchman 1995). Furthremore, Ashforth and Gibbs (1990) show—from a theoretical perspective—the option for companies to disclose objectives in line with stakeholders' expectations, while actually pursuing objectives that are less acceptable to stakeholders. A company reporting this way can be clearly identified as not transparent in disclosing its objectives. In line with this, we state there is a high level of transparency when a company discloses and pursues its objectives in a comprehensible and consistent way over time (Nienaber et al. 2015).

This study focuses on the transparency of companies' disclosed objectives, which we analyze over a time period of 15 years to identify reporting patterns that lead to the company's legitimacy strategy. With the help of legitimacy theory, we design a theoretical framework that allows us to draw conclusions from the reporting patterns towards particular legitimacy strategies suggested by Lindblom (2010) when disclosing objectives.

To conduct this analysis, we use a qualitative content analysis of German DAX companies' environmental reports for the years 2000 to 2014. We focus on DAX companies because Germany has relatively strict regulation in terms of annual reporting and ecological standards, which allow us to work with a sample of environmental reports that are all governed by the same set of regulatory requirements. Our sample numbers 260 reports. Within these reports, we identify all disclosed objectives and code them according to three indicators: the level of transparency in CER objectives, which indicates how far a company pursues the disclosed objectives in a comprehensible and consistent way over time; the number of objectives that shows how ambitious a company discloses its objectives; and the thematic focus (topic) that helps to understand whether or not a company discloses objectives in line with stakeholders' expectations. The collected data is consolidated and assessed over the period of 15 years in order to evaluate each company's reporting pattern. This longitudinal approach is of great importance because stakeholders are not able to assess transparency themselves by reading only a single report, given that the objectives can be evaluated only after a delay of several years and with significant effort. Furthermore, we apply a cluster analysis in order to identify companies showing similar characteristics in their reporting of objectives.

Our results demonstrate that four groups of companies exist in regard to their reporting behavior: the *Signaler*, the *Greenwasher*, the *Unconcerned*, and the *Incapable*. We find evidence that most of the DAX companies apply, to some extent, legitimacy strategies when reporting objectives in their CER. While the *Signaler* report their success or failure in achieving their disclosed objectives mainly in a comprehensible and consistent way, we can identify a tendency in relation to some companies in the groups *Greenwasher* and *Unconcerned* to apply misleading strategies that are supposed to change the stakeholders' perception in regard to the companies' internal adjustments. For the companies in the group *Incapable*, we cannot reveal a clear strategy.

In sum, we make two contributions to research on voluntary disclosure. First, we apply the well-known legitimacy strategies by Lindblom (2010) on a particular element of CER, namely the disclosed objectives. This leads to a deeper understanding of the strategies used in CER. Second, we show that a comprehensive analysis of the objectives' reporting pattern in terms of transparency allow for further conclusions regarding the applied legitimacy strategies. In this way, we are able to examine the extent to which the four legitimacy strategies apply to our data..

In the following section on the theoretical background, we discuss strategies used in CER to reach the status of legitimacy. Then, we explain our methodological approach of data collection, coding and analysis over the time span of 15 years. Following, we reveal our findings and discuss them, before we highlight managerial implications and provide a short conclusion.

Theoretical background

Systems-oriented theories

In line with Gray et al. (1996), we take into account systems-oriented theories, which allow scholars to study the role of information and disclosure by examining the relation a company has to other companies, the government, individuals or groups. Systems-oriented theories are grounded on the idea that an organization is a part of a larger social system, which influences the organization in its practices and vice versa. Therefore, a company's disclosure practices are best understood when paying attention to an organization's context (Gray et al. 1996). In this study, we focus on the German DAX companies to ensure that all companies have the same context in terms of disclosure requirements, international activity, and level of sales and size. Three systems-oriented theories help to understand why CER is of relevance for companies: *Legitimacy theory* reflects how certain disclosure strategies are used by organizations to gain, maintain or repair legitimacy (Deegan and Unerman 2011; Suchman 1995). As such, this paper mainly builds on legitimacy theory. It is supplemented by *stakeholder theory* that deals with the expectations of an organization's CER by particular stakeholders (Freeman, 1984; Mitchell, Agle, & Wood, 1997) and *institutional theory* that focuses on the question of how organizational forms are adopted to bring legitimacy to an organization (DiMaggio & Powell, 1983; Meyer & Rowan, 1977; Smith et al., 2011). These theories complement each other in the analysis of an organization's disclosure practices with different levels of resolution of perception (Gray et al. 1995). In the following, we will describe these theories in detail.

Legitimacy theory has become one of the most cited theories within the environmental accounting area (Hahn and Kühnen 2013). This theory assumes that companies' survival depends on whether the society in which they operate recognizes that their activities conform to its value system or not (Gray et al. 1996). The idea behind this assumption is that an organization does not have inherent rights to resources. Thus, legitimacy granted by society gives an organization the right to use resources. According to legitimacy theory, a social contract exists between an organization and society. This social contract represents the external expectations that propose how an organization has to operate to receive social validation (Deegan and Unerman 2011). If a social contract is not fulfilled, legal, economic and social sanctions are the consequences (Dowling and Pfeffer 1975). For example, since the Japanese nuclear accident in 2011 both electric utilities within the DAX, *REW* and *E.ON,* are confronted with expectations to eliminate nuclear energy. Because the social contract is currently still not fulfilled, economic and legal sanctions have been implemented in Germany in recent years. CER is a tool an organization can use to legitimate its activities. Researchers, such as Laine (2010), Cho (2009), Tilling and Tilt (2010) and Lindblom (2010) have examined how companies use their CER to manage legitimacy. According to legitimacy theory, a crucial role of corporate disclosure is to legitimate the existence of a company (Lindblom 2010; Dowling and Pfeffer 1975). O'Dwyer (2002) demonstrates that Irish managers' prime motivation behind corporate disclosure is the enhancement of corporate legitimacy. Hopwood (2009) also found that companies use CER in order to increase their legitimacy or to facilitate a new and different image. A distance between stakeholders' expectations and internal adjustments is called a legitimacy gap (O'Donovan 2002). The gap arises from how stakeholders expect companies to act in comparison to how they perceive that companies do act (O'Donovan 2002; Deegan and Unerman 2011).

As explained above, CER has a strong link to stakeholders' expectations (*stakeholder theory*). Stakeholders' expectations are the reason organizations disclose information in regard to their environmental activities. Following Freeman (1984), we define a stakeholder as any group or individual who can affect, or be affected by, the achievement of a firm's targets. Stakeholders are the reason organizations have to disclose information at all—since they have to demonstrate the basis of their legitimacy. The observed pattern of voluntary disclosure is found to be consistent with the managerial branch of stakeholder theory (Oliveira et al. 2013). Stakeholders control resources a company may need to be successful. The more critical stakeholder resources are, the higher is the level of stakeholders' expectations that have to be addressed by the company (Roberts 1992). If an organization is not able to fulfil the stakeholders' expectations, it loses the basis of its legitimacy. Through voluntary disclosure, organizations can improve their reputation (an important resource for them) by negotiating with and influencing stakeholders. In Germany, the general topics that stakeholders expect from a DAX company are made explicit in a list published by the GRI. The GRI mentions 34 topics that have been declared as standard for companies when reporting their ecological activities (GRI 2015).

Institutional theory has been used primarily in organizational studies and explains how and why environments influence an organization to conform to external expectations. Organizations seek to demonstrate—for example by communicating—their activities in accordance with what is perceived to be appropriate behavior by the environment, e.g. stakeholders. Two key aspects of this theory are important for our study. First, Meyer and Rowan (1977) showed that external expectations and internal efficiency do not always conform with each other and thus organizations decouple their formal and informal activities to be perceived as acting in accordance with external expectations without harming internal efficiency. Second, following DiMaggio and Powell (1983), isomorphism mechanisms affect organizations. Coercive isomorphism drives organizations towards the practice of greater homogeneity to deal with pressure from society. Mimetic isomorphism refers to a company's tendency to imitate another company's structure or processes because of the belief that this structure or process is more beneficial than their own. Normative isomorphism describes how companies become similar due to pressure that stems from professionalization, e.g. similar education. Under institutional theory, an organization seeking social validation is expected to act in accordance with external expectations. Social validation is mandatory for an organization's legitimacy, and thus for it to achieve stability, access resources and to improve its chances of survival (Larrinaga-González 2007; Moll et al. 2006).

Strategic disclosure

In our study, we build on these three systems-oriented theories when analyzing how companies disclose objectives in their CER and thus show what kind of disclosure strategies these companies chose. According to legitimacy strategy, this choice depends on a company's disclosure aim—to gain, to maintain or to repair legitimacy (Suchman 1995). In the case of the regular and voluntary disclosure of DAX companies within their CER, companies usually aim at maintaining legitimacy. However, maintaining legitimacy is at risk when stakeholders' expectations cannot be fulfilled through sufficient internal adjustments. In this case, companies may want to mislead stakeholders in relation to their environmental practices.

If we look at legitimacy theory from a strategic perspective, companies are able to influence their legitimacy status through certain actions (Dowling and Pfeffer 1975). In CER, these actions are the way a company communicates its behavior in regard to the environment. A company might communicate either reactively or proactively (Lindblom 2010). Reactive communication is applied when a company has to respond to stakeholder complaints to narrow a legitimacy gap. Proactive communication aims at using regular disclosure to prevent a legitimacy gap arising. Companies use CER as the main tool for this regular disclosure.

When companies proactively address stakeholders' expectations, it is very important for them to disclose objectives in their CER. Lindblom points out that "the relevant publics continuously evaluate corporate output, methods, and goals against an ever evolving expectation" (Lindblom 2010, p. 52). Other researchers in the field of organizational legitimacy also highlight the importance of objectives that match stakeholders' expectations for maintaining legitimacy (Parsons 1956a; Parsons 1956b; Suchman 1995). However, taking a strategic perspective, it is important to address how companies use objectives to present themselves as legitimate to the stakeholders.

Lindblom (2010) distinguishes four proactive legitimacy strategies that, when reporting environmental issues, can be utilized by companies to maintain legitimacy. When defining these legitimacy strategies, Lindblom builds on the findings of institutional and stakeholder theory by relating the internal adjustments of a company to the external expectations of the stakeholder. In the following, we explain each of the four legitimacy strategies and show how they can be applied to CER's objectives.

Strategy 1. This strategy can be applied only when a company is actually able to fulfill the expectations of its stakeholders and make the internal adjustments that are reported. Thus, the disclosed objectives comply with those actual internal adjustments. In CER, we assume this strategy when a company reaches a high level of transparency through a comprehensible and consistent communication of objectives that meet stakeholders' expectations.

Strategy 2. A company might try to change a stakeholder's perception of its ecological measures when it is not able or willing to make internal adjustments. The strategy does not change the expectations of the stakeholders in general, but it affects the way the stakeholders perceive the company's internal adjustments, e.g. when the company states it is in close exchange with non-governmental organizations about crucial environmental topics. With regard to objectives, this strategy aims at making the stakeholders perceive a company to be strongly engaged in future ecological measures.

Strategy 3. A company tries neither to change stakeholders' expectations nor to perform internal adjustments. It manipulates stakeholders by associating itself with symbols having high legitimacy status, e.g. financing an environmental foundation. Thus, the disclosed objectives aim rather non-critical and symbolic topics instead of objectives covering actual areas of stakeholder concern.

Strategy 4. A company is able to decrease the stakeholders' expectations in general. This means expectations are denounced as wrong by informing and educating stakeholders about a crucial topic, e.g. that the costs of further investment in pollution reduction are higher than those disseminated by the media and that this investment might lead to staff reductions. Thus, a company aims to downgrade its stakeholder expectations by for example an incomprehensible or confusing communication of objectives (e.g. several changes in relation to the or disclosing objectives in all areas that seem to be rather irrelevant for a company's ecological engagement.

Within their CER, companies may use any of these strategies when reporting their ecological effort. Following Lindblom (2010), it is also possible that companies might use a combination of all four strategies. We summarize our theoretical framework in figure 1.

---------- Insert figure 1 here ----------

Systems-oriented Theories

Legitimacy Theory	
Stakeholder Theory	Institutional Theory

Legitimacy Strategies by Lindblom (2010)

Strategy	**Application in voluntary disclosure (Hahn and Lülfs 2014)**	**Application in voluntary disclosure of objectives**
1	Make internal adjustments and communicate them.	Disclose objectives that comply with actual internal adjustments.
2	Demonstrate appropriateness of output, measures etc. without making internal adjustments.	Change stakeholder perception by disclosing objectives that promise an overly positive engagement with regard to future ecological measures.
3	No change in business performance nor in societal expectations but manipulating perception by associating with symbols having high legitimacy status.	Disclose objectives aiming at non-critical and symbolic topics only instead of objectives covering actual areas of stakeholder concern.
4	Change stakeholders' expectations through education and information.	Influence stakeholders' expectations downward through incomprehensible communication or irrelevant topics in disclosed objectives.

Data and methods

Analytical approach

In order to gather the relevant data from the environmental reports, we analyzed the reports using qualitative content analysis to extract all disclosed objectives. The predefined procedure of qualitative content analysis ensures a consistent and comprehensive collection of the data (Krippendorff 2004). We sorted the extracted objectives and tracked them through the reports until they are either reached or cancelled. Furthermore, we used a cluster analysis to show particular pattern in CER of our sample (Aldenderfer and Blashfield 1984) that allowed for further conclusions within our analysis regarding the legitimacy strategies applied.

Sample

Our sample includes all available environmental reports published from the years 2000 to the year 2014 inclusive from all companies that were listed in the German DAX 30 stock index. The cut off date was August 20, 2015. The DAX comprises the 30 largest German companies in terms of order book volume and market capitalization. The reasons for choosing this sample are described in the following. Management research defines two main internal determinants of companies that influence CER: (1) size and (2) industry (Fifka 2013). (1) Studies have shown a positive correlation between company size and tendency to disclose environmental reports (e.g. Adams et al. 1998; Guthrie and Parker 1989; Hahn and Kühnen 2013; Thorne et al. 2014). Thus, targeting an adequate sample, the 30 biggest companies in Germany represents an appropriate group. Since German stock companies are subject to certain statutory disclosure requirements, we can assume that these companies are experienced in systematic ecological reporting. Both selection criteria ensure a suitable sample size and a high degree of regularity of reporting, which facilitates the extraction of significant and comparable results. (2) Industry affiliation is the second main factor influencing extent and quality of CER (Beresford and Feldman 1976; Bowman and Haire 1976; Esrock and Leichty 1998). While we strive for a homogenous sample in terms of company size, we deliberately accept a heterogeneous group regarding industry affiliation. This is due to the reason that objectives in CER are still an under-researched area and we therefore want to obtain data from a variety of industries to reach generalizable results (for similar approaches, see Bansal and Roth 2000; Sweeney and Coughlan 2008). Since the DAX companies cover a wide range of industries (Hahn and Lülfs 2014), our findings are broadly applicable.

In August and September 2015, a total of 260 reports were procured from corporate websites, through personal requests or a web search. As not all selected companies disclose in the same form, we applied the following inclusion and exclusion criteria to make sure that the reports were comparable to each other. First, besides common stand-alone environmental reports, we also included integrated reports in our sample. Integrated reports combine annual reports and environmental reports and are an approach to link financial and non-financial figures and topics (Milne and Gray 2013). To be included in our sample, further requirements of a report were that it had to apply to the entire corporate group and that it had to be published in a format that cannot be changed subsequently (e.g. printed booklet or PDF document). In accordance with the latter restriction, website-only versions of environmental reports were not included in the sample as they are not suitable for a longitudinal analysis for two reasons. First, unlike printed reports, the disclosing company can subsequently change data on websites. Second, websites, especially from the beginning of the observation period, are often no longer available.

The final sample consists of 25 companies that disclosed 260 environmental reports (see Appendix 1 for an overview). Five companies in the DAX were not included in the sample, namely *Fresenius Medical Care*, *Fresenius*, *SAP*, *ThyssenKrupp* and *Deutsche Börse*. The first two companies did not provide any detailed environmental reporting that we were able to analyze. *SAP* and *ThyssenKrupp* report only online on their websites. *Deutsche Börse* disclosed environmental reports that we were able to analyze, but did not issue any objectives.

Data collection

Due to the large quantity of text, a structured approach to gather the data is required. The method of qualitative content analysis allows large amounts of content to be codified into various categories, and, based on certain criteria, themes or patterns to be identified (Krippendorff 2004; Weber 1990). A key criterion for our study is that each coded text passage consists of an actual objective. Based on defined characteristics for objectives (discussed in the following paragraphs), qualitative content analysis allows this kind of specific data to be collected in a replicable and valid way (Krippendorff 2004). Referring to Mayring (2015), we conducted the qualitative content analysis as described in the following.

We developed a codebook that included all ecological dimensions for all company types. The categories were derived from the *Sustainability Reporting Guidelines Version 4* of the Global Reporting Initiative (GRI 2015), as 23 of the 25 companies in our sample use these guidelines to ensure accountability (see Appendix 1). Within the section *Environmental,* the GRI subsumes twelve single categories[2] that companies should report in. All these categories were included in our codebook to achieve a consistent and contemporary approach. Due to the high number of coded objectives in the categories *Energy*, *Emissions*, *Products and Services* and *Supplier Environmental Assessment*, we further subdivided each of these into several sub-categories (see Appendix 2). Following Nienaber et al. (2015), we added two categories for objectives that are not covered by the GRI: *Strategic Projects* and *Monitoring*. The category *Strategic Projects* contains objectives in which the companies plan to anchor in the organization a certain strategic approach regarding ecological sustainability. The objectives that deal with the control of ecological sustainability are subsumed within the category *Monitoring*.

[2] The GRI labels these twelve categories "aspects", while the aspects are summarized in the "categories" Economic, Environmental and Social. However, to achieve a clearer naming system, in this paper we are always speaking of categories. Each objective is classified in one category. All categories form the category system.

For our analysis, we used three different indicators to reveal the reporting pattern of a company, which allowed us to derive conclusions in relation to the applied legitimacy strategy. First, we analyzed the level of transparency, which shows whether the company pursued the disclosed objectives in a comprehensible and consistent way over time. The figure determines the ratio of objectives that were reported transparently instead of not transparently by each company. Second, for each company, we counted the number of objectives disclosed in order to see how ambitious a company was in its reporting. Third, following the described system of thematic categories above, we analyzed the objectives of each company in relation to content, which means that we compared their chosen objectives' topics with common stakeholders' expectations. We categorized stakeholders' expectations in line with the approach by Reverte (2009) and Kilian and Hennings (2014), who differentiate high-, medium- and low-controversy industrie in terms of environmental impact. This means, the more controversy a company is, the higher are the stakeholders' expectations towards the company's CER

Based on the combination of the three indicators, the study aims at identifying legitimacy strategies used by the companies in their disclosed objectives. For the first strategy, it is necessary that an objective is reported transparently. Additionally, it should thematically be in the focus of stakeholder interest and should demonstrate the motivation of a company to achieve an environmental benefit. The second legitimacy strategy is characterized by not transparent disclosed objectives in topical areas of stakeholder concern. Due to high stakeholders' expectations, the objectives are too ambitious and thus, hardly achievable. We expect the second legitimacy strategy to be applied when a company discloses a number of objectives that are reported consistently over several years, but at some point, not mentioned anymore, often shortly before due date. The third legitimacy strategy depends primarily on the number of disclosed objectives targeting sensitive topics of high stakeholder interest. The fewer objectives of sensitive topics are disclosed, the higher is the likelihood of the presence of legitimacy strategy three. Finally, the fourth legitimacy strategy is characterized by a reporting pattern that aims at a downward influence of stakeholders' expectations, which can be identified by low levels of transparency and content-related irrelevance.

Data analysis

For our coding we used the data analysis software MAXQDA. In order to ensure a high quality in our approach, we applied several coding rules: First, in line with Nienaber et al. (2015) and Schewe et al. (2012), we coded only those statements concerning ecological intentions that can be clearly identified as objectives. This means a company explicitly reports which result is supposed to be achieved on which basis at a certain time in the future. Therefore, the elements subject, extent and time period of a statement have to be coded. If one of these three elements was not available, we classified those kinds of statements as "intention", and did not include them in our analysis. An example of a clear target can be seen in the case of *E.ON*, which stated in one of its reports that the company wanted to achieve a decrease of its carbon dioxide emissions (subject) by 50% (extent) between 1990 and 2030 (time period) which belongs to the GRI category: CVB .A second coding rule is that we did not code objectives that refer to a specific division of the company or a particular region. These objectives do not ensure a proper comparison of the companies in our sample. Third, we included only those objectives that applied for a period of more than two years. That means we excluded those targets that applied for a very short period, since we are interested to see whether companies report transparently over several years (longitudinal approach).

In order to assess the level of transparency of CER over the 15-year period, we applied a procedure that allowed us to identify inconsistency in reporting objectives over time. This aim prohibits the use of a simple scoring model as applied in previous studies (e.g. Aerts and Cormier 2009; Al-Tuwaijri et al. 2004; Cormier and Magnan 2003; Wiseman 1982). Kolk (2004) showed that a profound assessment of transparency has to go beyond the statements *reported* or *not reported* in respect of certain dimensions regarding sustainability. We therefore proposed a more complex method of analysis that did not assess the objectives per year but rather over a period of time. An objective that was mentioned for the first time in an environmental report was evaluated by its indication in following reports. This means that we classified the reporting of an objective as transparent when the objective was pursued over the next several years until it was attained without a negative change of subject, extent, or time period. It is important to note that this approach does not intend that all objectives claimed to be transparent had to be achieved. Changes of subject, extent, or time period were allowed as long as this was explained transparently in the relevant report. Furthermore, we want to emphasize that our evaluation of transparency and applied legitimacy strategy of a company is always a relative indication in comparison to the other companies in the sample.

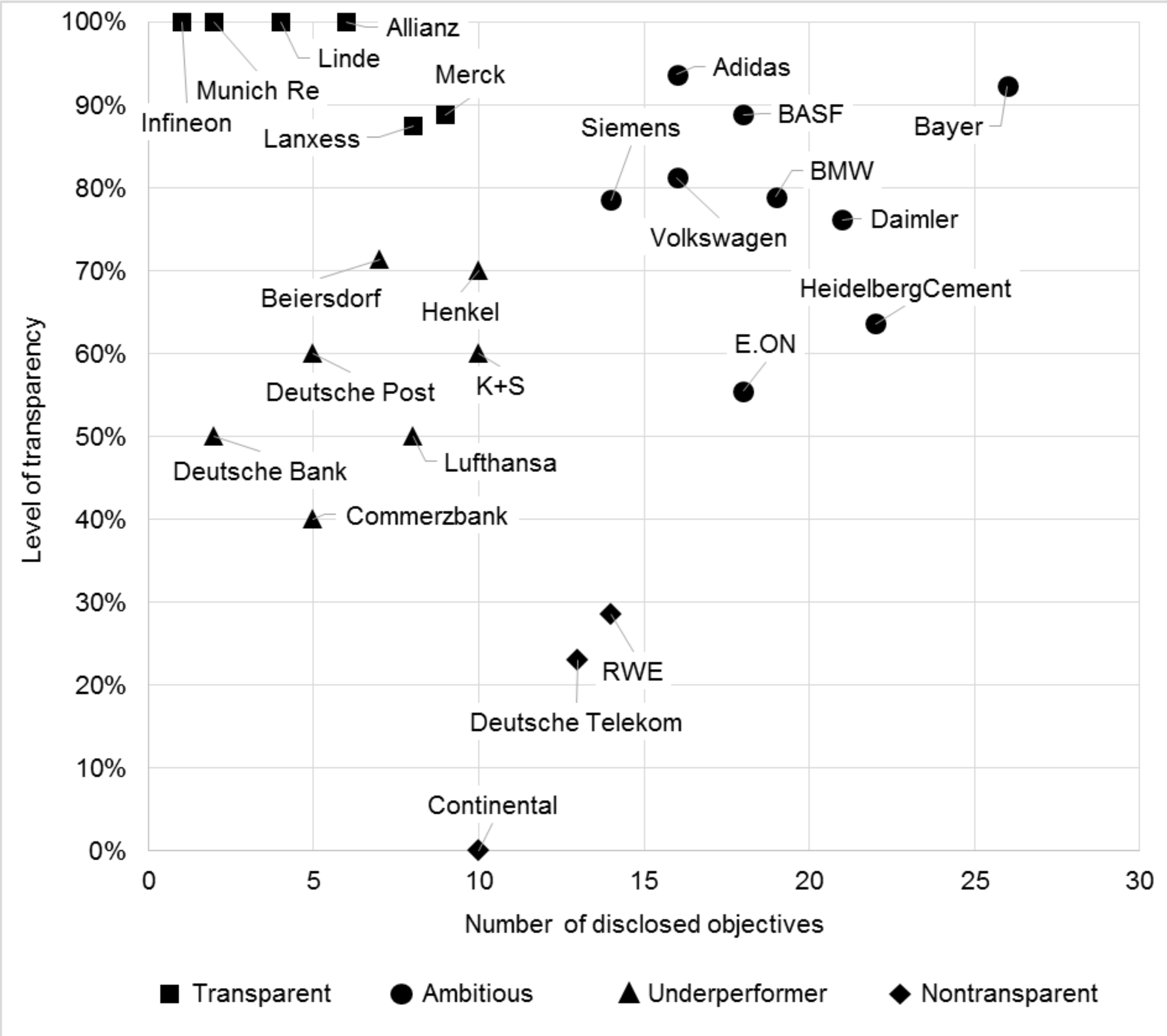
The analysis was done by two separate coders (research assistants). The first research assistant coded 20% of the reports. Based on this initial coding, the code book was modified in coordination with the second research assistant (Strauss and Corbin 1990). The first research assistant then coded all reports. A memo containing operational definitions, coding rules and sample report quotes was written for each category. The second research assistant independently coded 20% of the overall data. The percentage agreement between the two coders reached a satisfactory level of 78.1%.

Cluster analysis

A cluster analysis identifies relatively homogeneous groups based on particular characteristics of the objects (Hair et al. 1998). The clusters show similarities within a group, and divergences between the groups (Aldenderfer and Blashfield 1984). For our analysis of disclosed objectives, it was important to work out the commonalities and disparities among and between the companies in our sample. As described above, we use three indicators that help to identify particular legitimacy strategies of the companies within the sample. Because only two of the three indicators are quantifiable (level of transparency and number of disclosed objectives), we use these two indicators in the cluster analysis. This approach allows for a reduction of complexity since the companies in the clusters have similar characteristics. The analysis of the objectives with regard to their thematic focus (third indicator) support the identification of legitimacy strategies on both company and cluster level. Thus, the combination of all three indicators were the basis for our assumptions in regard to the application of a particular legitimacy strategy. We describe the precise procedure of our cluster analysis in the following.

First, we checked for potential outliers by assessing the levels of (dis)similarities by means of the squared Euclidean distance. We applied Ward's method, one of the most common methods when applying cluster analysis (Dolnicar 2003; Du et al. 2015). The method belongs to the hierarchical approaches group of analysis and aims at minimizing the variance within a cluster (Aldenderfer and Blashfield 1984; Ward 1963). Because both our indicators, level of transparency and number of objectives disclosed, had different scales and means, we standardized to z scores. We identified four clusters by checking typical criteria such as the coefficient of error, sums of squares and the dendrogram. These clusters showed a satisfactory internal homogeneity and good distance values between each other (see Appendix 3). Four groups result from our cluster analysis. Figure 2 shows all companies in line with (a) the total number of objectives disclosed by each company (x-coordinate) and (b) the share of objectives that are reported transparently instead of not transparently (y-coordinate) – the subjects of the different objectives are shown due to complexity and a better structure separately in each cluster.

---------- Insert figure 2 here ----------



In the following, we show our findings in regards to the applied legitimacy strategy for each group of companies to reduce complexity when analyzing all 25 companies over the time span of 15 years. For this main analysis we have to take all three indicators into account since otherwise we are not able to identify specific pattern in CER that lead towards a particular legitimacy strategy the companies in a group seem to apply.

Findings

Cluster 1 - Signaling

Overall, the 25 companies in our sample disclose 284 objectives, which is an average of 11.4 objectives per company. Of all objectives, 69.4% are reported transparently. The first group (in the top left corner of figure 2) is characterized by a relatively low number of total objectives (fewer than ten) and a high level of transparency of more than 85%. Therefore, we call this group *Signaler*. This group includes six companies: *Allianz*, *Infineon*, *Lanxess*, *Linde*, *Merck* and *Munich Re (see Table 1)*. It is the most homogenous group regarding the number of objectives and the level of transparency in regards to their CER. The objectives' topics in regard to the categories mentioned in the GRI seem to be focused on those with great relevance for stakeholders nowadays, e.g. *Energy* (*Energy Consumption* and *Use of Energy from Renewable Sources*) or *Greenhouse Gas Emissions* (United Nations 1997). Thus, these topics can all be rated as highly relevant.

Company	**Main sector**	**Stakeholder expectations with regard to environmental disclosing**	**Level of transparency**	**Number of objectives disclosed**	**Top 3 topical areas of disclosure**		
Allianz	Insurance industry	low	100%	6	Emissions / Greenhouse gas emissions	Energy / Use of energy from renewable sources	Energy / Energy consumption
Infineon	Semiconductor industry	low	100%	1	Emissions / Other significant air emissions	-	-
Lanxess	Chemical industry	high	88%	8	Responsibility for products and services / Usage	Emissions / Greenhouse gas emissions	Energy / Energy consumption
Linde	Industrial gases and plant engineering	middle	100%	4	Energy / Energy consumption	Energy / Use of energy from renewable sources	-
Merck	Chemical and pharmaceutical industry	high	89%	9	Responsibility for products and services / Usage	Emissions / Greenhouse gas emissions	Waste

Based on these reporting patterns, the question is what strategy does this group apply in their CER? First of all, it seems that the companies want to demonstrate quality for quantity—which means firstly, they report about topics that are highly relevant for their stakeholders, and secondly, disclose rather few objectives but want to follow up on those disclosed objectives. In relation to the first point, we see that each of the six companies discloses at least one objective in the categories *Energy Consumption* and/or *Greenhouse Gas Emissions*. Although the particular level of expectations of the stakeholders for the different companies in cluster one differ (high, medium and low), we can see that the companies in this group disclose objectives in topical areas of large stakeholder concern. Topics in those two fields are very important in general to all stakeholders and therefore companies should fulfill stakeholders' expectations in these areas. With regard to the second point, chemical and pharmaceutical company *Merck* gives a good example for the transparent reporting approach. In the year 2002, *Merck* discloses the objective to *increase the recycling rate of waste to 57% by 2010*. The company pursues this objective transparently and is able to report its success in the year 2010, even overachieving by 5%. Thus, the general level of transparency in CER is relatively high in this cluster. Altogether, these findings lead to the assumption that the companies in this group predominantly try to apply the first of Lindblom's legitimacy strategies. The companies disclose well-chosen objectives that they are able to internally adjust and, thus, fulfill stakeholders' expectations. Hence, based on the idea of stakeholder theory, this group is an example of transparent CER towards its stakeholders. The consistency within the objectives demonstrates further that these companies do not want to manipulate their stakeholders but rather to demonstrate their trustworthiness and their right to exist.

Cluster 2 - Greenwashers

A second group (top right corner), labeled *Greenwasher*, comprises companies with a relatively high number of published objectives compared to the other groups (minimum of 14) and a share of transparently to not transparently reported objectives greater than 55%. It is the biggest group, with nine companies, namely *Adidas*, *BASF*, *Bayer*, *BMW*, *Daimler*, *E.ON*, *HeidelbergCement*, *Siemens* and *Volkswagen*.

The group *Greenwasher* is the largest group in our sample, containing nine companies (36% of the whole sample). These nine companies release a total of 170 objectives (more than 60% of all objectives in our sample). On average, each company in this cluster reports 18.9 objectives (seven more than the sample average). The highest number of objectives is published between the years XC in periods two (69 new objectives) and tX hree (80 new objectives) (see appendix figure 1). A clear advise that these companies seem to apply greenwashing is that, despite the increased number of objectives, the companies are able to enhance their level of transparency in both periods. In period two 70% of objectives are reported transparently; and 89% in period three. With an overall group transparency level of 79%, the *Greenwashers* report at least on the second-highest level of transparency of all groups. Thus, we assume that this companies are aware of the fact that CER is important but try to cover their sometimes less ambitious behavior in regards to environmental issues. Another fact that we identified considering the companies of this group is that the Greenwashers do not focus on the critical topics in their CER. Instead, we can see that the group covers the full list of GRI categories. This finding underlines our assumptions that this groups tries to confuse their stakeholders with a hugh amount of objectives but with not all being in the critical areas of environmental challenges. This assumption becomes even more evidence when we take the particular topics into account the companies report about. Besides a number of objectives in the highly topical categories *Emissions* (*Greenhouse Gas Emissions* as well as *Other Significant Air Emissions*) and *Energy Consumption,* all but two companies (*Daimler, HeidelbergCement*) in this group also report in the category *Water,* a topic having rather little stakeholder attention.

Within this group, *BMW* seems to be a good example to demonstrate the group's CER, since BMW meets the absolute average (19 objectives; 79% transparency level, and topics that cover the full range of the GRI categories). In most cases, BMW is transparent in the ways objectives are reported to stakeholders. For example, the objective to *reduce waste water by 30% (based on 2006)* is disclosed in 2008 and fulfilled in 2012. Subsequently, *BMW* publishes a follow-up objective, this time a *reduction of 45% waste water (based on 2006) by 2020*, which is reported transparently until the cut-off date for this study. In contrast to *BMW*, *Bayer* and *E.ON* occupy respectively the upper and lower levels in regard to transparency level in this group but target all the whole range of GRI categories. Reaching a level of transparency of over 90%, *Bayer* is on the same level as the companies in the group *Transparent*. However, *Bayer* discloses 26 objectives—a considerable number—over all three periods and thus is much more ambitious compared to the companies in the group *Transparent*. *E.ON* discloses 18 objectives, but the transparency level of 56% is rather low (group average 79%). A total of eight objectives are evaluated as not being transparently reported over the time period. Detailed analysis of the individual objectives reveals that each of the eight goals lacking transparency is directly or indirectly associated with climate protection. This topic is of special relevance for *E.ON* as an electric utilities company, because the company's power plants emit large amounts of carbon dioxide. As the public's attention to climate change increases over the observation period, the company needs to report carefully. One example demonstrates relatively well *E.ON's* typical reporting pattern. In 2005, the company claims it would *invest five billion euro in renewable energy by 2015*. Although *E.ON* tracks this objective in the following years, the reporting stops in 2009 and 2010 without further explanation. In 2011, the objective is resumed with a due date of 2016 and a total investment of now seven billion euro. The same objective is changed again in 2013 without any comment to a yearly investment sum of 1.3 billion euro in 2014.

Based on these findings, we have to draw a rather complex picture in terms of this group's strategy in CER. As all companies publish a very high number of disclosed objectives and a relatively high percent of transparency, it seems in the beginning that most companies apply legitimacy strategy one, but when we have a closer look at the topics the companies target with their disclosed objectives, we have to change our first impression. Firstly, all companies target the whole range of GRI categories when analyzing their disclosed objectives. That means CER includes objectives of low, medium and high relevance for stakeholders. These hugh amount of objectives may confuse the stakeholders since he is not able to identify the really important ones any more due to the mass. Secondly, we are able to see tendencies towards the fact that this groups meats their stakeholders' expectations in particular with objectives that are not that critical and thus, relatively easy to achieve. The disclosed objectives in the really critical topics are often times not fulfilled. However, due to the amount of disclosed objectives these objectives do not have such a big influence on the level of transparency in general. Thus, the companies look in the first instance relatively transparent but not at the second glance. *E.ON*, for example, discloses a number of objectives that highlight renewable energy projects, whereas no objective is reported regarding nuclear power, although it is one of *E.ON's* key sources of energy. This allows us to assume that the third legitimacy strategy might be applied. This kind of strategy uses reporting to manipulate stakeholders' perceptions by talking about noncritical topics. This impression is underlined by another fact. Against the background of climate change and the nuclear accident in Japan in 2011, stakeholders' expectations have strongly changed for electric utilities within the period under review. We assume that *E.ON* is on the one hand not able to fulfill its stakeholders' expectations (which can be seen by a low transparency level) and thus tries to change stakeholders' perceptions by applying the second legitimacy strategy. However, other examples, in this group may soften this impression. *Bayer's* disclosed objectives show only small failures, and those made seem coincidental rather than purposeful. Therefore, we assume negligent reporting instead of a manipulative strategy and thus, legitimacy strategy two has to be considered. Therefore, the companies in this cluster apply two of Lindblom's legitimacy strategies, namely strategy two and three.

Cluster 3 - Unconcerned

The companies in the third group (middle left area) labeled *Unconcerned*, show a similarly small number of disclosed objectives as the *Signaler* group. But in contrast to the *Signaler* group, these companies are characterized by a considerably lower level of transparency (40-70%). Seven companies form this group: *Beiersdorf*, *Commerzbank*, *Deutsche Bank*, *Deutsche Post*, *Henkel*, *K+S,* and *Lufthansa*.

The third group consists of seven companies that are characterized by a relatively low number of objectives (6.7 on average), a below-average level of transparency (60%), and a confusing picture in relation to the topics in CER compared to the rest of the sample. Due to the relativel vague picture and no particular tendency towards the number, topic or level or transparency in their disclosed objective, we all this group the Unconcerned. Obviously this group has not yet recognized how important a transparent CER might be for stakeholders. However, it is also important to point out that the low numbers of disclosed objectives are not steady over time. The group shows a strong increase from a 0% level of transparency in the first period to 68% and 73% in periods two and three respectively. Also the number of objectives rise noticeably. Considering the topics this group covers, we see that all companies but one disclose at least one objective regarding *Greenhouse Gas Emissions*, which is in line with the findings in the other three clusters. Besides, it is noteworthy that *Lufthansa* discloses five of its eight objectives in the category *Responsibility for Products and Services*. Thus, we can assume that this group may become more concerned towards the importance of a consistent CER, but that they are still in the beginning phase of realizing this.

Our analysis of the objectives for the group *Unconcerend* reveals a number of examples in which companies in the group frequently fail to pursue clear objectives in relevant topics consistently over time. One example is the chemical company *K+S*, which, in the their environmental report of 2008, announces an aspiration to *increase investments in water protection by up to 360 million euro in order to halve the amount of salt water in the production process by 2015*. The company reports this objective transparently until 2012. After 2012 the objective is not pursued any more, and without any further explanation. Additionally, water protection is considered as important on a low level by their stakeholders and thus, not of great relevance anyway. Another example relates to the logistics company *Deutsche Post*. In its 2008 report the company announces it would *replace 90% of its own air fleet with more economical models by 2020*. However, the objective is not tracked in the following report. In 2010, the company follows up on the objective but with changed numbers. Their new target is to *replace more than 15% (reference year 2009) of the air fleet by 2015*.

The overall evaluation of this cluster regarding its use of legitimacy strategies is rather difficult and shows a fuzzy picture. The companies reveal a below-average level of transparency, and targeting topics with their disclosed objectives that do not show any pattern and are not of high relevance for their stakeholders. Although, we can identify a positive trends towards the number and transparency level of their disclosed objectives, the topics choice has not become better. However, objectives are still often cancelled or changed without notification. This is particularly noteworthy as the number of objectives is comparatively low. It appears that the industry of which the companies in this cluster are members plays a decisive role. For the two companies in each of the banking (*Deutsche Bank*, *Commerzbank*) and consumer goods (*Beiersdorf*, *Henkel*) industries, we see relatively low stakeholders' expectations due to a rather small environmental impact (see Appendix 4). However, the companies do not reach a high level of transparency because of negligence in the reporting of the objectives. Furthermore, for a few objectives we find signs that stakeholders are consciously mislead (legitimacy strategy two). Stronger indications for the second legitimacy strategy are apparent for the logistics company *Deutsche Post* and the chemical company *K+S*. We can see in these examples that both companies disclose objectives in topic areas that are strongly marked by high stakeholders' expectations. Stakeholders expect *Deutsche Post* to reduce emissions relating to its logistics operation, which the company tries to meet by disclosing the objective described above. The way this objective is communicated (ambitious outcome, cancelled without notification after one year) is a clear indication of the use of legitimacy strategy two, meaning that the company discloses an objective according to stakeholders' expectations without sufficient internal adjustments. *K+S* is confronted with high stakeholder pressure (see Appendix 4), which stems mainly from local residents due to the pollution of adjacent rivers. Their objective to invest in water pollution control is cancelled without notification close to the due date. This reporting pattern also suggests a strategy aiming at misleading stakeholders by changing their perception of the actual internal adjustment (legitimacy strategy two). In sum, the companies in cluster three show a rather fuzzy picture in their reporting. We find indications for negligent reporting of objectives that does not follow any strategy. In addition, we identify some companies that use the second legitimacy strategy to change stakeholders' perception of the company's internal adjustment.

Cluster 4 – Incapable

Lastly, the three companies remaining are characterized by a level of transparency of less than 30% (bottom of figure 1). Due to the low level of transparency, we call this group *Incapable*. Its members are *Continental*, *Deutsche Telekom* and *RWE*. Each of these companies disclose between ten and 14 objectives.

The last group is called *Incapable* because a very low level of transparency (less than 30%) and no pattern at all in their chosen topics they communicate. All three companies in this group are characterized by this messy picture. *RWE*, *Continental* and *Deutsche Telekom* publish ten objectives on average and achieve a group transparency level of only 20% in topics that are sometimes of high relevance for their stakeholders such as Greenhouse Gas Emissions and sometimes of very low relevance, e.g. Waste. Furthermore, we can see that although the companies disclose a considerably lower number of objectives in the third period (six objectives) compared to period two (17 objectives), the transparency level of reporting decreases from 29% to 17% in the respective periods. Looking at the topics the three companies in the cluster target, we can highlight the categories *Greenhouse Gas Emissions* (five objectives by *RWE*) and *Energy Consumption*. A high number of objectives are also disclosed in the category *Waste* (*Continental*: 4; *Deutsche Telekom*: 3).

The companies within the *Incapable* group produce many examples of insufficiently transparent reporting in different topics. In 2007, *RWE*, the second electric utilities company in our sample, discloses it would *expand the installed power of renewable energies by (1) 4.5 gigawatts by 2012 and (2) up to 10 gigawatts by 2020*. The latter objective is tracked only until

2009. Afterwards, there was no follow up at all. For the first objective, in 2010 *RWE* extends the targeted time period to the year 2014 without any comment. In 2013, the objective is adjusted again but this time in relation to its extent: in particular, the level of installed power of renewable energies is changed from 4.5 to 4.3 gigawatts. This kind of reporting allows us to assume that *RWE*, like *E.ON*, is faced with changing stakeholders' expectations due to external challenges that threatened the business model, mainly from climate change and the nuclear phaseout in Germany. Furthermore, we are also able to identify another pattern of CER. *RWE* does not disclose a single objective that related to the topic of nuclear energy, whereas renewable energy projects are highlighted several times (three objectives). Additionally, we identify a company that does not pursue a single objective transparently: automotive supplier *Continental*. A first wave of four objectives is disclosed within the annual report of 2007, namely *a 5% reduction of each of energy consumption, water consumption, carbon dioxide emissions and waste volume by 2012*. While *Continental* pursues these objectives in the following report, they pay no attention to them in the years 2009 and 2010. In the reports from 2011 onwards, *Continental* revives these objectives, but repeatedly changes the extent and time period.

Based on the analysis of the reporting pattern, we can draw different conclusions regarding the use of legitimacy strategies in this cluster. Again, the industry field plays a decisive role when disclosing objectives because of the topic that is of relevance for the company's stakeholder. As a telecommunication company, *Deutsche Telekom* has to expect comparatively low stakeholders' expectations regarding environmental issues (see Appendix 4). They disclose a number of achievable objectives, which they appear to report relatively carelessly. All topics are of little interest for their stakeholders and thus, the whole reports seem to be rather a shield to avoid any higher stakeholder expectations. Showcasing the achievement of objectives but in an industry field that maybe is not that decisive for the environmental wellbeing or in topics that are not of high relevance for the stakeholders, just want to achieve low stakeholders' expectations or maybe even downgrade stakeholders' expectations. Downgrading because on the one hand Telecom demonstrates that its industry is not really able to do something to save the environment in general and on the other hand demonstrates with achieving their objectives in rather less important fields their positive engagement. Both leads to lower stakeholder expectations for the future for this company's ecological engagement. And thus, let us assume that this group applies legitimacy strategy four.

This leads to a nontransparent CER, but seems not to follow any of Lindblom's legitimacy strategies. Automotive supplier *Continental* discloses the objectives of achieving reductions in four areas by five per cent. The fact that the these are general objectives of always 5%, which are disclosed in very different topical areas, might be an indication towards the use of the second legitimacy strategy, especially when considering that *Continental* faces increased stakeholders' expectations (see Appendix 4). However, the objectives are communicated in a very confusing manner, so that we do not assume the use of an actual strategy here. For *RWE* our results point to the use of the second legitimacy strategy. The company is confronted with relatively ambitious stakeholders' expectations. Although the second legitimacy strategy seems to be the focus of *RWE*, our results also indicate tendencies towards the use of the third legitimacy strategy. This becomes obvious because *RWE* discloses a number of objectives regarding renewable energies, but none concerning nuclear power. Overall, we can identify the tendencies of *RWE* to use the second and third legitimacy strategy, whereas *Deutsche Telekom* and *Continental* show no use of strategy at all.

Discussion

Legitimacy strategies

The reporting pattern we analyze in our study evinces the way in which companies disclose objectives in their CER and allows for further conclusions regarding the legitimacy strategies applied. In the following, we discuss to what extent these strategies are used by the companies in our sample.

In the last years, several studies have shown that companies nowadays are aware of the importance of a transparent reporting (e.g. Scherer et al. 2013; Smith 2003; Waddock et al. 2002). Furthermore, a great number of companies worldwide (e.g. BP in conjunction with its oil disaster) were seriously affected by the discovery of "greenwashing" (Cherry and Sneirson 2011), means misleading stakeholders in relation to their ecological activities that they promised in their CER. A mismatch between the disclosed objectives and the actual internal adjustments that has not been transparently communicated leads to distempered stakeholders (Du et al. 2010). In contrast, following stakeholder theory, companies that are perceived to fulfill stakeholders' expectations benefit, for example, through access to capital at lower costs (Orlitzky 2008) or an advantage in attracting and retaining employees (Greening and Turban 2000). Thus, in line with legitimacy theory, we expected to identify in most cases Lindblom's first legitimacy strategy. However, our results suggest that companies seem to have different demands on their own reporting quality in terms of disclosed objectives. Only the companies in the group *Transparent*, and a few companies from the *Ambitious* group, are able to disclose and pursue relevant objectives that reach high transparency levels over time, and thus successfully apply the first legitimacy strategy.

Instead, we are able to demonstrate that within our sample, the companies apply the second legitimacy strategy lots of times and thus try that their activities are recognized as conform to their stakeholders' value system (legitimacy theory). The companies in the clusters *Ambitious* and *Underperformer* are main users of this strategy. For both groups, we identify companies that show a tendency to disclose ambitious objectives that are not really achievable, mainly because the objectives' achievement is highly dependent from external factors, such as the legal situation. In all these cases, we expect that high stakeholder pressure might be a main reason for trying to change the perception of the stakeholder in terms of the companies' own internal adjustments. An indication for the application of this strategy can be found when companies disclose several objectives that are reported consistently over time, but unexpectedly cancelled without notification. Considering that we identify the second legitimacy strategy frequently within our data, we assume that objectives are a common tool in CER to change stakeholders' perceptions in terms of the internal adjustments that are actually made.

However, it is important to note that the second legitimacy strategy is relatively complicated to identify. On the one hand, a failure in the transparent communication of objectives does not necessarily indicate an intent to mislead stakeholders. Often, we assume a negligent communication of objectives rather than the deployment of a conscious strategy. On the other hand, a company might communicate objectives transparently, but without making actual internal adjustments. However, we cannot prove in our analysis if a company lies to its stakeholders in such a way.

Occasionally, we can find hints of the third legitimacy strategy. This strategy highlights non-critical topics instead of subjects from areas of concern. Both electric utilities companies, *E.ON* and *RWE*, disclose above-average numbers of objectives, but not one objective related to nuclear energy, which is a topic of the highest public interest. Instead, both companies report intensively about their renewable energies (*E.ON*: four objectives; *RWE*: three objectives). Without any question, this is also a topic of great interest—but it is also a symbol for clean and future-oriented technology and therefore has a high legitimate status, which makes it a preferred topic for a company to talk about.

Apart from the different legitimacy strategies we reveal in our analysis, our results show an alarming tendency of some companies in the sample that seem not to follow any legitimacy strategy at all. We rather find a negligent communication of objectives, which is characterized by a number of objectives that are not only communicated non-transparent over time, but rather in such a confusing manner that we cannot assume an actual attempt to mislead stakeholder (e.g. *Continental*). If a company changes the extent of an objective in every report without notification, even a stakeholder who compares only two or three consecutive reports can identify a non-transparent communication. Taking the findings of stakeholder theory and legitimacy theory into account, this reporting behavior is unwise because it may have a direct impact on a company's legitimacy.

Overall, our findings indicate that the companies in our sample use all three legitimacy strategies that we derived from Lindblom (2010) within our theoretical framework. It is important to note that only few companies pursue a continuous strategy of disclosing objectives matching the actual internal adjustments (first legitimacy strategy). More often, the companies use the second legitimacy strategy. However, we want to emphasize that these companies at least have a strategic approach in regard to disclosing objectives in CER. For some companies, we are not able to recognize any strategy at all.

The results described raise the question why companies have a certain reporting behavior. External pressure can force companies to disclose more objectives (or objectives with higher extents or shorter time periods) than they wish to. Therefore, companies may be in the situation of having to disclose objectives while knowing well that the required internal adjustments cannot be achieved. If this is the case, a company has two options. First, the company can follow up on the objective until the end of the time period and then report openly that it failed to achieve this objective. Second, companies can either stop reporting information about the objective or change the extent or time period of the objective without further explanation. In our analysis we identify several cases that take the latter option, whereas the first option could be found only a very few times. Because the costs of a confession (in the literature also called proprietary costs, e.g. Prencipe 2004, Verrecchia 1983) in line with option one can be relatively high, we are not surprised to find this small number of examples. In contrast, the second option is applied far more often, since costs would only arise when the non-transparent reporting is revealed by stakeholders. Obviously, on most occasions stakeholders do not notice these non-transparent reporting, since we are able to show changes in extent and time period regularly for the companies in our sample. This strategy leads to minimum cost for the company, which companies aim at in environmental reporting (Cormier and Magnan 1999; Gamerschlag et al. 2011). Therefore, we wish to encourage stakeholders and researchers to check for consistency when trying to identify whether a company claims to be an ecologically sustainable company or not.

Managerial implications

We are able to derive three managerial implications. First, it is important for a manager to have a clear understanding of how to handle objectives in a company's CER. That means it is the best way to disclose only those objectives that can be realistically achieved. This allows companies to reach a relatively high level of transparency in reporting over time and thus helps to maintain legitimacy (following legitimacy strategy one). In contrast, it is very important to avoid a negligent communication of objectives. Even though a company might actually be able to make sufficient internal adjustments, this kind of communication gives stakeholders the impression that the company does not take its statements about future intentions serious (Du et al. 2010). Although objectives that are very ambitious may pretend—potentially over several years—a relatively high ecological engagement of a company, we do not recommend to disclose too ambitious objectives. This is due to the reason that a company will probably not achieve these objectives and therefore has to decide between two choices: (a) do not communicate the failure transparently or (b) communicate the failure transparently. While (a) is definitively misleading stakeholders, we also think that (b) is ethically not correct because the objective was disclosed knowing that an achievement is unlikely, and the stakeholders are misled over several reporting periods. In contrast, the failure will be announced in just one report, hoping that a great percentage of stakeholder will be unaware of it. Furthermore, in both cases the costs of (a) an exposure of the non-transparency and (b) an own confession of the failure (especially for a company's legitimacy) are extremely unpredictable. Overall, a high level of transparency in the disclosed objectives becomes even more important since we expect that companies' disclosed objectives in CER will be monitored more closely in the future. Thus, a company is well-advised to apply the first legitimacy strategy, and, in case of high stakeholders' expectations, communicate clearly why the circumstances do not allow to disclose objectives, e.g. because of unpredictable external factors.

Second, we recommend publishing overview tables for objectives to those managers who have to deal with the design and development of environmental reports. These tables contain all recent objectives, divided by thematic categories, and include extent and end time. Changes in objectives as well as new objectives should be indicated clearly and explained briefly. Measures adopted and status updates on progress are not necessary but add interesting information. These tables make it easy for stakeholders to gain an overview of objectives in reports. As we identified, clearly structured overview tables are a first indication of transparent reporting. *Merck*, which has used overview tables in its reports since 2005, is a positive example of a company taking this approach. Only one of *Merck*'s nine objectives is not reported transparently. Thus, we recommend companies to demonstrate their high level of transparency when disclosing objectives by providing tables that stakeholder can easily follow.

Third, we suggest managers consider the industry their company operates in when disclosing objectives. Our results show the number of objectives disclosed varies greatly between the companies in our four groups, which indicates that no standard exists that recommends how many objectives should be disclosed. Despite the rather small number of companies in our sample, our findings indicate that the number of disclosed objectives might be related to the industry in which a company operates. Research has already shown that different sectors influence the quality and extent of environmental reporting (Hahn and Kühnen 2013). Our results partially correspond to those findings, as the *Ambitious* group (characterized by a rather large number of disclosed objectives and a rather high level of transparency) contains only companies from sectors whose operations have environmental impacts, e.g. the automotive industry (*BMW*, *Daimler*, *Volkswagen*), the chemical industry (*BASF*, *Bayer*) or the operations of an electric utilities company (*E.ON*) (see Appendix 4). Companies from sectors that are less closely related to environmental impacts, such as the financial service sector (in the insurance field, such as *Munich Re* and *Linde*, or the banking field, such as *Commerzbank* and *Deutsche Bank*) disclose fewer objectives. However, exceptions can be found. *Lufthansa* (aviation industry; 8 objectives) and *K+S* (chemical industry; 10 objectives) do have a direct environmental impact but disclose a below-average number of objectives. Based on these results, we suggest companies from sectors with high environmental impact should disclose a higher number of objectives compared to those companies from low-impact industries. This is important to comply with stakeholders' expectations. For the actual number of objectives that are expected, the companies can take account of our study's results.

Limitations and future research

Some limitations must be mentioned: First, due to the longitudinal design of our analysis, we have to state that the transparency level of reporting objectives in the last period might, in general, be positively skewed compared to the first and second period. While the first period can be evaluated over a rather long time horizon, objectives first disclosed in the last period are usually not completed within our sample. Further studies are needed to follow up on our analyzed objectives and to compare the results with our results, in particular in time period three (2010-2014).

Second, we did not consider environmental reports on websites due to the ability for them to be changed over time. Although it seems likely that website reports will be given increasing attention in the future, and thus, potentially more stakeholders will read them, we believe that the backward modifiability of the data supports non-transparency. Nevertheless, when companies stop publishing reports in PDF format, future research will have to consider the use of online CER. Periodic screenshots of the reporting websites might be a feasible solution for the problems mentioned above.

Third, our study considered the largest stock-listed companies in Germany, which is a rather small sample. However, all of these companies have embedded sustainability management as part of their strategy and therefore frequently issued environmental reports. Therefore, future research should also try to analyze the reporting strategies of small- and medium-size companies, which may not have embedded sustainability management, and compare our findings with other international samples. Furthermore, in order to reach generalizable results in an under-researched field, we did not focus on a particular industry. Further studies on specific industries can provide valuable insights through the comparison of companies in different industries.

Fourth, it is important to state that our results are based on environmental reports only and thus do not give any information regarding the actual and concrete ecological activities of a company. Thus, if a company aims at lying to its stakeholders (instead of misleading them), we cannot prove this in our analysis. In fact, our evaluation of a company's transparency is an assessment of its reporting consistency over time as well as a relative indication in comparison to the other companies of the sample.

Lastly, our research design does not consider how companies address different stakeholders when disclosing objectives in their CER. Stakeholder theory suggests a long-term involvement of stakeholders to obtain a competitive advantage (e.g. Fernandez-Feijoo et al. 2014; Morsing and Schultz 2006). Future research in this field should consider this fact and answer the question as to what extent transparency in CER is necessary for the various stakeholder relationships.

Conclusion

This study addresses the increasingly discussed topic of transparency in CER. Based on institutional, legitimacy and stakeholder theory and the legitimacy strategies suggested by Lindblom (2010), our work contributes to existing research in two respects.

First, we use the established legitimacy strategies to apply them to a particular element of CER, namely the disclosed objectives, which helps to further understanding of strategies in CER. Second, we show that these legitimacy strategies can be identified through a comprehensive analysis of the objectives' reporting pattern in terms of transparency. This allows for an empirical validation of Lindblom's theoretical model of legitimacy strategies.

Based on our results, we assign each company to one of the groups *Transparent*, *Ambitious*, *Underperformer* and *Nontransparent*. While the *Transparent* group shows a strategy of actual internal adjustments that follow on disclosed objectives, we can see a tendency of certain companies within the groups *Ambitious* and *Underperformer* to use misleading strategies that are intended to change the stakeholders' perception regarding the companies' internal adjustments. In contrast, we cannot identify clear strategies of the companies in the group *Nontransparent*.

Appendices

Appendix 1: Sample

<table>
<tr><th>Company</th><th>GRI</th><th>2000</th><th>2001</th><th>2002</th><th>2003</th><th>2004</th><th>2005</th><th>2006</th><th>2007</th><th>2008</th><th>2009</th><th>2010</th><th>2011</th><th>2012</th><th>2013</th><th>2014</th></tr>
<tr><td>Adidas</td><td>✓</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td></td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td></tr>
<tr><td>Allianz</td><td>✓</td><td></td><td></td><td></td><td>←</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td></td><td>ER</td></tr>
<tr><td>BASF</td><td>✓</td><td>ER</td><td>ER</td><td>ER</td><td>IR</td><td>IR</td><td>IR</td><td>IR</td><td>IR</td><td>IR</td><td>IR</td><td>IR</td><td>IR</td><td>IR</td><td>IR</td><td>IR</td></tr>
<tr><td>Bayer</td><td>✓</td><td></td><td>←</td><td>←</td><td>←</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>IR</td><td>IR</td></tr>
<tr><td>Beiersdorf</td><td>✓</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>IR</td><td>ER</td><td>ER</td><td>ER</td></tr>
<tr><td>BMW</td><td>✓</td><td colspan="3">← ER</td><td colspan="2">ER</td><td colspan="2">ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td colspan="2">ER | ER | ER</td><td>ER</td><td>ER</td></tr>
<tr><td>Commerzbank</td><td>✓</td><td></td><td></td><td></td><td></td><td>←</td><td>ER</td><td>←</td><td>ER</td><td>←</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td></tr>
<tr><td>Continental</td><td>✓</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>IR</td><td>IR</td><td>IR</td><td>IR</td><td>ER</td><td>ER</td><td>ER</td><td>IR</td></tr>
<tr><td>Daimler</td><td>✓</td><td>ER</td><td>←</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td></tr>
<tr><td>Deutsche Bank</td><td>✓</td><td></td><td></td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td></tr>
<tr><td>Deutsche Post</td><td>✓</td><td></td><td>←</td><td>←</td><td>ER</td><td>←</td><td>←</td><td>ER</td><td>←</td><td colspan="2">ER | ER | ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td></tr>
<tr><td>Deutsche Telekom</td><td>✓</td><td></td><td></td><td></td><td>ER</td><td>ER</td><td>ER</td><td></td><td>←</td><td>ER</td><td>ER</td><td colspan="2">ER | ER | ER</td><td>ER</td><td>ER</td><td>ER</td></tr>
<tr><td>E.ON</td><td>✓</td><td></td><td></td><td></td><td></td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td></tr>
<tr><td>HeidelbergCement</td><td>✓</td><td></td><td></td><td></td><td colspan="3">← ER</td><td colspan="2">ER</td><td colspan="3">← ER | ER</td><td colspan="2">ER</td><td colspan="2">ER</td></tr>
<tr><td>Henkel</td><td>✓</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td></tr>
<tr><td>Infineon</td><td>✓</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>IR</td><td>IR</td><td>IR</td><td>IR</td></tr>
<tr><td>K+S</td><td>✓</td><td></td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td></tr>
<tr><td>Lanxess</td><td>✓</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>IR</td><td>IR</td><td>IR</td><td>IR</td><td>IR</td><td>IR</td><td>IR</td></tr>
<tr><td>Linde</td><td>✓</td><td></td><td></td><td></td><td></td><td>←</td><td>ER</td><td>←</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td></tr>
<tr><td>Lufthansa</td><td></td><td colspan="2">ER</td><td colspan="3">ER | ER | ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td></tr>
<tr><td>Merck</td><td>✓</td><td></td><td></td><td></td><td>ER</td><td>←</td><td>ER</td><td>←</td><td>ER</td><td>←</td><td>ER</td><td>←</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td></tr>
<tr><td>Munich Re</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td></tr>
<tr><td>RWE</td><td>✓</td><td>ER</td><td>ER</td><td>←</td><td>ER</td><td>←</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td></tr>
<tr><td>Siemens</td><td>✓</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td></td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td><td>IR</td><td>IR</td></tr>
<tr><td>Volkswagen</td><td>✓</td><td></td><td colspan="2">ER</td><td colspan="2">ER</td><td colspan="2">ER</td><td colspan="2">ER</td><td colspan="2">ER | ER</td><td>ER</td><td>ER</td><td>ER</td><td>ER</td></tr>
</table>

Note: ER = Environmental Report; IR = Integrated Report; The years refer to the publication date of the reports given by the companies. Where a report encompasses longer reporting periods than the year of the publication date, we marked the prior years by an arrow. For example, the *Allianz* environmental report of the year 2004 includes the reporting periods for 2003 and 2004.

Appendix 2: Category system

Basis: GRI aspect and indicator of environmental category		Resulting category		Exemplary CSR measure
Materials (EN1, EN2)	Primary and secondary resources used for the production of products and services	Materials		Higher usage of ecological resources
Energy (EN3-EN7)	Energy consumption within and outside of the organization, energy intensity, reduction of energy consumption	Energy		
			Energy consumption	Reduction of energy consumption
			Use of energy from renewable sources	Growth of green electricity usage
			Manufacturing of energy from non-renewable sources	Increase in efficiency of coal-fired power plants
			Manufacturing of energy from renewable sources	Increase of energy output of renewable energies
Water (EN8-EN10)	Withdrawal of water, volume of water recycled and reused	Water		Reduction of water consumption
Biodiversity (EN11-EN14)	Impact of products and services on the biodiversity, measures of protection and renaturation, endangered species	Biodiversity		Reduction of noise emission
Emissions (EN15-EN19)	Volume of direct and indirect greenhouse emissions, extent of other air emission, measure of reduction	Emissions		
			Greenhouse gas emissions	Reduction of carbon dioxide emissions
			Other significant air emissions	Reduction of dust emissions
Effluents and Waste (EN22-EN26)	Total volume of effluents discharged, total weight of waste, hazardous waste, extent of significant pollution	Effluents		Reduction of effluents produced
		Waste		Reduction of waste
Products and Services (EN27, EN 28)	Measures for the reduction of ecological effects of products and services	Responsibility for products and services		
			Analysis and development	Development of products and services with awareness of ecological effects
			Creation	Optimization of conventional products and services
			Usage	Reduction of energy consumption of a product
			Exploitation	Increase in products' exploitation rate
Compliance (EN29)	Monetary and non-monetary penalties for noncompliance with environmental laws and provisions	Compliance		Prevention of violations of environmental laws
Transport (EN 30)	Ecological consequences of transportation of products and employees	Transport		Optimization of the truck capacity utilization

Overall (EN31)	Total expenses and investments for environment protection	-	-
Supplier Environmental Assessment (EN32, EN33)	Screening of suppliers using environmental criteria, significant actual and potential negative environmental impacts in the supply chain and actions taken	Supplier management	
		Plan	Integration of ecological standards in contracts
		Control	Enhancement of ecological supplier audits
Environmental Grievance Mechanisms (EN34)	Number of complaints in relation to ecological complaints	Complaints procedure	Prevention of future ecological complaints
Inductive complemented categories		Strategic foundation	Expansion of training for conscious ecological behavior
		Monitoring of ecological aspects	Introduction of an environmental management system

Appendix 3: Distance Table

Proximity Matrix

	Squared Euclidean Distances																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1:Adidas	0.000																								
2:BASF	.119	0.000																							
3:Bayer	2.135	1.381	0.000																						
4:BMW	.502	.161	1.297	0.000																					
5:Daimler	.969	.420	.900	.096	0.000																				
6:Siemens	.411	.492	3.337	.533	1.053	0.000																			
7:Volkswagen	.221	.168	2.305	.199	.569	.095	0.000																		
8:E.ON	2.149	1.572	3.275	.795	.794	1.091	1.019	0.000																	
9:HeidelbergCement	2.050	1.243	1.504	.524	.244	1.680	1.206	.433	0.000																
10:Lanxess	1.420	2.135	6.940	2.683	3.784	.880	1.420	3.576	4.984	0.000															
11:Merck	1.078	1.727	6.178	2.272	3.298	.684	1.127	3.299	4.505	.024	0.000														
12:Allianz	2.187	3.245	8.611	4.230	5.599	2.014	2.629	5.865	7.328	.306	.367	0.000													
13:Infineon	4.852	6.336	13.408	7.534	9.330	4.253	5.294	8.956	11.272	1.266	1.539	.533	0.000												
14:Linde	3.125	4.353	10.402	5.424	6.963	2.782	3.567	6.973	8.778	.562	.708	.085	.192	0.000											
15:Munich Re	4.234	5.632	12.363	6.788	8.498	3.720	4.676	8.252	10.398	.989	1.219	.341	.021	.085	0.000										
16:Henkel	1.565	1.869	6.162	1.840	2.634	.445	.947	1.660	3.127	.519	.526	1.614	3.000	2.041	2.638	0.000									
17:K+S	2.379	2.545	6.934	2.235	2.950	.829	1.406	1.392	3.089	1.155	1.202	2.605	3.990	3.031	3.628	.141	0.000								
18:Lufthansa	4.072	4.272	9.440	3.765	4.573	1.922	2.746	2.176	4.442	1.990	2.161	3.622	4.582	3.878	4.304	.651	.227	0.000							
19:Beiersdorf	2.432	3.011	8.313	3.150	4.211	1.117	1.863	2.936	4.883	.387	.517	1.176	1.922	1.347	1.688	.195	.377	.671	0.000						
20:Commerzbank	6.667	6.984	13.273	6.325	7.311	3.832	4.987	3.945	6.952	3.384	3.723	5.114	5.434	5.114	5.285	1.806	1.099	.333	1.483	0.000					
21:Deutsche Bank	6.886	7.597	14.812	7.347	8.667	4.225	5.560	5.501	8.791	2.757	3.184	3.878	3.558	3.622	3.537	1.930	1.506	.767	1.183	.333	0.000				
22:Deutsche Post	4.191	4.784	10.878	4.686	5.829	2.215	3.218	3.631	6.180	1.262	1.522	2.285	2.605	2.285	2.455	.674	.533	.333	.270	.566	.333	0.000			
23:Continental	13.202	12.543	17.512	10.545	10.792	9.075	10.107	5.731	8.799	10.917	11.200	14.489	15.874	14.915	15.512	6.932	5.093	3.622	7.410	2.797	4.901	5.626	0.000		
24:Deutsche Telekom	7.258	6.661	10.384	5.184	5.356	4.378	4.980	2.025	4.054	6.405	6.469	9.416	11.441	10.098	10.951	3.307	2.121	1.558	4.075	1.770	3.605	3.293	.945	0.000	
25:RWE	6.096	5.488	8.817	4.123	4.253	3.537	4.011	1.371	3.104	5.680	5.680	8.583	10.821	9.350	10.288	2.769	1.739	1.417	3.643	1.912	3.720	3.124	1.496	.064	0.000

Appendix 4: Results

Company	Main sector	Number of objectives disclosed	Level of transparency	Cluster	Cluster name	Stakeholder expectations with regard to environmental disclosing
Adidas	Clothing industry	16	94%	2	Ambitious	low
Allianz	Insurance industry	6	100%	1	Transparent	low
BASF	Chemical industry	18	89%	2	Ambitious	high
Bayer	Chemical and pharmaceutical industry	26	92%	2	Ambitious	high
Beiersdorf	Consumer goods industry	7	71%	3	Underperformer	low
BMW	Automotive manufacturer	19	79%	2	Ambitious	middle
Commerzbank	Banking sector	5	40%	3	Underperformer	low
Continental	Automotive supplier	10	0%	4	Nontransparent	middle
Daimler	Automotive manufacturer	21	76%	2	Ambitious	middle
Deutsche Bank	Banking sector	2	50%	3	Underperformer	low
Deutsche Post	Logistics sector	5	60%	3	Underperformer	middle
Deutsche Telekom	Telecommunication provider	13	23%	4	Nontransparent	low
E.ON	Electric utility service provider	18	56%	2	Ambitious	high
HeidelbergCement	Construction materials industry	22	64%	2	Ambitious	high
Henkel	Consumer goods industry	10	70%	3	Underperformer	low
Infineon	Semiconductor industry	1	100%	1	Transparent	low
K+S	Mining industry	10	60%	3	Underperformer	high
Lanxess	Chemical industry	8	88%	1	Transparent	high
Linde	Industrial gases and plant engineering	4	100%	1	Transparent	middle
Lufthansa	Aviation industry	8	50%	3	Underperformer	middle
Merck	Chemical and pharmaceutical industry	9	89%	1	Transparent	high
Munich Re	Insurance industry	2	100%	1	Transparent	low
RWE	Electric utility service provider	14	29%	4	Nontransparent	high
Siemens	Electrotechnical industry	14	79%	2	Ambitious	middle
Volkswagen	Automotive manufacturer	16	81%	2	Ambitious	middle

Compliance with ethical standards

Funding: This study did not receive any funding.

Ethical approval: This article does not contain any studies with human participants or animals performed by any of the authors.

References

Adams, C., Hill, W.-Y., & Roberts, C. B. (1998). Corporate social reporting practices in Western Europe: Legitimating corporate behaviour? *The British Accounting Review*, 30(1), 1–21.

Aerts, W., & Cormier, D. (2009). Media legitimacy and corporate environmental communication. *Accounting, Organizations and Society*, 34(1), 1–27.

Al-Tuwaijri, S., Christensen, T. E., & Hughes, K. E. (2004). The relations among environmental disclosure, environmental performance, and economic performance: a simultaneous equations approach. *Accounting, Organizations and Society*, 29(5), 447-471.

Aldenderfer, M. S., & Blashfield, R. K. (1984). Cluster Analysis. Sage University Paper series on Quantitative Applications in the Social Sciences 07-044. Sage Publications, Newberry Park, CA.

Archel, P., Fernández, M., & Larrinaga-González, C. (2008). The organizational and operational boundaries of triple bottom line reporting: a survey. *Environmental Management*, 41, 106-117.

Ashforth, B. E., & Gibbs, B. W. (1990). The double-edge of organizational legitimation. *Organization Science*, 1(2), 177-194.

Bansal, P., & Roth, K. (2000). Why companies go green: A model of ecological responsiveness. *Academy of Management Journal*, 43(4), 717-736.

Beresford, D. R., & Feldman, S. A. (1976). Companies increase social responsibility disclosure. *Management Accounting*, 59(9), 51-55.

Bowman, E. H., & Haire, M. (1976). Social impact disclosure and corporate annual reports. *Accounting, Organizations and Society*, 1(1), 11-21.

Brown, J., & Fraser, M. (2006). Approaches and perspectives in social and environmental accounting: an overview of the conceptual landscape. *Business Strategy and the Environment*, 15(2), 103-117.

Cherry, M. A., & Sneirson, J. F. (2011). Beyond Profit: Rethinking Corporate Social Responsibility and Greenwashing After the BP Oil Disaster. *Tulane Law Review*, 85(4), 983-xxx.

Cho, C. H. (2009). Legitimation strategies used in response to environmental disaster: A French case study of Total SA's Erika and AZF incidents. *European Accounting Review*, 18(1), 33-62.

Cormier, D., & Magnan, M. (1999). Corporate environmental disclosure strategies: determinants, costs and benefits. *Journal of Accounting, Auditing & Finance*, 14(4), 429–451.

Cormier, D., & Magnan, M. (2003). Environmental reporting management: a European perspective. *Journal of Accounting and Public Policy*, 22(1), 43-62.

Criado-Jiménez, I., Fernández-Chulián, M., Husillos-Carqués, F. J., & Larrinage-González, C. (2008). Compliance with mandatory environmental reporting in financial statements: the case of Spain (2001-2003). *Journal of Business Ethics*, 79(3), 245-262.

Deegan, C., & Unerman, J. (2011). *Financial accounting theory: European edition.* McGraw-Hill Education, New York, NY.

Delmas, M. A., & Burbano, V. C. (2011). The drivers of greenwashing. *California Management Review*, 54(1), 64-87.

DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, 48(2), 147–160.

Dolnicar, S. (2003). Using Cluster Analysis for market segmentation: Typical misconceptions, established methodological weaknesses and some recommendations for improvement. *Australasian Journal of Market Research*, 11(2), 5–12.

Donaldson, T., & Preston, L. E. (1995). The stakeholder theory of the corporation: Concepts, evidence, and implications. *Academy of Management Review*, 20(1), 65-91.

Dowling, J., & Pfeffer, J. (1975). Organizational legitimacy: Social values and organizational behavior. *Pacific Sociological Review*, 122-136.

Du, S., Bhattacharya, C. B., & Sen, S. (2010). Maximizing business returns to corporate social responsibility (CSR): The role of CSR communication. *International Journal of Management Reviews*, 12(1), 8-19.

Du, S., Bhattacharya, C. B., & Sen, S. (2015). Corporate social responsibility, multi-faceted job-products, and employee outcomes. *Journal of Business Ethics*, 131(2), 319-335.

Esrock, S. L., & Leichty, G. B. (1998). Social responsibility and corporate web pages: Self-presentation or agenda-setting? *Public Relations Review*, 24(3), 305-319.

Fernandez-Feijoo, B., Romero, S., & Ruiz, S. (2014). Effect of stakeholders' pressure on transparency of sustainability reports within the GRI framework. *Journal of Business Ethics*, 122(1), 53-63.

Fifka, M. S. (2013). Corporate responsibility reporting and its determinants in comparative perspective–a review of the empirical literature and a meta-analysis. *Business Strategy and the Environment*, 22(1), 1-35.

Freeman, R. E. (2010). *Strategic Management: A Stakeholder Approach*. Cambridge University Press, Cambridge.

Fukukawa, K., Balmer, J. M. T., & Gray, E. R. (2007). Mapping the interface between corporate identity, ethics and corporate responsibility. *Journal of Business Ethics*, 76(1), 1–5.

Gamerschlag, R., Möller, K., & Verbeeten, F. (2011). Determinants of voluntary CSR disclosure: empirical evidence from Germany. *Review of Managerial Science*, 5(2-3), 233–262.

Global Reporting Initiative (2015). G4 Sustainability Reporting Guidelines. *Global Reporting Initiative*, August 2015. https://www.globalreporting.org/resourcelibrary/GRIG4-Part1-Reporting-Principles-and-Standard-Disclosures.pdf. Accessed 26 July 2016.

Gray, R. (2010). Is accounting for sustainability actually accounting for sustainability… and how would we know? An exploration of narratives of organisations and the planet. *Accounting, Organizations and Society*, 35(1), 47-62.

Gray, R., Kouhy, R., & Lavers, S. (1995). Corporate social and environmental reporting: a review of the literature and a longitudinal study of UK disclosure. *Accounting, Auditing & Accountability Journal*, 8(2), 47-77.

Gray, R., Owen, D., & Adams, C. (1996). *Accounting & accountability: changes and challenges in corporate social and environmental reporting*. Prentice Hall, Upper Saddle River.

Greening, D. W., & Turban, D. B. (2000). Corporate social performance as a competitive advantage in attracting a quality workforce. *Business & Society*, 39(3), 254-280.

Guthrie, J., & Parker, L. D. (1989). Corporate social reporting: A rebuttal of legitimacy theory. *Accounting and Business Research*, 19(76), 343–352.

Hahn, R., & Kühnen, M. (2013). Determinants of sustainability reporting: a review of results, trends, theory, and opportunities in an expanding field of research. *Journal of Cleaner Production*, 59, 5–21.

Hahn, R., & Lülfs, R. (2014). Legitimizing negative aspects in GRI-oriented sustainability reporting: A qualitative analysis of corporate disclosure strategies. *Journal of Business Ethics*, 123(3), 401-420.

Hair, J. F. J., Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). *Multivariate data analysis* (5th ed.). Prentice Hall, Upper Saddle River, New Jersey.

Holder-Webb, L., Cohen, J.R., Nath, L., & Wood, D. (2009). The supply of corporate social responsibility disclosures among U.S. firms. *Journal of Business Ethics,* 84(4), 497-527.

Hopwood, A. G. (2009). Accounting and the environment. *Accounting, Organizations and Society*, 34(3), 433-439.

Kilian, T., & Hennigs, N. (2014). Corporate social responsibility and environmental reporting in controversial industries. *European Business Review*, 26(1), 79-101.

Kolk, A. (2004). A decade of sustainability reporting: developments and significance. *International Journal of Environment and Sustainable Development*, 3(1), 51-64.

Krippendorff, K. (2004). *Content analysis - An introduction to its methodology* (3nd ed.). Sage Publications, Thousand Oaks.

Laine, M. (2010). Towards sustaining the status quo: Business talk of sustainability in Finnish corporate disclosures 1987–2005. *European Accounting Review*, 19(2), 247-274.

Larrinaga-González, C. (2007). Sustainability reporting. Insights from neoinstitutional theory. In J. Unerman, J. Bebbington, & B. O'Dywer (eds.), *Sustainability Accounting and Accountability*, (pp. 150-167). Routledge, London.

Lindblom, C. K. (2010). The implications of organizational legitimacy for corporate social performance and disclosure. In R. Gray, J. Bebbington, & S. Gray (eds.), *Social and environmental accounting: Developing the field*, (pp. 51–63). Sage, Los Angeles.

Marquis, C., Toffel, M. W., & Zhou, Y. (2016). Scrutiny, norms, and selective disclosure: A global study of greenwashing. *Organization Science*, 27(2), 483-504.

Mayring, P. (2015). *Qualitative Inhaltsanalyse: Grundlagen und Techniken* (12th ed.). Beltz Deutscher Studien Verlag, Weinheim, Basel.

Meyer, J. W., & Rowan, B. (1977). Institutionalized organizations: Formal structure as myth and ceremony. *American Journal of Sociology*, 83(2), 340-363.

Milne, M. J., & Gray, R. (2013). W(h)ither ecology? The triple bottom line, the Global Reporting Initiative, and corporate sustainability reporting. *Journal of Business Ethics*, 118(1), 13–29.

Moll, J., Burns, J., & Major, M. (2006). Institutional theory. In Z. Hoque (ed.), *Methodological Issues in Accounting Research: Theories, Methods and Issues*, (pp. 183-205). Spiramus, London.

Morsing, M., & Schultz, M. (2006). Corporate social responsibility communication: stakeholder information, response and involvement strategies. *Business Ethics: A European Review*, 15(4), 323–338.

Nienaber, A.-M., Borgstedt, P., Liesenkötter, B., & Schewe, G. (2015). Kommunikation von ökologisch nachhaltiger Unternehmensführung im Energieversorgungssektor – Eine qualitativ-longitudinale Analyse zur Transparenz in der Nachhaltigkeitsberichterstattung. *Zeitschrift für Umweltpolitik und Umweltrecht*, 28(1), 52–97.

Oliveira, L., Rodrigues, L. L., & Craig, R. (2013). Stakeholder theory and the voluntary disclosure of intellectual capital information. *Caspian Journal of Applied Sciences Research*, 2(3), 75-93.

Oliver, C. (1991). Strategic responses to institutional processes. *Academy of Management Review*, 16(1), 145-179.

Orlitzky, M. (2008). Corporate social performance and financial performance: a research synthesis. In: A. Crane, A. McWilliams, D. Matten, J. Moon, & D. Siegel (eds.), *The Oxford handbook of corporate social responsibility*, (pp. 112–134). Oxford University Press, New York.

O'Donovan, G. (2002). Environmental disclosures in the annual report: Extending the applicability and predictive power of legitimacy theory. *Accounting, Auditing & Accountability Journal*, 15(3), 344-371.

O'Dwyer, B. (2002). Managerial perceptions of corporate social disclosure: An Irish story. *Accounting, Auditing & Accountability Journal*, 15(3), 406-436.

Parsons, T. (1956a). Suggestions for a sociological approach to the Theory of Organizations. I. *Administrative Science Quarterly*, 1(1), 63-85.

Parsons, T. (1956b). Suggestions for a sociological approach to the Theory of Organizations. II. *Administrative Science Quarterly*, 1(2), 225-239.

Post, J. E., Preston, L. E., & Sachs, S. (2002). Managing the extended enterprise: The new stakeholder view. *California Management Review*, 45(1), 6-28.

Prencipe, A. (2004). Proprietary costs and determinants of voluntary segment disclosure: evidence from Italian listed companies. *European Accounting Review*, 13(2), 319-340.

Reimsbach, D., & Hahn, R. (2015). The effects of negative incidents in sustainability reporting on investors' judgments – an experimental study of third-party versus self-disclosure in the realm of sustainable development. *Business Strategy and the Environment*, 24(4), 217-235.

Reverte, C. (2009). Determinants of corporate social responsibility disclosure ratings by Spanish listed firms. *Journal of Business Ethics*, 88(2), 351-366.

Roberts, R. W. (1992). Determinants of corporate social responsibility disclosure: An application of stakeholder theory. *Accounting, Organizations and Society*, 17(6), 595-612.

RWE AG (2016). *Unsere Verantwortung. Bericht 2015*. Essen. http://www.rwe.com/web/cms/mediablob/de/2996352/data/179662/9/rwe/verantwortung/Konzern-CR-Bericht-2015.pdf. Accessed 07 March 2017.

Scherer, A. G., Palazzo, G., & Seidl, D. (2013). Managing legitimacy in complex and heterogeneous environments: Sustainable development in a globalized world. *Journal of Management Studies*, 50(2), 259-284.

Schewe, G., Nienaber, A.-M., Buschmann, A., & Liesenkötter, B. (2012). Alles nur Greenwashing? Wie glaubwürdig berichten Unternehmen über ihr Nachhaltigkeits-engagement? *Zeitschrift für Umweltpolitik und Umweltrecht*, 35(1), 1–27.

Smith, N. C. (2003). Corporate social responsibility: whether or how? *California Management Review*, 45(4), 52-76.

Strauss, A., & Corbin, J. (1990). *Basics of qualitative research* (15th ed.). Sage, Newbury Park, CA.

Stray, S. (2008). Environmental Reporting: The U.K. Water and Energy Industries: A Research Note. *Journal of Business Ethics*, 80(4), 697-710.

Suchman, M. C. (1995). Managing legitimacy: Strategic and institutional approaches. *Academy of Management Review*, 20(3), 571-610.

Sweeney, L., & Coughlan, J. (2008). Do different industries report corporate social responsibility differently? An investigation through the lens of stakeholder theory. *Journal of Marketing Communications*, 14(2), 113-124.

Thompson, G. G. (2007). Terrestrial vertebrate fauna surveys for the preparation of environmental impact assessments; how can we do it better? A Western Australian example. *Environmental Impact Assessment Review*, 27(1), 41-61.

Thorne, L., Mahoney, L. S., & Manetti, G. (2014). Motivations for issuing standalone CSR reports: A survey of Canadian firms. *Accounting, Auditing & Accountability Journal*, 27(4), 686–714.

Tilling, M. V., & Tilt, C. A. (2010). The edge of legitimacy: Voluntary social and environmental reporting in Rothmans' 1956-1999 annual reports. *Accounting, Auditing & Accountability Journal*, 23(1), 55-81.

United Nations (1997). *Kyoto Protocol to the United Nations Framework Convention on Climate Change*. Conference of the Parties on Its Third Session, FCCC/CP/1997/L.7/Add.1, 10 December. http://unfccc.int/resource/docs/convkp/kpeng.pdf. Accessed 15 March 2017.

Van der Laan, S. (2009). The role of theory in explaining motivation for corporate social disclosures: Voluntary disclosures vs 'solicited' disclosures. *Australasian Accounting Business & Finance Journal*, 3(4), 15-29.

Verrecchia, R. E. (1983). Discretionary disclosure. *Journal of Accounting and Economics*, 5, 179–194.

Waddock, S. A., Bodwell, C., & Graves, S. B. (2002). Responsibility: The new business imperative. *The Academy of Management Executive*, 16(2), 132-148.

Ward Jr, J. H. (1963). Hierarchical grouping to optimize an objective function. *Journal of the American Statistical Association*, 58(301), 236-244.

Weber, R. P. (1990). *Basic content analysis*. Sage Publications, London.

Wiseman, J. (1982). An evaluation of environmental disclosures made in corporate annual reports. *Accounting, Organizations and Society*, 7(1), 53–63.