Successful corporate sustainability management in energy companies and beyond: A systems perspective

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Preface

My motivation to write this dissertation had already evolved during my master studies and continuously strengthened during my work as a consultant at Siemens Management Consulting. There I could gain practical insights into our transforming energy world, being mainly driven by sustainability including but not limited to decentralizing energy generation using increasingly renewable energy sources. Seeing the complexity for large companies to adjust in line with this transformation invoked my curiosity and strong wish to contribute with theoretically sound and practically applicable solutions for companies to cope with this complexity.

Despite my strong motivation to write this dissertation, I probably would not have been able to complete it without having received important support from a number of people. I am very grateful to everyone helping me during the time of my dissertation. Here, I want to formulate my special thanks to selected people.

First of all, I would like to thank Prof. Dr. Dodo zu Knyphausen-Aufseß for supervising my work as external doctoral candidate at the Department of Strategic Leadership and Global Management of the Technical University of Berlin. While trusting in me to refine my own ideas, he challenged me and offered guidance when needed to improve my work.

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Very special thanks belong to my beloved partner Dragan, my parents Birgit and Frank and my sister Caroline. They always believed in me and unconditionally motivated me during the good and not-so-good times of this endeavor. I have always appreciated and will continue to appreciate your love and great support.

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Last but not least, I am grateful to friends and colleagues at Siemens Management Consulting for granting me the chance and support in pursuing my scientific interest.

Stefanie Priemer

Abstract

This dissertation aims at enhancing our understanding of how companies may successfully manage their engagement in sustainability. In research, successfully managed corporate sustainability (CS) is widely argued to lead to implemented CS in a company and increased CS-related performance. However, practitioners lack guidance on what to address along the environmental, social, and economic CS dimensions. At the same time, they face a great variety of components for managing CS engagement without sufficient clarity on which components matter how for successful CS engagement.

Overall, CS is shown to be a complex construct. In order to capture and handle the complexity of CS, I take a systems perspective by applying general systems theory. In particular, I transfer insights from human resource systems as an established, comparable concept in human resource management research. By utilizing these insights and reflecting them with findings in my qualitative study among CS-leading companies, I develop the CS system framework.

The CS system framework fulfills all requirements of a long-demanded advanced framework for managing CS. The CS system framework underlines that the whole set of CS engagement elements matters – rather than single elements. In particular, the CS system framework clarifies areas to address which are based on research and instruments used in practice. Moreover, the CS system framework structures CS management components like a code of conduct, strategy, CS-related roles, CS progress tracking according to their purpose. This clarifies which CS management components are relevant for which objective and at which level in a company. Moreover, the CS system captures different types of fit to cover the holism of CS engagement. Fit is frequently implied in CS

research, but it has been insufficiently captured in existing frameworks and empirical studies.

As second cornerstone of my dissertation, I pay special attention to energy companies. CS engagement and its outcomes have been found to be industry-specific. I focus on energy companies, because they impose high sustainability-related risks as well as opportunities. Additionally, they look back upon profound, even pioneering engagement in CS. Thus, energy companies form an interesting research setting for CS management and its outcomes.

My systematic research review of CS engagement of energy companies reveals typical yet unstructured CS areas and CS management components, as well as overall positive performance impacts from CS management and its influences. The review also underpins the need for both, an advanced CS management framework in research and resulting enhanced guidance to practitioners on successful CS management.

My qualitative study using multiple case studies in eight European companies connected to the energy sector sets the basis for the CS system as advanced CS management framework. The study yields first empirical evidence on the relevance of fit. Moreover, it explains how CS areas, CSM components and their fit contribute to reaching implemented CS.

Turning towards CS-related performance, my quantitative study examines determinants of superior corporate environmental performance using a dataset from 147 European companies in different sectors and assessing the hypothesized associations with the help of partially-least squares structural equation modeling (PLS-SEM). I focus on environmental CS areas for high quality of data inputs, its relevance for energy

companies and a traditionally applied systems perspective in research on environmental management. Results show that a holistic rather than selective CS management approach is connected with higher CS-related performance and that this association is positively moderated by better fit.

All in all, the dissertation's findings are useful to derive recommendations for future research and for practice. In particular, the CS system framework and my studies' results allow proposing measures for enhancing CS management of energy companies.

Zusammenfassung

Das Ziel dieser Dissertation ist es, zu einem verbesserten Verständnis beizutragen, was erfolgreiches Nachhaltigkeitsmanagement von Unternehmen charakterisiert. Forscher argumentieren, dass erfolgreiches Nachhaltigkeitsmanagement zu implementierter Nachhaltigkeit in einem Unternehmen und höherer (Nachhaltigkeits-)Performance führt. Jedoch fehlt es an praktischen Anleitungen, was genau in den ökologischen, sozialen, ökonomischen Nachhaltigkeitsdimensionen zu adressieren ist. Gleichzeitig existiert eine Vielzahl an Nachhaltigkeitsmanagementkomponenten und es bleibt offen, welche Komponenten wofür und in welcher Weise für erfolgreiches Nachhaltigkeitsengagement relevant sind.

Insgesamt ist Nachhaltigkeit von Unternehmen ein komplexes Konstrukt. Um diese Komplexität allumfassend zu berücksichtigen, nutze ich die Systemperspektive auf Basis der generellen Systemtheorie. Insbesondere übertrage ich Erkenntnisse zu sogenannten Human Resource Systemen aus der Personalmanagementforschung. Dank der Anwendung dieser Erkenntnisse und deren Reflektion mit Ergebnissen meiner qualitativen Studie in führenden Unternehmen im Hinblick auf Nachhaltigkeit kann ich das Unternehmensnachhaltigkeitssystem als Framework entwickeln.

Das Unternehmensnachhaltigkeitssystem erfüllt alle Anforderungen an ein lange gefordertes, fortschrittliches Framework für Nachhaltigkeitsmanagement. Das Unternehmensnachhaltigkeitssystem unterstreicht, dass die Gesamtheit – nicht Selektion – von Elementen für Nachhaltigkeitsengagement wichtig ist. Das Unternehmensnachhaltigkeitssystem zeigt klare Themenfelder aus Forschung und Praxis, die adressiert werden sollten. Des Weiteren strukturiert es die Nachhaltigkeitsmanagementkomponenten, wie einen Verhaltenskodex, eine Strategie,

nachhaltigkeitsbezogene Rollen oder Fortschrittskontrollen, nach ihrem Zweck. Das sorgt für Klarheit, welche Nachhaltigkeitsmanagementkomponenten für welchen Zweck und auf welcher Ebene in einem Unternehmen relevant sind. Zusätzlich bildet das Unternehmensnachhaltigkeitssystem verschiedene Arten des Zusammenspiels von Elementen (Fit) ab. Somit wird die Gesamtheit der Unternehmensnachhaltigkeit berücksichtigt. Das Zusammenspiel (Fit) wird oft impliziert in der Nachhaltigkeitsforschung. Aber es wurde bisher unzureichend in existierenden Frameworks oder auch empirischen Studien berücksichtigt.

Den zweiten Eckpfeiler meiner Dissertation bildet der Fokus auf Energieunternehmen. Forschungsergebnisse zeigen, dass das Engagement in Nachhaltigkeit und dessen Resultat industriespezifisch sind. Ich fokussiere mich auf Energieunternehmen, weil sie sowohl große Risiken als auch Chancen in Bezug auf Nachhaltigkeit gegenüberstehen. Zusätzlich können Energieunternehmen auf ein fundiertes, teilweise sogar wegweisendes Engagement in Nachhaltigkeit zurückblicken. Deshalb sind Energieunternehmen ein interessantes Forschungsfeld für Nachhaltigkeitsmanagement und seine Resultate.

Mein systematischer Forschungsüberblick über Nachhaltigkeitsengagement von Energieunternehmen bringt typische aber unstrukturierte Themenfelder und Managementkomponenten für Unternehmensnachhaltigkeit hervor. Auch zeigt er einen insgesamt positiven Effekt von Nachhaltigkeitsmanagement auf Unternehmensperformance. Der Forschungsüberblick unterstreicht auch die Notwendigkeit eines fortschrittlichen Frameworks für Nachhaltigkeitsmanagement in der Forschung und resultierende verbesserte Handlungsempfehlungen für erfolgreiches Nachhaltigkeitsmanagement in der Praxis.

Meine qualitative Studie mit multiplen Fallstudien in acht europäischen Unternehmen, die im Energiesektor aktiv sind, formt die Basis für das Unternehmensnachhaltigkeitssystem als fortschrittliches Framework für Nachhaltigkeitsmanagement. Des Weiteren liefert die Studie erste empirische Ergebnisse zur Relevanz des Zusammenspiels (Fit) und erläutert, wie Themenfelder für Unternehmensnachhaltigkeit, entsprechende Managementkomponenten und deren Zusammenspiel (Fit) zum Erreichen einer implementierten Unternehmensnachhaltigkeit beitragen.

Als weiteres Resultat von Unternehmensnachhaltigkeit betrachte ich nachhaltigkeitsbezogene Performance in meiner quantitativen Studie. Diese Studie untersucht Bestimmungsfaktoren von überdurchschnittlicher ökologischer Performance an einem Datensatz von 147 europäischen Unternehmen aus unterschiedlichen Sektoren. Ich nutze ein varianzbasiertes Strukturgleichungsmodell (PLS-SEM) für die Untersuchung der hergeleiteten Zusammenhänge. Ich fokussiere mich auf ökologische Themenfelder der Nachhaltigkeit, um i) eine höhere Datenqualität zu erreichen, ii) einen relevanten Bereich für Energieunternehmen zu behandeln, und iii) die ursprünglich genutzte Systemperspektive in der Umweltforschung aufzugreifen. Die Ergebnisse zeigen, dass ein holistischer statt selektiver Ansatz des Nachhaltigkeitsmanagements mit einer höheren nachhaltigkeitsbezogene Performance in Verbindung steht. Diese Verbindung wird positiv moderiert durch ein gutes Zusammenspiel (Fit).

Insgesamt, leisten die Erkenntnisse in dieser Dissertation einen Beitrag für Empfehlungen an die Praxis und an zukünftige Forschungsfelder. Das Unternehmensnachhaltigkeitssystem und meine weiteren Forschungsergebnisse

ermöglichen es, spezifische Maßnahmen für verbessertes Nachhaltigkeitsmanagement von Energieunternehmen darzulegen.

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BMWi	German Federal Ministry for Economic Affairs and Energy (Bundesministerium für Wirtschaft und Energie)
CEM	Corporate environmental management
CEP	Corporate environmental performance
CP	Corporate performance
CS	Corporate sustainability
CSM	Corporate sustainability management
CSO	Chief Sustainability Officer
CSP	Corporate sustainability performance
DJSI	Dow Jones Sustainability Index
DSO	Distribution system operator
e.g.	For example
ES	Environmental system
EU	European Union
esp.	Especially
GRI	Global Reporting Initiative
HR	Human resource
HRM	Human resource management
ibid.	Ibidem (in the same place)
incl.	Including
ISO	International Organization for Standardization
KLD	Kinder, Lydenberg, and Domini
KPI	Key performance indicator
NGO	Non-governmental organization
O&G	Oil and gas
PLS-SEM	Partially-least squares structural equation modeling
RBV	Resource-based view
TSO	Transmission system operator
UN	United Nations
USA	United States of America
VIF	Variance inflation factor
VRIN	Valuable, rare, inimitable and non-substitutable
vs.	Versus

1 Introduction

"To allow the market mechanism to be sole director of the fate of human beings and their natural environment (...) would result in the demolition of society."

Karl Polanyi, economic anthropologist and sociologist (1944, p. 76)

"Global trends will ultimately reward companies that successfully balance their natural, social, and financial capitals, (...) companies that fail to adapt to these global trends risk becoming irrelevant."

Thomas Singer, researcher at The Conference Board (2016, p. 6)

"Ending poverty and ensuring sustainability are the defining challenges of our time. Energy is central to both of them."

Jim Yong Kim, president of The World Bank (2012)

These citations illustrate the high relevance of a more sustainable business conduct. Since the 1950s, such business conduct has gained rising substance in research and practice (Bansal and Song 2017; Aguinis and Glavas 2012). By now, it is an own research field having reached sufficient maturity to be considered a mainstream topic in highly-ranked management journals (Robertson 2008; Kang and Lee 2016). Moreover, it is common practice of companies to engage in shaping their business conduct to become more sustainable (Bonini and Bové 2014; Singer 2016).

I will refer to a more sustainable business conduct as corporate sustainability (CS). The blurred definition of CS and similar constructs like corporate social responsibility (CSR) has hindered research progress for quite some time (Carroll 2015). Thanks to several reviews of construct definitions, we now know that these constructs are converging

given their common focus on the relation between business, society, and the environment (e.g., Dahlsrud 2008; Montiel 2008; Bansal and Song 2017).

Although the convergence of CS and CSR helps advancing both research streams with their complementary insights, it is important to have clarity on their origins. This way, scholars can explore each stream further (Bansal and Song 2017). The CS research stream originally took a systems perspective to stress that companies are part of a larger system with several complex interdependencies (ibid.). Traditionally, the natural environment was the one larger system (e.g., Starik and Rands 1995) which broadened to also cover society (e.g., Elkington 2002). In contrast, CSR research used to take a normative perspective (Bansal and Song 2017). CSR research emphasized moral behaviors, esp. of managers (e.g., Bowen 1953), and stressed the need to consider stakeholders (e.g., Freeman 1984) which nowadays also include the environment (e.g., Bansal et al. 2014). I want to shed light on how companies may engage in a sustainable business conduct, e.g., given their resources, actions, and interdependencies. The traditional focus in CS research has been stressed as better suited for this objective (Bansal and Song 2017). Thus, I reside my work on the CS research stream.

Following previous research reviews, CS represents a company's voluntary addressing of its induced, stakeholder-related effects on economic, social and environmental dimensions along this company's value chain in the short and long run (Elkington 1994; Dahlsrud 2008; Porter and Kramer 2006; Montiel and Delgado-Ceballos 2014).

Already the definition of CS shows the inherent complexity of this construct. For example, scholars and practitioners are faced with reaching environmental, social and (not or!) economic objectives, whereby reaching each of them is a challenge in itself (Kleine and Hauff 2009). More so, these objectives shall be pursued in a way that meets

stakeholder interests and needs (Friedman 1970). However, stakeholder interests and needs can be conflicting which shall be mitigated by companies (Hahn et al. 2010). Furthermore, CS engagement shall be all-encompassing, i.e., that it covers the entire value chain of a company as well as short- and long-term horizons (Porter and Kramer 2006). Thus, it is easy to understand that CS can be overwhelming (Kleine and Hauff 2009) and outcomes from CS engagement are hard to predict (Yuan et al. 2011; Golob et al. 2014).

Indeed, the large body of research studying performance impacts of CS engagement has long shown inconclusive results (Margolis and Walsh 2003; Lu et al. 2014). Recent reviews of this research topic revealed an overall positive performance impact (Carroll and Shabana 2010; Albertini 2013; Lu et al. 2014). Nevertheless, puzzles remain on intermediating outcomes and influences, resulting shapes of relationships and methodological issues (Peloza 2009; Wood 2010; Orlitzky 2011).

Additionally, rising public awareness for protecting societies and nature from ruthless economic growth to preserve our planet (Elkington 1994; Bowen 1953) has led to an ever increasing number of companies engaging in CS (Sharma 2000; Lindgreen et al. 2009a). Such CS engagement needs to be dedicatedly managed. This fact has been stressed by scholars (e.g., Wood 1991; Margolis and Walsh 2003; Lindgreen et al. 2009b). Similarly, top-managers around the world have mentioned CS management (CSM) as one of their top three priorities in recent surveys (Bonini and Bové 2014; Snowden and Cheah 2015).

As CS is a complex construct, CSM needs to comprehensively capture and handle this complexity. However, this requirement cannot be met by existing frameworks and frequently used theoretical backgrounds (Starik and Kanashiro 2013; Lee 2008). Thus, a broadened background to systematically manage CS has already been requested (ibid.;

Margolis and Walsh 2003; Wood 1991). I want to contribute to providing such an advanced framework for CSM in my dissertation.

So far, scholars agree on core aspects of CSM. As such, CSM shall aim at addressing social, environmental and economic effects (Kleine and Hauff 2009; Montiel and Delgado-Ceballos 2014). For doing so, several CSM components are to be utilized like CS strategies (Wartick and Cochran 1985), principles of responsibility, processes of responsiveness, policies, or programs (Wood 1991). Additionally, there seem to be interdependencies in CSM which constitute a need for fit. For example, CS strategies shall be developed in line with business environments, company capacities and stakeholder demands (Porter and Kramer 2006). In other papers, CS practices are recommended to be aligned to existing company activities (Schneider et al. 2014). Consequently, practitioners are confronted with the choice between various CSM components which they shall align to address the interdependent social, environmental and economic effects (Kleine and Hauff 2009; Lindgreen et al. 2009b). Unfortunately, research offers insufficient guidance for such choices in practice (ibid.; Yazdani and Murad 2015; Baumgartner 2014; Yuan et al. 2011). This is particularly cumbersome as CSM is seen as basis for reaching implemented CS (Lindgreen et al. 2009b; Helmig et al. 2016) and resulting increased performance (Agudo Valiente et al. 2012; Miras-Rodríguez et al. 2015). Thus, a better understanding of CSM is not only important to progress research but also to better guide practitioners. This turns CSM into a particularly interesting topic for my dissertation.

The second focus of this dissertation resides in the fact that CS engagement and performance impacts have been found to be industry-specific (Margolis and Walsh 2003; Allouche and Laroche 2005; Peloza 2009), even company-specific (Porter and Kramer 2006; Poisson-de Haro and Bitektine 2015). However, most studies have taken an industry-

overarching approach (Maon et al. 2009; Valenti et al. 2014; Peloza 2009). Alleviating this mismatch, I will pay particular attention to energy companies. To my best knowledge, no energy-specific overview of CS research has been provided so far. Yet, energy companies yield a particularly insightful context for investigating CS engagement.

On the one hand, substantial public pressure for increased CS engagement by energy companies occurred early on (Bolton et al. 2011; Salzmann 2006), because they impose significant environmental, social, and economic risks (Lindgreen et al. 2012; Steger 2004). In particular, the production, transportation and supply of fossil- or renewable-based energy may cause long-lasting adverse environmental effects like air emissions worsening climate change, alterations to landscapes or biodiversity, and soil or water pollution (Frynas 2005; Rogall et al. 2016; Searcy et al. 2007; Salzmann 2006). Moreover, nuclear-based energy generation is debated with its unsolved quest for handling waste or dramatic consequences in case of disasters (Erdmann and Zweifel 2010; Flauger et al. 2011; dpa 2017). Furthermore, energy companies' operations cause social risks like potential unsafe, unhealthy work environments at oil platforms, large power plants or transmission lines (Hughey and Sulkowski 2012). Looking at economic risks, financially strong energy companies may tempt particularly underdeveloped, resource-rich countries to grant access to energy sources which would foster these countries' dependency on foreign income and corruption which hinder democratic development (García-Rodríguez et al. 2013; Frynas 2005; Klein and Prummer-Lehmair 2015). In addition, negative events worsened the external perception of energy companies like oil spills in the Gulf of Mexico in 2010 (Mobus 2012), the leak at the nuclear power plant in Fukushima (dpa 2011), or the illegal practices by the energy company Enron (Petrick and Scherer 2003).

On the other hand, a stable energy supply has proven as engine of progress – not only for economic activities but also for societal development (Ströbele et al. 2010; Parast and Adams 2012; Bolton et al. 2011). In this vein, energy companies have treated CS as strategic cornerstone early on (Steger 2004). One likely, yet not the only motivation was to maintain their license to operate (Bolton et al. 2011; Salzmann 2006). Their oftentimes multi-regional operations and needed access to energy sources require permission granted by various stakeholders, not only explicitly as contracts but also tacitly as acceptance rather than boycott (Porter and Kramer 2006; Salzmann 2006; Idemudia 2007). Additionally, rising intrinsic motivations by energy companies' managers have led to increased CS engagement (Pätäri et al. 2014; Herbohn et al. 2014; Abro et al. 2016; chapter 4).

As a result, energy companies are seen as pioneers, esp. in CS reporting (del Mar Alonso-Almeida et al. 2014; Pätäri et al. 2014). They also play a key role in reaching energy transitions decreed in several countries like the German Energiewende (Rogall et al. 2016; BMWi 2017). Such energy transitions constitute major changes for energy companies. Indeed, many are in the process of changing their business towards more renewable instead of fossil energy sources, more decentralized energy generation and accordingly needed new products and services (Poisson-de Haro and Bitektine 2015; Richter 2013; Ströbele et al. 2010). For example, O&G companies increasingly utilize natural gas being less harmful than oil, and indeed also renewable energy sources (Hubik 2017).

Overall, energy companies impose both, high sustainability-related risks and opportunities. Furthermore, they exhibit early initiated, ever increasing and partly pioneering CS engagement. Thus, energy companies offer great potential for rich insights on managing CS engagement in order to achieve desired impacts.

1.1 Objectives and research questions

This dissertation aims at improving our understanding of managing CS engagement successfully, so to reach implemented CS and increased CS-related performance. For doing so, I take a systems perspective. Such a systems perspective has been scarcely used in CSM, but it is expected to offer large potential (Bansal and Song 2017; Córdoba and Campbell 2008; Starik and Rands 1995). Therefore, I propose the CS system as advanced CSM framework. It is based on general systems theory and a comparable concept in human resource (HR) research, being so-called HR systems introduced by Huselid (1995). I refine the concept of a CS system using CSM insights from both, research and practice. The framework is suitable for considering influences from all levels of analysis, being the individual, company and institutional level. In this dissertation, I focus on the company level and highlight selected influences from other levels of analysis. This approach seems best-suited to fundamentally enhance our understanding of successful CSM from corporate perspective. Based on the proposed CS system, I offer explanations and first empirical evidence on how a CS system helps reaching implemented CS and performance impacts.

Additionally, I pay special attention to energy companies. Given their important role regarding sustainability and the lack of a research overview devoted to them, I aim at reviewing, discussing and thus advancing CSM of energy companies. This shall guide practitioners in energy companies to obtain increased success in implementing CS and enhancing their companies' CS-related performance. In total, energy companies produce, distribute, supply and / or trade energy using according infrastructure and different energy sources (Salzmann 2006; Ströbele et al. 2010; Göllinger 2012). Of course, these activities are split into different industries in which energy companies are active in. The energy industries being in focus in my dissertation are the oil and gas (O&G) industry, electric

utilities, municipalities, transmission and distribution system operators (TSOs, DSOs) (see chapter 3 for details).

For achieving my objectives, I characterize CS as complex construct requiring a particular management for which general systems theory, and esp. HR systems, are suggested as suitable background (chapter 2). Next to this general understanding of CS, I review existing research on CSM and performance impacts of energy companies (chapter 3). Among other aspects, the findings reinforce the need for an advanced CSM framework and for better capturing impacts on CS performance (CSP). Thus, I propose the CS system as advanced CSM framework based on research insights and findings of my qualitative study (chapter 4). For example, more precise, comprehensive and practice-oriented CS areas can be revealed. Moreover, I can show the relevance of particular CSM components and types of fit in the investigated companies connected to the energy sector. Throughout my dissertation, I reach the conclusion that implemented CS is a prerequisite for CSP impacts – a factor insufficiently stressed in existing research.

The understanding of reached CSP by properly managing CS as system is extended further by a quantitative study spanning several industries (chapter 5). Therein, I focus on the environmental dimension of CS, because higher quality data for reliable and valid results could be obtained for it – instead of all CS dimensions. Furthermore, the environmental dimension plays a particularly relevant role in CSM by energy companies (chapters 3, 4) and used to take a systems perspective in early works (Bansal and Song 2017).

Eventually, I can synthesize my insights and research results into implications for improving CSM by energy companies (chapter 6) and summarize limitations as well as promising research avenues (chapter 7).

Thanks to this procedure, my dissertation addresses several research questions (see table 1). Some of them are mentioned explicitly; others are only implied in the according chapters in order to ease readability.

Research question		Chapter
1i)	What characterizes CS and its management?	2
1ii)	Which theoretical background is well-suited for capturing CS, its management and impacts?	2
2i)	How is CS engagement managed by energy companies, i.e., which CS areas matter and which CSM components are used?	3
2ii)	Which performance impacts can energy companies obtain from CS engagement?	3
3i)	Which requirements exist for an advanced CSM framework?	4
3ii)	What does the CS system as suggested CSM framework contain?	4
3iii)	How do the parts of the CS system contribute to reaching implemented CS?	4
4i)	Is holistically managed environmental engagement associated with higher corporate environmental performance (CEP)?	5
4ii)	Does fit, particularly vertical coherence, influence this association between environmental management and CEP?	5
4iii)	Does fit, particularly company-internal consistency, influence this association between environmental management and CEP?	5
5)	How can practitioners in energy companies improve their companies' CSM for obtaining increased CS-related performance?	6

Table 1: Overview of research questions

1.2 Research methods used in dissertation

To answer these research questions, I apply a mix of research methods in my dissertation. Next to the provided overviews of CS research and general systems theory, I conduct a systematic research review using content analysis techniques (Bernard 2013; Stemler 2001) to synthesize existing knowledge on CSM and performance impacts for energy companies.

The revealed research gap of a CSM framework and expected better understanding of CSM in practice convince me to ground the CS system on interdisciplinary research and practice insights. Thus, I turn to general systems theory, esp. HR systems, and conduct a

qualitative study of CSM in seven energy companies and one of their direct suppliers. I theoretically sample these companies for their advanced CSM and analyze information from different data sources (Yin 2009). Thus, I can offer a refined CS system framework and provide explanations of complex, still weakly understood constructs like CS, its management and implementation (Russel 2000; Eisenhardt 1989). I reduce bias by coding information along a pre-defined coding scheme, and by conducting within- and cross-company analysis to sufficiently understand each company's approach and improving rigor and quality of results (Eisenhardt 1989; Yin 2009).

I further examine the suggested CS system in a quantitative, cross-industry study focusing on the environmental CS dimension in order to ensure high quality data inputs. I combine primary and secondary data from a total of three data sources, namely an administered online survey among key informants on environmental management in their company (Huber and Power 1985), Thomson Reuters EIKON, and the oekom corporate rating. This returns a sample of 147 large, public European companies. 56% of them are active in industries producing and distributing capital goods, materials and energy, as well as in transportation. Unfortunately, the sub-sample of 21 energy companies is too small for specific analyses. I test hypotheses for the cross-industry sample in a three step-procedure. First, I explore data and verify that the few missing values can be imputed. Then, I apply partially-least squares structural equation modeling (PLS-SEM) to test hypotheses (Hair et al. 2017). Lastly, I analyze data to avoid confounds of results due to potentially insufficient statistical power, biases and unobserved heterogeneity. Analyses show that insufficient statistical power, biases and unobserved heterogeneity do not confound the results of my quantitative study.

All in all, I am hopeful that the combination of several research methods puts the provided insights in my dissertation on more solid ground.

1.3 Structure of dissertation

My dissertation consists of seven chapters. Therein, chapters 3, 4, and 5 are self-contained research papers that can be considered for future publication. Thus, each of them contains an own introduction, description of methodologies and results, as well as a discussion and concluding remarks. Repetitions between these three and other chapters of this dissertation occur on purpose in order to facilitate an independent reading.

The chapters of my dissertation are connected as follows. After the currently read introduction, the second chapter provides the theoretical background and outlines important assumptions for my work. It summarizes the development of CS research in order to characterize CS as complex construct. Then, a solution for handling CS-related complexity is offered: general systems theory. I provide an overview of general systems theory as broad interdisciplinary background. In order to treat CS as a system, it has to meet system attributes outlined in general systems research. Therefore, I discuss CS along the typical attributes of systems and reach the conclusion that CS fulfills them all. Based on that, CS shall be treated as a system. For doing so, I turn to HR systems which have applied general systems theory in HR management (HRM) and successfully argue that not the single but the whole combination of HRM elements are relevant for reaching desired outcomes. I support previous statements stressing that HR and CS require similar management approaches, e.g., due to their mutual enforcing objectives and equally comprehensive, complex nature (Voegtlin and Greenwood 2016). Thus, elements and research insights from HR systems are worthwhile to consider for CS systems, too. I

outline constituent parts of HR systems like multiple areas to address, as well as diverse management components and fit as basis for a systems approach to CSM.

Additionally, I elaborate on the second focus topic in my dissertation: energy companies. Chapter 3 offers the first systematic CS research review devoted to energy companies. It provides an overview of frequently used theoretical backgrounds and their shortcomings. Moreover, I find typically relevant CS areas for companies in the different energy industries. Thus, the review underpins the necessity for industry-specific insights – even within one sector, here the energy sector. In contrast, mostly overarching CSM components are found. This finding suggests that either standard CSM components are applicable to all companies, or that increased clarity is needed on which CSM components matter when. Overall, this review can only reveal an incomplete list of CSM components. In any case, there seems to be an implicit structure along the purpose of CSM components – a finding supporting the need for further clarity on which CSM components matter when. Overall, the review reinforces the need for a better, theoretically sound CSM framework. In addition, energy companies are revealed to obtain overall positive performance impacts from CS engagement that are subject to several, yet incompletely captured influences and intermediate effects. A new CSM framework is also stressed as helpful for shedding further light on influences and intermediate effects towards performance impacts.

Offering such an advanced CSM framework is the objective of chapter 4. After deriving requirements for a CSM framework, I propose to manage CS as system itself that interacts, e.g., with the company system and the outer environment[1]. The CS system framework draws upon general systems theory, HR systems and their core constituent parts. I refine HR systems insights with findings from a qualitative study on CSM in eight

[1] I use the term outer environment as a whole covering, e.g., the natural environment, business environment, environments formed by stakeholders.

companies linked to the energy sector. The resulting CS system contains three constituent parts, namely CS areas to clarify the abstract CS dimensions, CSM components being structured along four levels according to their purpose, as well as fit within CS engagement, the company and outer environment. When presenting the CSM framework, I offer explanations on how each of its constituent parts contributes to reaching implemented CS as mindset for running business sustainably.

Chapter 5 extends empirical evidence on the CS system, particularly the environmental system (ES) as sub-system for environmental CS areas. I choose this focus for high quality data inputs, the relevance of environmental CS areas for energy companies, and the fact that CS research taking an initial systems perspective used to focus on environmental areas. In my study, I examine determinants of superior corporate environmental performance (CEP) using a dataset of 147 European companies in different industries. Results indicate that a holistic rather than selective environmental management is positively associated with increased CEP. Furthermore, this association is moderated by fit, esp. company-internal consistency.

In chapter 6, I synthesize my findings in order to offer implications for practitioners in energy companies. Therefore, I outline measures for improving CSM in light of the CS system and research results to ease reaching implemented CS and enhanced performance.

Finally, chapter 7 summarizes the contributions of my dissertation and provides limitations as well as promising paths for future research.

2 Background on corporate sustainability and its management

Since the 1950s, CS has gained rising attention and substance in research and practice (Bansal and Song 2017; Aguinis and Glavas 2012). Early works, e.g., by Polanyi (1944) or

Bowen (1953) highlighted the negative effects on human societies by the dominant paradigm focusing on economic success. As a result, there followed debates on the moral responsibility of managers who should take broader perspective in their decisions, e.g., on products or services, employee matters, regulations, or local communities (Murphy 1988; Preston and Post 1975). In addition, concerns began to rise during the 1960s that ruthless global economic development would eventually overstrain nature's capacity – with intact nature being an essential factor for the survival of economies, humankind and our entire planet (Starik and Rands 1995; Gladwin et al. 1995). Such concerns also set the start to global environmental policy with the United Nations (UN) Conference on the Human Environment in 1972 (UN 2017). Other key milestones towards CS were the so-called Brundtland report by the World Commission for Environment and Development (1987) defining sustainable development, and the introduction of the triple bottom line by Elkington (1994).

2.1 Corporate sustainability engagement and performance impacts

CS research faced a vivid debate until the early 2000s on whether companies should engage in CS or not. The debate was likely stirred up, because CS opposes the traditionally dominant paradigm focusing on economic success. The review of Garriga and Melé (2004) groups the arguments of this debate into four streams: i) an instrumental stream treating companies as instruments for wealth creation as ultimate objective being supported by social or environmental engagement; ii) an integrative stream claiming companies to simultaneously satisfy economic, social and environmental objectives; iii) a political stream looking at the responsible use of companies' power; and iv) an ethical stream emphasizing the moral responsibilities of companies to society. Today, scholars and practitioners widely agree that CS engagement is a mainstream topic (Kang and Lee 2016)

and common practice (Lindgreen et al. 2012; Singer 2016). Thus, it is not questioned anymore whether a company should engage in CS.

In parallel, scholars examined performance impacts from CS engagement, likely also to provide arguments for the above mentioned debate. The amount of performance-focused studies peaked during the 1990s and 2000s (Wood 2010; Carroll and Shabana 2010). However, there is "no single rationalization for how CS(R) improves the bottom line" (Carroll and Shabana 2010, p. 92), and research results remained inconclusive for quite some time. In general, scholars distinguished between impacts on CSP as operationalized outcome of CS engagement and subsequently achieved corporate performance (CP) impacts. Until today, several reviews of the mainly empirically examined research topic revealed overall positive impacts on both, CSP and CP (e.g., Orlitzky et al. 2003; Margolis et al. 2007; Wood 2010; Lu et al. 2014). Furthermore, they stressed the indirect nature of performance impacts covering different intermediate effects[2] like enhanced stakeholder relations (Barnett 2007), innovative capabilities (Surroca et al. 2010), newly tapped markets for increased revenues (Fromartz 2009), or saved resources which reduces costs (Carroll and Shabana 2010). In line with this, gaining legitimacy rather than sole profits has been found to be a driving force for CS engagement (Schaltegger and Hörisch 2017). Despite overall agreement, CS research on performance impacts still contains gaps, esp. regarding shapes of relationships (chapter 3; Steger et al. 2007)[3], intermediate effects and multi-level influences (chapters 3, 4, 5; Carroll and Shabana 2010; Peloza 2009), time

[2] Past studies defined mediating and moderating variables in deviating, imprecise manner (Peloza 2009; chapter 3). Therefore, I use the term intermediate effects instead.

[3] Past studies examined a virtuous cycle claiming that high past financial performance supports investments into CS which fosters future financial performance increase (e.g., Orlitzky et al. 2003; Carroll and Shabana 2010). I do not elaborate on this cycle for two reasons: Firstly, the multitude of intermediating effects limits reliable and valid assessment of this cycle, in my opinion. Secondly, I want to dedicate my work on how companies shall best manage their CS engagement, because this seems to be a more practice-relevant gap.

effects (Allouche and Laroche 2005) as well as measurement and other methodological issues (chapters 3, 5; Orlitzky 2011).

2.2 Managing corporate sustainability engagement

Scholars have repeatedly emphasized the need to better understand how companies should and do manage CS engagement (Margolis and Walsh 2003; Lindgreen et al. 2009b; Wood 2010). It seems that such research calls are at least partly based on the premise that positive performance impacts are reached, if CS engagement is dedicatedly managed to get CS implemented in a company. This premise has been in early CS research (e.g., Carroll 1979; Wood 1991) and has received more empirical support recently (Mio 2010; Agudo Valiente et al. 2012; Miras-Rodríguez et al. 2015; Helmig et al. 2016; chapter 5). Actually, CSM is a revived rather than a new topic in CS research. It faced a phase of reduced attention due to overriding interest in performance impacts.

Already Buehler and Shetty (1975) and Holmes (1978) investigated different CSM components used by major companies in the USA like clear policies, CS-related structures, and defined action programs. The model by Carroll (1979) included a differentiation of CS engagement between reactive, defensive, accommodative, and proactive which could be mapped to respective denying, fighting, complying, and anticipating CS strategies (Wartick and Cochran 1985). To complete this short overview of early CSM research, the widely-recognized model by Wood (1991) entailed companies to orchestrate their principles of responsibility, processes of responsiveness, policies, programs, and other CS-related outcomes. Until today, CSM scholars keep on mentioning these CSM components (e.g., Maruffi et al. 2013; Dobele et al. 2014). In total, CSM components shall be used to address stakeholder-related effects along social, environmental and economic dimensions (Dahlsrud 2008; Elkington 1994). More recently, CSM research elaborated more on

interdependencies. For example, CS strategies shall be developed in line with business environments, company capacities and stakeholder demands (Porter and Kramer 2006), or CS practices shall be aligned to already existing activities in a particular company (Schneider et al. 2014).

Unfortunately, existing CSM research offers insufficient guidance for practitioners on how to choose and configure CSM components (Starik and Kanashiro 2013; Lindgreen et al. 2009b). CSM research contains a gap regarding a more granular, structured view on social, environmental and economic dimensions, i.e., on CS areas (chapter 4). As shown by my literature review, CS areas mentioned across studies vary greatly (chapter 3). Moreover, research lacks guidance on how to handle interdependencies in CSM. The related need for fit has been raised; yet, insights and especially empirical studies remain scarce (Yuan et al. 2011). All in all, my work aims at advancing CSM research by addressing these gaps. Any attempt to manage CS engagement requires a fundamental understanding of CS as construct. Therefore, I elaborate it in the next section.

2.3 Characteristics of corporate sustainability as complex construct

To understand CS as construct, it is crucial to define and characterize it (Suddaby 2010). I have already provided the definition of CS (chapter 1). Here, I elaborate on characteristics of CS as complex construct (Wood 2010).

First of all, CS is multidimensional as it spans economic, social and environmental dimensions (Margolis and Walsh 2003), short and long time horizons (Vaaland and Heide 2008), and different stakeholder-related effects (Dahlsrud 2008; Freeman 1984). Moreover, CS contains inherent trade-offs (Hahn et al. 2015). For example, companies shall pursue dependent, but not necessarily congruent objectives simultaneously like fostering energy access in rural regions in Brazil and avoid any damage to the rainforest in these regions

(Ströbele et al. 2010; Matos and Silvestre 2013). Moreover, stakeholder expectations may be conflicting like the interest of coal miners in secured jobs and environmental groups demanding to stop electricity generation from coal (Clarkson 1995; Bansal and Song 2017). Scholars agree that CS cannot be reached by focusing on a single CS dimension, time horizon or stakeholder group; rather, it is a matter of balance (Kleine and Hauff 2009; Starik and Kanashiro 2013). Hahn et al. (2015) provide guidelines and examples for measures to better cope with trade-offs in CS as multidimensional construct.

Furthermore, CS is complex as there is not a single correct approach for CS engagement. Instead, CS is specific to every company and its outer environment (Margolis and Walsh 2003; Porter and Kramer 2006). However, the context of a company and its outer environment change over time. Thus, CS changes accordingly (Bansal and Song 2017; Maon et al. 2009). It is worth noting that the specific and evolving character of CS underlines that there is one unique path of becoming sustainable for each company. Therefore, I reinforce previous requests that all companies, incl. those in controversial industries, shall tackle this journey (Lindgreen et al. 2012). In line with these authors, I reemphasize that controversial companies cannot be assumed to be unsustainable per se. They rather need to undertake deeper changes and be granted adequate time for doing so.

Thirdly, the complexity is increased by the fact that CS shapes and is shaped by various influences. Companies that engage in CS do so in a broader context considering many individuals, e.g., who work for or with them, or buy their offerings (Starik and Rands 1995). Thus, CS covers all levels of analysis, being the individual, the company, and the institutional level, and all these levels influence CS engagement (Bansal and Song 2017)[4]. For example, movement towards a more sustainable business conduct at many companies

[4] I refer to the institutional level also as outer environment.

can be initiated by public boycotts or regulations (Mirvis 2000; Bansal and Roth 2000) as well as individual convictions of influential decision-makers like top-managers or advisory board members (Schaefer 2004; chapter 4). At the same time, CS engagement by companies was found to influence regulations (Poisson-de Haro and Bitektine 2015), to foster sustainable conduct along international supply chains (Leppelt et al. 2013) and to influence consumer purchase decisions (Becker-Olsen et al. 2006).

All in all, the complexity of CS can neither be neglected nor avoided. Instead, it is suggested to be captured sufficiently for shaping it. In a nutshell, this is the task of CSM. In order to detail this task and to provide a frame of reference, a theoretical background needs to be provided that is suitable for capturing complexity.

2.4 Capturing complexity in line with general systems theory

For capturing the complexity in CS, scholars have stressed general systems theory as well-suited background (Starik and Rands 1995; Córdoba and Campbell 2008; Grothe and Rogall 2013; Göllinger 2012). Traditionally, a systems perspective was taken by the CS research stream, in contrast to the more normative CSR research stream (Bansal and Song 2017). CS scholars argued that companies are part of a larger system like the natural environment with several complex interdependencies (Gladwin et al. 1995; Starik and Rands 1995). Thus, companies shall not endanger the larger system being the basis for their existence (ibid). Eventually, the larger system also covered society (e.g., Elkington 2002). For the last 20 years, however, CS research based on general systems theory was almost dormant. I follow the call by Bansal and Song (2017) to revive it.

I base my work on general systems theory as it offers great opportunities for advancing CSM. More so, general systems theory mitigates shortcomings in other commonly utilized theoretical backgrounds in CS research. As such, stakeholder theory

(Freeman 1984) requires to meet several stakeholders' needs. However, it remains unresolved how to cope with opposing interests of stakeholder groups (Lee 2008). Institutional theory and contingency theory focus on influences to corporate management. Institutional theory (Thompson 1967; Donaldson 2006) claims that a company shall meet beliefs and rules in its business environment, often specific to a country. Contingency theory (DiMaggio and Powell 1983) was mainly used to stress that each company has its own internal and external influences which shape this company's management. For both theories, the considered sets of influences and management components are limited. Thus, it does not reflect the multidimensional characteristic of CS (Starik and Rands 1995; Poisson-de Haro and Bitektine 2015). Frequently used theories of the firm like the resource-based view (RBV) also take a reductionist perspective. The RBV is suited to examine VRIN (valuable, rare, inimitable and non-substitutable) resources and capabilities, and how they may lead to competitive advantages of companies. But it lacks guidance on how to obtain and manage such VRIN resources and capabilities, also in the field of CSM (Wood 2010; Lee 2008).

Consequently, Starik and Kanashiro (2013, p. 14) criticized all these theories for being "too simplistic and static to fully explain the complexity of the paradoxical demands inherent in the management of sustainability". Instead, managing CS as complex construct requires knowledge from several disciplines in social science like strategic management, sociology, anthropology; in natural science; philosophy; and in professional fields like medicine or education (Starik and Kanashiro 2013; Wood 2010). General systems theory is such an interdisciplinary background (von Bertalanffy 1950).

The seminal work on general systems theory has been provided by von Bertalanffy (1950). As biologist, he investigated living organisms and their internal complex organization to ensure survival. Then, he suggested transferring such insights to other

disciplines like social sciences. This has led to a rise of according research (Göllinger 2012). In social science, general systems theory has been further developed, esp. by applying it to organizations. This required defining core concepts related to social systems. First and foremost, delineating a social system was of major relevance. According to Luhmann (1984, 2017), every social system has to be distinguishable from other social systems to be a social system in itself. Therefore, a social system emerges when it is observable by being distinct from other social systems, e.g., shown in messages, looks, or members being part of the system. This constitutes so-called autopoiesis (self-creation) of social systems by Luhmann (1984). Moreover, social systems show self-reference, i.e., they use their own internal interactions, structures, or processes in order to turn inputs into outputs (Luhmann 1984, 1996). In this vein, a company was defined as social system in which structures, processes, other elements and inputs work towards a common objective as output (Katz and Kahn 1978). Moreover, a company was argued to only emerge for a societal purpose (Ulrich 1984). In case of changing external influences from other systems, adaptions in a company have to take place for reaching its purpose (ibid.). Consequently, social systems can and shall be managed (Parsons 1951; Ulrich 1984; Malik 2008; Luhmann 1984).[5] The latter is a core assumption for using general systems theory in CSM research.

In my dissertation, three fundamental aspects scope how general systems theory is applied: The taken approach, the followed research stream and insights from an existing systems concept in social science.

First, my goal is to revive general systems theory in CSM research using existing concepts, rather than defining new concepts. Thus, I take a more practice-oriented

[5] For further insights on the evolution and different streams of general systems theory, existing publications are worth reading in addition to this short summary (e.g., Luhmann and Baecker 2017).

approach by using existing theoretical concepts and developing a framework which can be applied and empirically examined. I will further elaborate on these considered concepts, esp. system attributes in section 2.6.

Secondly, it is important to note that a mainstreaming of general systems theory in social sciences has been hindered, partly due to its diverging research streams with hard-to-align assumptions (Porter 2008). Therefore, scholars using general systems theory need to state which stream they follow. In CS-related research, there are two main research streams in general systems theory. The first stream focuses on system thinking wherein sustainability is treated as human attribute (Maon et al. 2008; Golob et al. 2014; Knez-Riedl et al. 2006). Thus, individual human personality determines CS engagement. Humans may become more sustainability-oriented and consider more holistic impacts of their actions leading to larger CS engagement. This stream only indirectly yields insights on how CS engagement may be successfully managed at company level. Consequently, my dissertation resides in the second stream which refers to phenomena as systems in order to shed light on how their internal complexity may be managed (Bansal and Song 2017; Luhmann and Baecker 2017). Previous works using the second stream have treated a project (Vrečko and Lebe 2013) or a broad set of stakeholders (Mason and Simmons 2014) as systems. Moreover, CS was seen as one objective of a company system (Yuan et al. 2011; Grothe and Rogall 2013). These approaches seem insufficient for progressing our understanding on successful CSM: Projects are too limited in scope; CS as just another objective in a company system is too abstract for a limited human attention span; and a stakeholder instead of a company perspective helps little on how to precisely manage CS engagement as a company. In contrast, I suggest treating CS as a system itself which requires dedicated management in order to receive performance impacts.

Thirdly and based on the same research stream that I will take, scholars have developed so-called HR systems (e.g., Huselid 1995; Lado and Wilson 1994). HR systems are part of a company system and are now a well-established construct in HR research (Zhang et al. 2014; Ostroff and Bowen 2016). As I expect a CS system to be also part of a company system, I will shed light on what might be learnt from HR systems next.

2.5 Learning from human resource systems

The construct of HR systems has mainly been shaped by Huselid (1995)[6], advanced by later studies (e.g., Becker and Huselid 2006; Posthuma et al. 2013; Kepes and Delery 2007; Bowen and Ostroff 2004) and remains well-established in HR research until today (Zhang et al. 2014; Subramony 2009; Kehoe 2019; Snell and Morris 2019). The HR system was coined in times where the positive business case for companies received high attention. Managing employees effectively turned out to not only be good practice but to also show enhanced bottom line results (e.g., Pfeffer 1998).

The first contribution by Huselid (1995) and the HR system is his successful argumentation that "effective systems of HRM practices (...) help to implement a firm's competitive strategy (...) [added: and] sustained competitive advantage" (p. 636), instead of selected HRM practices. So, one should not look at the single but the whole combination of HRM practices. He constructed a system of HR practices that address employee motivation, skills and organizational structures. He showed that the HR system is crucial for analyses of companies' performance impacts, because a selection of HR practices yielded biased and inconclusive results. As such, the HR system yielded positive impacts on different measurements of companies' financial performance in his study – a finding

[6] Huselid (1995) used the term systems of high performance work practices. The term of HR(M) systems got established in HR research in the following years including works by Becker and Huselid (2006) and Kepes and Delery (2006).

supported by following research reviews (e.g., Becker and Huselid 1998; Combs et al. 2006).

Looking at CS research, there is a great variety of CSM components (Vidal et al. 2015; chapter 3) which can easily be seen as more effective when being used in combination, rather than isolation (Starik and Kanashiro 2013; chapter 4). The inconclusive results on performance impacts (Carroll and Shabana 2010; Lu et al. 2014) may equally be caused by inconsistently chosen CSM components across studies – a fact already criticized by previous research reviews (Aguinis and Glavas 2012). Thus, a CS system could help advancing CS research overall and studies on performance impacts in particular.

Secondly, Huselid (1995) stressed that "effective systems of HRM practices (...) simultaneously exploit the potential for complementarities or synergies among such practices" (p. 636). He emphasized the relevance of fit as one of the first scholars turning fit into a cornerstone of HR systems. Huselid (1995) elaborated on complementarities among practices (comparable to coherence in later research) and the degree of alignment of HR practices and a company's strategy (comparable to company-internal consistency in later research). Having to use exploratory measurements, his study yielded widely insignificant results for those types of fit. Unfortunately, fit in HR systems remains scarcely empirically tested until today (Caldwell et al. 2011). Regardless, important conceptual advancements exist. Scholars working on HR systems distinguish four types of fit, namely vertical and horizontal coherence within HR systems plus company-internal and -external consistency of HR systems with their surrounding systems (Kepes and Delery 2007; Kehoe 2019).

In CS research, different kinds of interdependencies and the need for fit have already been stressed (Yuan et al. 2011; Porter and Kramer 2006; Schneider et al. 2014). Thus, HR systems with their different types of fit may again help advancing CS research. However, the measurement of fit in empirical studies remains exploratory and enhanced measurements need to be developed.

Thirdly, Huselid (1995) focused the HR system on HR practices addressing employee motivation, skills and organizational structures. Despite being grounded in latest insights from research and practice at that time, later works extended HR systems in two ways, across levels and areas. First, the conceptualization of HR systems brought forward the need to differentiate between different components having distinct purposes in managing HR. This turned HR systems into multi-level constructs (Ostroff and Bowen 2016). As such, there are guiding values (so-called philosophies), objectives in HR strategies and defined HRM roles (so-called policies), programs to formalize HR-related activities (so-called practices) and their execution in everyday business (so-called processes) (Kepes and Delery 2006; Arthur and Boyles 2007). Secondly, areas to be addressed by HR systems got extended. Research reviews revealed broader areas and more granular questionnaires than the one used by Huselid (1995). For example, the following areas are requested to be covered: compensation and benefits, job and work design, training and development, recruiting and selection, employee relations, communication, performance management and appraisal, promotions, turnover / retention and exit management (Posthuma et al. 2013).

Looking at CS research, distinct purposes of the various CSM components have been implied. As such, the model by Wood (1991) distinguishes principles of responsibility, processes of responsiveness, and CS-related outcomes like programs. Other studies

differentiate between programs, roles and objectives of CS (e.g., Buehler and Shetty 1975; Aragón-Correa 1998). Thus, it seems fruitful to structure CS management components according to their purpose along a multi-level construct. The above mentioned levels of HR systems may serve as relevant basis for doing so.

Furthermore, the multidimensional scope of CS requires to not only consider different purposes of CSM components but also to address different CS areas along the economic, environmental and social dimensions. Reviews of mentioned areas in CS research and in practice may serve as starting point.

As fourth learning, Huselid (1995) already proposed to cover more direct performance measures to HR practices to shed light on the 'black box' between HRM and companies' financial performance. Thus, he analyzed the impacts of HR systems on employee turnover and productivity – obtaining positive results in his study. More recently, Pfeffer (1998) and Becker and Huselid (2006) stressed the need to assess the degree of implementation as key intermediate outcome to enlighten the 'black box' further.

Comparably to HR research, also CS research shows a 'black box' between CSM and CP impacts. This 'black box' is increasingly narrowed by analyzing intermediate outcomes (Carroll and Shabana 2010; Lu et al. 2014). Additionally, CS scholars suggested investigating the degree of CS implementation as intermediate outcome (Lindgreen et al. 2009b). This further extends the learning potential from HR systems for CS research.

Last but not least, it is important to stress that HR and CS research are increasingly combined, because managing HR and CS requires similar approaches and is mutually supportive (Voegtlin and Greenwood 2016; Jamali et al. 2015; Morgeson et al. 2013). Thus, insights on HR systems can be transferred to CS systems.

In any case, I may only treat CS as a system, if CS meets system attributes postulated by general systems theory. Thus, I discuss such attributes in light of CS research next.

2.6 System attributes of corporate sustainability

Existing research contains different attributes of systems. I focus on attributes of social systems in my dissertation (e.g., von Bertalanffy 1950; Ulrich 1984; Luhmann 1984). Discussing these attributes for CS, I outline the theoretical basis and assumptions for my work.

First of all, social systems are "sets of elements" (von Bertalanffy 1950, p. 38) "in which people work together in order to satisfy societal functions" (Ulrich 1984, p. 80). There are many, diverse CS areas and CSM components (Lindgreen et al. 2009b; Vidal et al. 2015) which can be seen as constituent parts of CS systems. They are best handled in a collaborative approach (Yuan et al. 2011; Paine 1994) to reach the economic, environmental and social objectives of CS (Dahlsrud 2008; Elkington 1994).

Secondly, holism is a core attribute with a comprehensive set of elements in a system being nested within other systems and the outer environment (von Bertalanffy 1950; Luhmann 1984). The need to comprehensively capture CS areas and components to manage them has been stressed previously (Starik and Kanashiro 2013; Lindgreen et al. 2009b). Additionally, CS engagement has to happen in line with a company's activities (Grothe and Rogall 2013; Göllinger 2012). So, CS is part of a company system. This company system is part of the outer environment that matters for CS like business environments in specific industries (Ulrich 2001), natural environments (Bansal and Song 2017) or stakeholders (Mason and Simmons 2014).

Thirdly, system elements interact in order to jointly turn inputs into outputs (Ulrich 1984). If interacting elements show positive fit, the output of a system as a whole will be

larger than the sum of outputs of its single constituent parts. Looking at CS, interaction in terms of interdependence has been discussed among CS areas (Kleine and Hauff 2009; Hahn et al. 2010) and CSM components (Baumgartner 2014; Maon et al. 2009). Moreover, increased CSM success has been emphasized when CS interacts well with a company's strategy (Mosher and Smith 2015), its core business (Yuan et al. 2011), stakeholder needs (Mason and Simmons 2014), and carrying capacity of nature (Starik and Rands 1995). Thus, interactions are not limited to constituent parts in one system; rather, systems also interact with other systems and the outer environment (von Bertalanffy 1950).

Fourth and connected to these interactions, social systems are both, closed and open to a certain extent (Luhmann 1984). Systems are closed to secure their distinct aspects from other systems and their self-reference, i.e., using their own internal interactions, structures, or processes. Openness allows the exchange between systems and the outer environment. This exchange involves a screening of relevant inputs, before inputs get access into a system. Looking at a clearly definable construct CS, it is possible to distinguish a CS system, e.g., from an HR system (Montiel and Delgado-Ceballos 2014; Voegtlin and Greenwood 2016). Furthermore, considering stakeholder demands is an example for selective openness of CS as a system (Porter and Kramer 2006; Maon et al. 2009).

As fifth attribute, systems are dynamic (von Bertalanffy 1950). Such dynamics constitute the need to establish flexible fit over time (Ulrich 1984) and result in hard-to-predict system outputs (Göllinger 2012). For CS, many constituent parts have been found to change over time like a CS strategy (Egels-Zandén and Rosén 2015) or the entire scope of CSM (Bansal 2005; Poisson-de Haro and Bitektine 2015). Flexible fit is represented by the continuous improvement and refinement of CSM to best address stakeholder-related effects in light of a company's capabilities (Maon et al. 2008). Furthermore, long

inconclusive research results on CS-related performance impacts (Carroll and Shabana 2010) underline that CS outcomes are hard to predict.

Sixth, systems show equifinality, i.e., that the "same final state may be reached from different initial conditions and in different ways" (von Bertalanffy 1950, p. 40). First findings suggest equifinality of CS like different CSM components being utilized for reaching the same goals (Vidal et al. 2015; Herzig and Schaltegger 2009). This also implies that there is no single best way of managing CS (Buller and McEvoy 1999; ISO 2016).

Last but least, social systems and their constituent parts can be managed to a certain degree. Instead of rigid beliefs in entire self-organization of systems (Kauffmann 1993), I follow Parsons (1951), Ulrich (1984) and Luhmann (1984) who claim that systems change gradually to reach their purpose or at least survival given changing external influences from other systems. For this reason, structural parts are assumed to exist in a system. Structural parts are stable (not static) against short-term changes (Parsons 1951). Structural parts need to be managed to ensure a system's survival (ibid.; Ulrich 1984). The other elements adjust faster to changing other systems and the outer environment allowing systems to reach flexible fit (ibid.). In CS research, several studies have revealed superior outcomes, when CS is dedicatedly managed (Torugsa et al. 2013; Bolton et al. 2011; Mirvis 2000) and at the same time adjusted to specific contexts (Porter and Kramer 2006). Furthermore, scholars have found that CS elements do not alter instantly, but they take time to be adjusted when outer environments change like regulations or competitive pressures (Poisson-de Haro and Bitektine 2015; Delmas et al. 2007b).

All in all, CS fulfills all system attributes. Based on past CS research, I can say that

i) CS contains several elements like CS areas and CSM components as joint set.

ii) Holism is crucial in CSM, e.g., with a comprehensive view on CS elements and how CS is incorporated in a company system or outer environment system.

iii) Interaction among CS elements and other systems matters for the impact of CS engagement.

iv) CS engagement is a defined, so distinguishable construct forming a closed system; and that CS engagement forms also an open system, because external influences like stakeholder needs shape CS elements like prioritized CS areas.

v) CS engagement is dynamic, i.e., that it changes over time with hard to predict outcomes.

vi) CS engagement is specific to each company with reached outcomes that may be achieved via different approaches.

vii) CS elements can be shaped, so managed which forms the basis for CSM.

Consequently, CS can be treated as system. Based on this finding and the similarities between HR and CS management outlined previously, I may transfer HR system insights to CS systems. I will introduce and empirically examine the CS system in chapters 4 and 5 of my dissertation. Beforehand, I deepen our understanding on CS in energy companies in chapter 3.

3 Corporate sustainability of energy companies: What we know and need to understand better regarding its management and performance impacts

by Stefanie Priemer

Abstract

Energy companies play a crucial role in preserving our planet, ensuring economic stability and fostering social equity. Thus, they have been a focus of sustainability-related work in research and practice early on. This paper offers the first energy-specific sustainability research review of 65 sources published between 2000 and 2016. It pays particular attention on how corporate sustainability is managed by energy companies and which performance impacts are obtained. Findings reveal typically relevant areas to focus on in different energy industries and CSM components which are applied similarly across energy industries. Furthermore, energy companies are found to obtain overall positive performance impacts from sustainability engagement that are subject to several outlined influences. Last but not least, limitations in the so far used theoretical backgrounds are discussed. Based on this, research calls are reinforced for a broadened theoretical basis being able to comprehensively capture sustainability, its management and impacts as complex, interdependent constructs.

3.1 Introduction

A stable energy supply has proven to be an engine of progress – not only for economic activities but also for societal development (Ströbele et al. 2010; Parast and Adams 2012; Bolton et al. 2011). Moreover, humans are also increasingly aware that energy needs to be supplied in harmony with nature's capacity (Holmes 1978; Sharma 2000).

Consequently, energy companies yield both, significant contributions and risks to sustainability. Public pressure for the sustainability of energy companies has increased, also due to oil spills like the one in the Gulf of Mexico in 2010 (Mobus 2012), or unethical and even illegal practices revealed in the Enron scandal (Petrick and Scherer 2003). Moreover, some energy companies are blamed for collaborations with undemocratic governments to ensure access to natural resources (Klein and Prummer-Lehmair 2015). Thus, energy companies are confronted with all three dimensions of sustainability, namely economic, social, and environmental sustainability (Elkington 1994).

Of course, energy companies reacted to such pressures: They increased their engagement in sustainability (Pätäri et al. 2014; Herbohn et al. 2014) and have treated it as strategic cornerstone early on (Steger 2004). Thus, energy companies are seen as pioneers, e.g., in sustainability reporting (del Mar Alonso-Almeida et al. 2014).

Despite this relevance of sustainability for energy companies and calls for more sector-specific insights (van Beurden and Gössling 2008; Allouche and Laroche 2005; Steger 2004; Peloza 2009), no systematic research review in this field exists to my best knowledge. Only Pätäri et al. (2014) provided a selective literature overview within their empirical paper. Thus, it deems necessary to dedicatedly examine what is known about sustainability engagement of energy companies and which research paths can help advancing our understanding in the future.

In general, there is an extensive body of research on sustainability and increasingly converging terms like corporate social responsibility (Montiel 2008; Carroll 2015; Bansal and Roth 2000; Bansal and Song 2017). I focus my work on corporate sustainability (CS) which is defined as a company's voluntary addressing of its induced, stakeholder-related effects on economic, social and environmental dimensions along its value chain in the short and long run (Dahlsrud 2008; Montiel and Delgado-Ceballos 2014; Elkington 1994). CS is already well-established in strategic management research (Robertson 2008) which underpins the high interest on how companies shall engage in CS in order to achieve desired impacts (Margolis and Walsh 2003; Wood 2010). Consequently, this research reviews aims at answering two questions:

i) How is CS engagement managed by energy companies, i.e., which CS areas matter and which CS management (CSM) components are used?

ii) Which performance impacts can energy companies obtain from CS engagement?

Managing CS involves the addressing of CS areas like environmental protection or social equality. Moreover, there are a variety of instruments, actions, initiatives etc. used to manage CS, i.e., to address CS areas. Hereafter, such instruments, actions, initiatives etc. are referred to as CSM components.

Findings reveal typically relevant CS areas to focus on in different energy industries. In contrast, I find CSM components that are similarly used across energy industries. Both, CS areas and CSM components seem to be quite randomly mentioned and weakly structured. Furthermore, energy companies are found to obtain overall positive performance impacts from CS engagement along indirect relationships facing diverse influences. Last but not least, so far used theoretical backgrounds have relevant limitations.

All in all, this paper offers important contributions: It provides a first systematic review of energy-specific CS research. Furthermore, it synthesizes our current knowledge on energy companies' CSM and achieved performance impacts in order to both, outline promising paths for future research and guide best-practice CS engagement of energy companies in practice.

In order to retrieve these findings and contributions, the paper firstly introduces the energy sector, followed by a methodological overview of the conducted systematic research review. Then, findings are elaborated along the review questions. Finally, findings are discussed and suggestions for further research are provided.

3.2 Energy sector

To better understand CSM and resulting performance impacts for energy companies, I introduce the energy sector, its industries, business trends and challenges.

The energy sector produces, distributes, supplies and trades energy using according infrastructure (Salzmann 2006; Ströbele et al. 2010; Göllinger 2012). There are different forms of energy: Primary energy covers raw energy sources like gas, solar, or nuclear power. Primary energy often requires further conversion, esp. into secondary energy, better known as electricity. Electricity is either used directly or further transformed into other usable forms of energy like heat or light (Erdmann and Zweifel 2010). Electricity is a commoditized product (Rebhan 2002) whereas the mix of primary energy sources can serve as differentiation (Delmas et al. 2007b). Figure 1 on page 50 reflects the sector's value chain and according industries.

Oil and gas (O&G) industry companies are active in upstream (exploration, production of crude O&G), midstream (processing, storage, transportation and marketing of O&G)

and downstream activities (refinery, petrochemical processing, sale of O&G products) (PSAC 2015; PetroStrategies 2015). They are either specialized on few of these activities, or integrated covering all these activities. Regardless, they mostly work multinationally to tap O&G reserves (Salzmann 2006). O&G are fossil energy sources. Not only this fact but also "widespread engagement in unscrupulous business practices that entail adverse social, environmental, and ethical consequences" (Du and Vieira 2012, p. 413) have turned esp. the oil industry into a controversial industry (Klein and Prummer-Lehmair 2015).

As second industry along the energy value chain, electric utilities generate and sell electricity to businesses and consumers (Poisson-de Haro and Bitektine 2015). They may also offer additional services to their customers like consulting for increased energy efficiency (Salzmann 2006). One distinguishing feature among electric utilities is their energy mix, so the energy sources used for generating electricity. Fossil energy sources, being O&G and coal, are increasingly criticized for their adverse environmental effects like high greenhouse gas emissions fostering climate change (Erdmann and Zweifel 2010). Moreover, finite reserves of fossil energy sources entail more complicated and risky production like fracking (Ströbele et al. 2010). Similarly, nuclear energy sources impose high risks that cause extensive public debates. Opponents underline the wide-reaching, long-lasting adverse effects in case of disasters as well as the still unresolved issue of treating nuclear waste (Erdmann and Zweifel 2010; Flauger et al. 2011). In contrast, proponents argue that nuclear energy generation is comparably cheap, causes minimal greenhouse gas emissions, and offers stable electricity supply (Flauger et al. 2011). Furthermore, there are renewable energy sources which span biomass, geothermal, hydro and tidal energy, solar, as well as wind energy (Ströbele et al. 2010). Surely, they impose the lowest environmental risks compared to the above mentioned energy sources (Delmas et al. 2007b). However, their ecological footprint is not yet optimal, e.g., due to changed

landscapes for hydroelectric power stations or large wind or solar parks in order to generate sufficient electricity (Ströbele et al. 2010). Other drawbacks of electricity generation using renewable energy sources are lower efficiency rates and fluctuating availability leading to the need for better energy storage solutions (Rogall et al. 2016).

Like electric utilities, municipalities engage in generating and selling electricity or other forms of energy, as well as related services (Auer and Heymann 2012). However, electric utilities operate across regions, an entire country or even several countries; whereas municipalities operate at local level. Another difference is the special ownership of municipalities: Many are owned by the community they are active in. Therefore, municipalities' core purpose is to supply energy or other public services[7] to this particular community (Wagner and Hense 2016).

Two other industries being responsible for the transportation of electricity in the energy value chain work closely with electric utilities and / or municipalities. On the one hand, transmission system operators (TSOs) transport the generated electricity against system usage charges in their own high voltage grids (Ströbele et al. 2010). The main task of TSOs is to secure grid stability and uninterrupted electricity supply, mostly at high-voltage (Erdmann and Zweifel 2010). On the other hand, distribution system operators (DSOs) own and operate low- and medium-voltage grids which span a smaller geographical region than TSOs (Erdmann and Zweifel 2010). Municipalities often act as DSOs to better manage the increasingly decentralized energy generation by industrial plants and so-called prosumers being energy producing consumers (Auer and Heymann 2012; Schiwek 2015).

[7] So-called multi-utilities are municipalities that also provide water management, waste management and / or local public transportation.

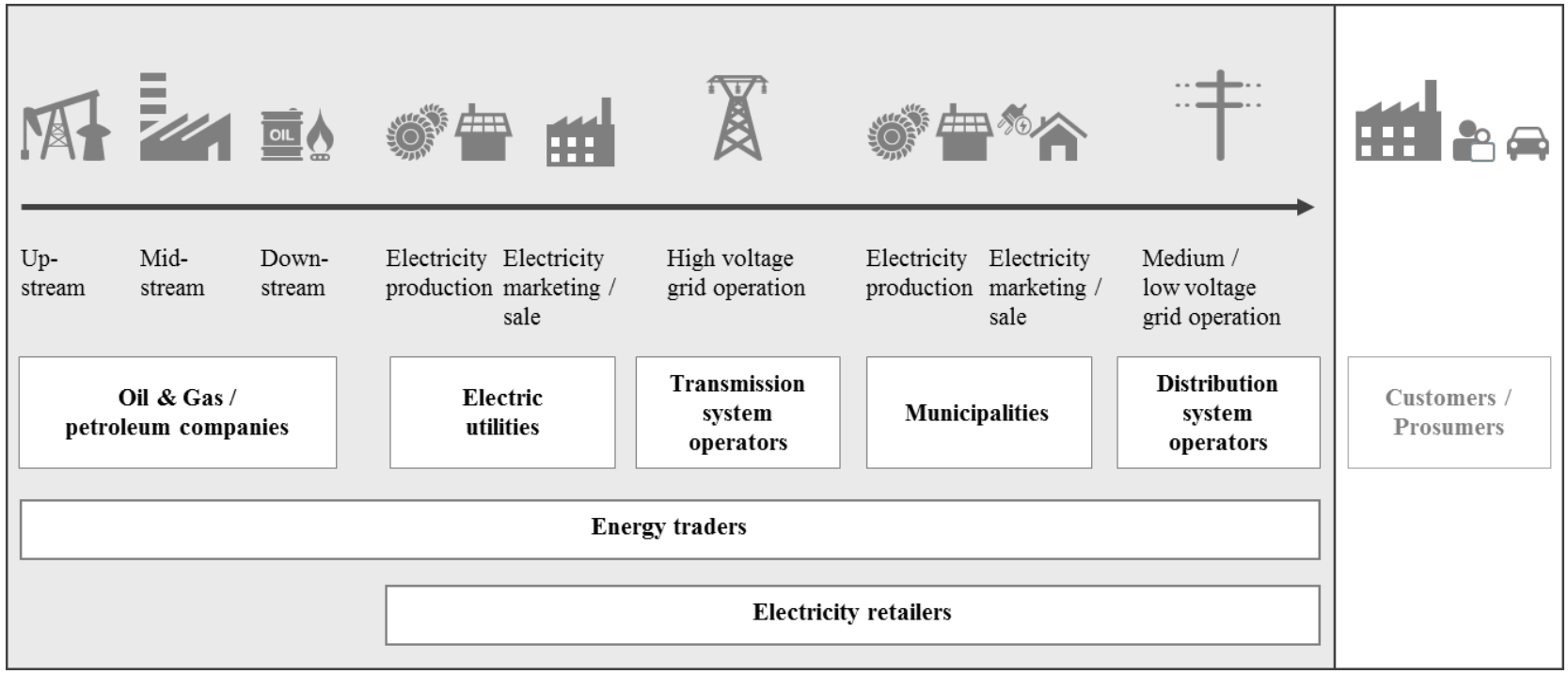

Figure 1: Value chain of energy sector including industries (own illustration; simplified overview for energy system in developed economies; based on Salzmann 2006; Ströbele et al. 2010; EEX 2015; EFET 2015; PSAC 2015; PetroStrategies 2015; Searcy 2005; Poisson-de Haro and Bitektine 2015; Erdmann and Zweifel 2010; Tamme 2002; Auer and Heymann 2012; Siemens AG 2014; icons by Siemens Management Consulting, 2015)

Completing the explanation of energy industries shown in figure 1, two more players shall be mentioned: Energy traders sell and buy energy at special exchanges for earning returns (EEX 2015; EFET 2015). Banks as well as companies from any of the above explained industries may act as energy traders (Spicker 2012). Furthermore, there are retailers that sell electricity purchased from spot markets or pools (Spicker 2012). Both frequently lack own energy production and transportation capacity which limits insights on CSM and according impacts. Thus, this review focuses on O&G companies, electric utilities, municipalities, TSOs and DSOs.

Looking at business trends and challenges, the energy sector faces a rising global demand for both, primary and secondary energy (Erdmann and Zweifel 2010). Given long-term investment cycles, energy companies face far-reaching decisions for establishing environmentally friendly, socially contributing and economically competitive energy infrastructure (Poisson-de Haro and Bitektine 2015; Steger 2004). Additionally, the competitive pressure increased to still moderate level after market liberalization for electric utilities, the unbundling of TSOs and consolidations in the O&G industry (Ströbele et al. 2010; Delmas et al. 2007b). Furthermore, substantial macro-economic changes are on-going, e.g., towards more decentralized electricity generation using more renewable and less fossil energy sources (IEA 2014) and towards digitalization (Schiwek 2015, 2016). Consequently, there is a need for adjusted business models fostering sustainability (Richter 2013; World Energy Council 2014). For example, O&G companies increasingly utilize natural gas being less harmful than oil, and indeed also renewable energy sources (Hubik 2017).

Based on this background, a systematic research review is seen as fruitful to synthesize existing knowledge and to derive gaps on how energy companies manage CS engagement and which performance impacts they obtain.

3.3 Methodology and review sample

I conducted a systematic research review and content analysis. This structured, replicable technique condenses content into a manageable number of categories (Bernard 2013; Stemler 2001). Therefore, systematic coding and documentation are crucial pre-requisites for high quality research reviews (Machi and McEvoy 2009; Bernard 2013). I applied pre-defined coding rules along a developed review framework to limit coding bias (Stemler 2001). Results were documented in a review matrix. Moreover, I aimed at uncovering all relevant sources using a scoping study, searching different databases and specialized journals, plus considering cross-references and recommended literature. The conducted review steps were as follows (see also appendix 1):

1. A scoping study with 23 sources helped refining review questions and developing a review framework with coding rules.
2. I searched for several keywords (see appendix 1) in three databases: Business Source Complete as mostly used database in past CS reviews, the interdisciplinary ISI Web of Knowledge, and ECONIS going beyond journals. This returned 3,941 sources.
3. 72 sources were added from specialized journals not being part of the three databases, namely Corporate Social Responsibility and Environmental Management; Journal of Management and Sustainability; Journal of Sustainability Science and Management; Critical Studies on Corporate Responsibility, Governance and Sustainability. This approach is in line with past CS research reviews (Montiel and Delgado-Ceballos 2014).

4. All these sources were filtered to eliminate duplicates and to ensure relevance based on titles and met selection criteria. As such, sources had to be published between 2000 and 2016. This period covers most energy-specific CS research after research calls (Allouche and Laroche 2005; Steger 2004) and ensures comparability. Publications before 2000 are expected to be influenced by changing business environments due to liberalizing electricity markets, e.g., in Europe since 1996 (Ströbele et al. 2010). Additionally, sources had to focus on the company level and be in English or German. I included sources from social sciences, esp. business administration and management. I excluded company publications like CS reports, journalistic essays or press releases. As a result, 199 sources were considered further. I screened abstracts to identify a pre-final sample of 66 sources.
5. Reading these sources and following expert recommendations led to seven added cross-references. Moreover, eight papers were eliminated.
6. 65 sources formed the final review sample whose content I analyzed using the defined coding scheme to answer review questions. Figure 2 provides descriptive information.

Most sources (57 sources, 88%) were journal articles, followed by five book chapters, two conference contributions and one dissertation. Articles were published in 35 different journals suggesting a diverse set of research perspectives. Most frequently, sources were found in 'Journal of Business Ethics' (7), 'Corporate Social Responsibility and Environmental Management' (6), 'Strategic Management Journal' (3), 'Business Strategy and the Environment' (3), and 'Journal of Cleaner Production' (3). The mix of highly ranked strategic and CSM as well as specialized journals shows a wide-reaching interest.

Overall, energy-specific CS research is on the rise with 51% of sources published since 2011; a trend also found in general CS research (Goyal et al. 2013; Lu et al. 2014).

For energy-specific findings, I will elaborate on covered industries, company sizes and regions. Firstly, O&G companies (35 sources) received highest attention, followed by electric utilities (22 sources). In contrast, reviewed sources scarcely examined TSOs (five sources based on same research project) and municipalities (two sources) that partly act as DSO (one source). Furthermore, samples spanning the entire energy sector were found (eight sources). Secondly, all empirical sources examined large companies with three exceptions considering mid-sized companies by convenience sampling (Ziegler et al. 2007; Salzmann 2006; del Mar Alonso-Almeida et al. 2014). No source focused on small- or mid-sized companies. Thirdly, many sources used global (25 sources), followed by North American (18 sources) and European samples (13 sources). This is not surprising, because Canada, the USA, and the EU imposed CS requirements early on (McWilliams et al. 2006). CS regulations have also been increasingly established in developing countries in Asia (Abro et al. 2016; Graafland and Zhang 2014), which is reflected in four sources covering this region. Moreover, reviewed sources covered three African countries, Australia and Brazil, too.

All in all, an overproportioned coverage of O&G and electric utility companies, large energy companies from industrialized countries and a potential over-emphasis of the environmental CS dimension constitute imbalances in existing research. Against this caveat, I present findings of this research review along the review questions.

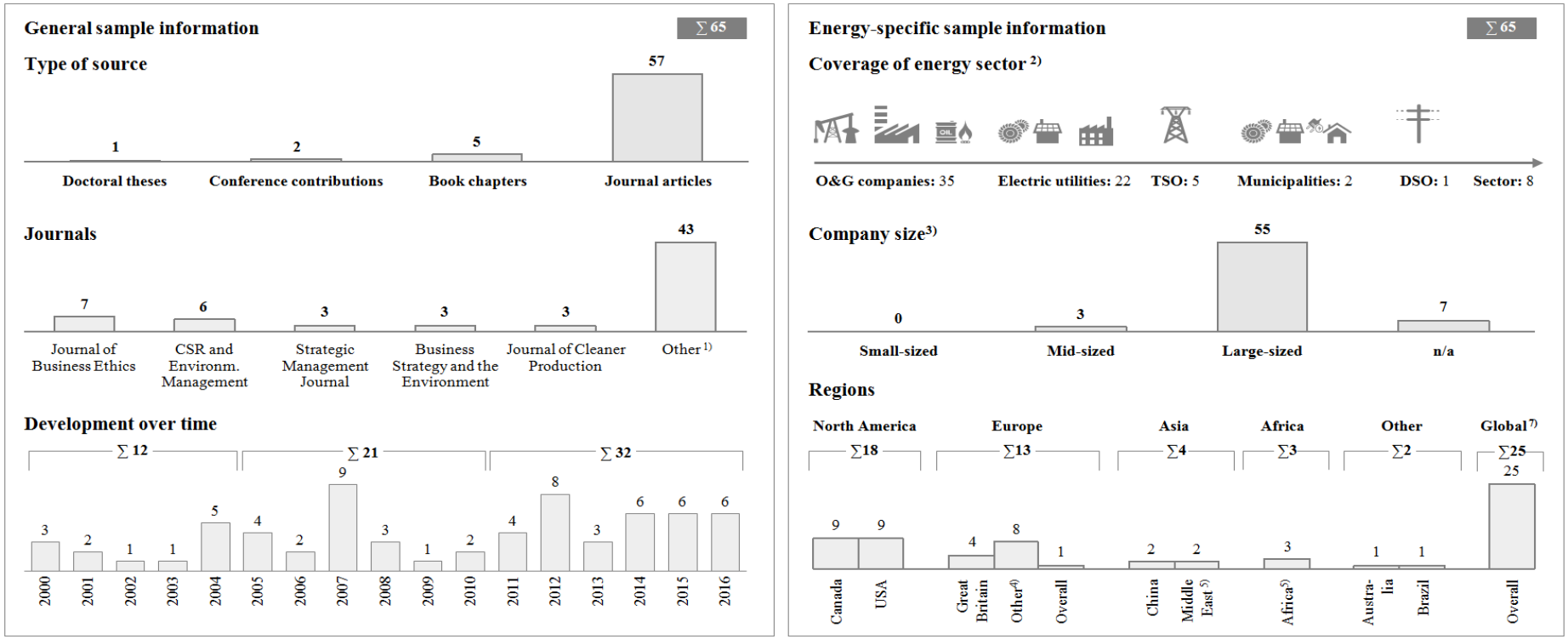

Figure 2: Descriptive information on review sample (own compilation; 1) journals with 1 or 2 publications; 2) Sum ≠ 65, because 7 sources address O&G companies and electric utilities / 1 source addresses municipalities and DSOs; 3) Based on information in reviewed sources, n/a for theoretical sources; 4) Czech Republic, Finland, Germany, Greece, Italy, Norway, Spain, Sweden; 5) Iran, Saudi Arabia; 6) Angola, Nigeria, Gulf of Guinea; 7) Including mixed regions)

3.4 Findings

This review aims at shedding light on CS engagement of energy companies by answering two review questions: i) How is CS engagement managed by energy companies, i.e., which CS areas matter and which CSM components are used?; ii) Which performance impacts can energy companies obtain from CS engagement, particularly on corporate sustainability performance (CSP) and corporate performance (CP)? Figure 3 depicts overall findings for these questions which I summarize here, before further insights for each review question are presented. Appendix 2 shows a list of all reviewed sources.

Firstly, more sources focused on i) CSM (46 sources) than ii) performance impacts (43 sources[8]). This is striking, because general research on CSM has only recently gained traction against the pre-dominant discussion of performance impacts (Wood 2010). In the reviewed energy-specific research, performance impacts have been studied in waves throughout the reviewed period. In contrast, a major and rising share of sources elaborating on CSM has been published since 2011 (20 sources). Additionally, sources addressing both questions faced their peak in mid-2000s. Thus, scholarly attention on CSM in energy companies has risen especially in recent years.

[8] Numbers include sources addressing both questions.

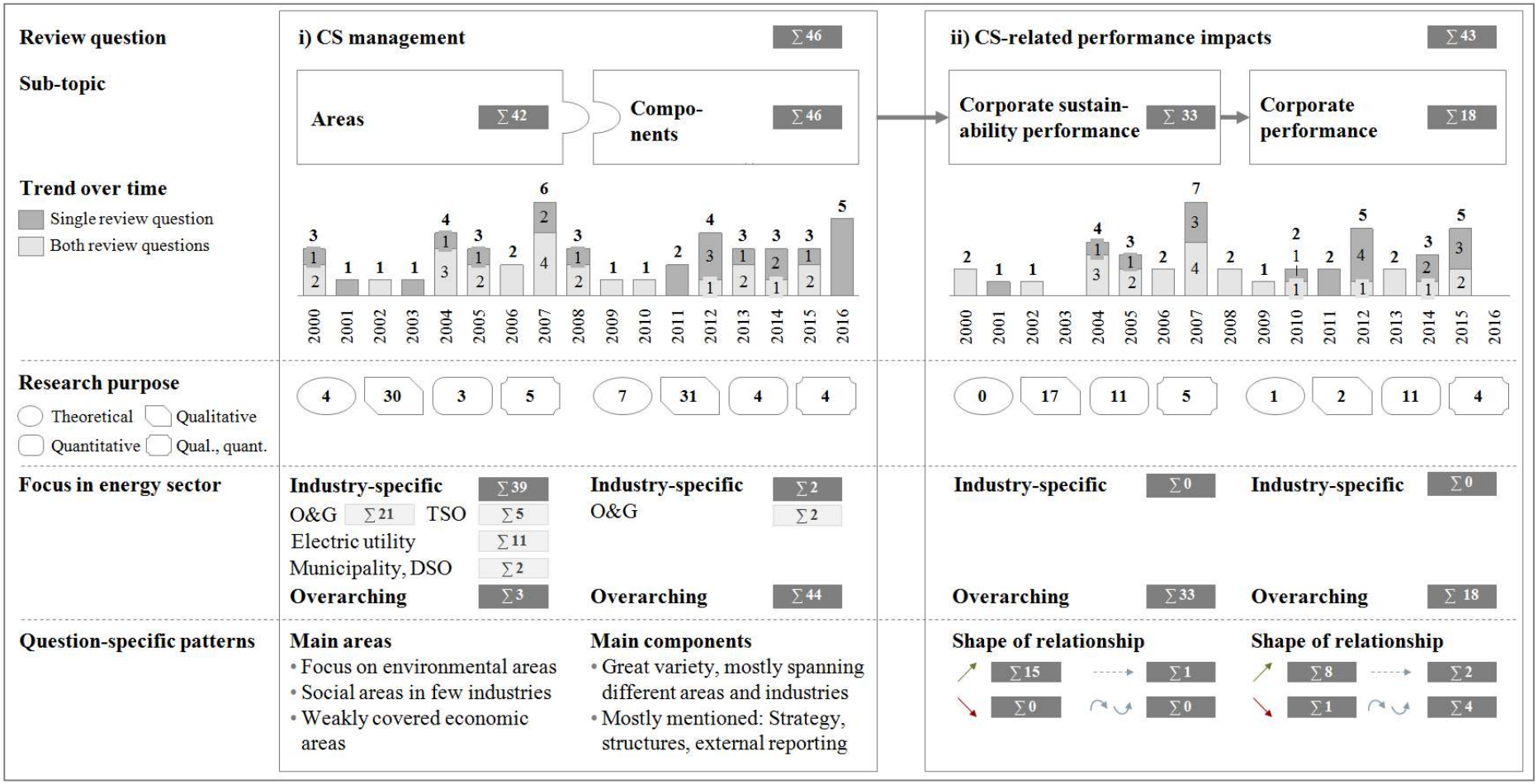

Figure 3: Overview of findings (own compilation; sum ≠ 65 as 24 sources address both review questions; For shape of relationship, only studies with quantitative and mixed (qualitative and quantitative) research purpose covered)

Secondly, reviewed research shows clear patterns in research methods and according purposes. Overall, research can be theoretical or empirical with the latter taking qualitative or quantitative approaches (Bernard 2013; Töpfer 2012). Theoretical research aims at explaining a phenomenon with its causes and effects like they occur in reality (Töpfer 2012). Qualitative empirical research is inductive by utilizing in-depth practice insights to derive theoretical advancements (Eisenhardt 1989). Quantitative empirical research is more deductive and aims at indirectly supporting or rejecting hypotheses which in turn also helps enhancing theories (Bernard 2013).

Before I present which research methods were used in the reviewed sources, I have to stress that 29 sources (45%) do not provide any theoretical background. However, theoretical backgrounds are necessary to substantiate arguments in both, theoretical and empirical research (Töpfer 2012; Bernard 2013). This marks a significant shortcoming in existing research.

Regarding CSM, the reviewed research comprised ~12% theoretical sources (4 on CS areas, 7 on CSM components, e.g., Kapstein and Wempe 2001; Yuan et al. 2011), ~70% qualitative empirical sources (30 on CS areas, 31 on CSM components, e.g., Kleb 2002; Metaxas and Tsavdaridou 2012), ~10% mixed empirical sources (5 on CS areas, 4 on CSM components, e.g., Salzmann 2006), and only ~8% quantitative empirical sources (3 on CS areas, 4 on CSM components, e.g., Sharma 2000). Thus, the vast majority of CSM-focused research aims at exploring CS areas and components used in practice in order to advance scholars' understanding and theories. The few mixed and quantitative empirical studies examine which company-internal and -external influences determine chosen CSM ambition levels. Thereby, they also serve exploratory purposes which underlines that CSM is not yet sufficiently understood.

Research on CSP impacts contains no source of theoretical type, 52% qualitative empirical sources (17 sources, e.g., Trapp 2012; Ortiz-de-Mandojana and Aragon-Correa 2015), 15% mixed empirical sources (5 sources, e.g., Mio 2010), and 33% quantitative empirical sources (11 sources, e.g., Stankova 2015; Hughey and Sulkowski 2012). Thus, it also remains exploratory with most qualitative empirical studies aiming at a more complete set of determinants for increased CSP. Testing the significant role of some of these determinants is the purpose of the quantitative and mixed empirical sources.

In contrast, research on CP impacts comprises mostly quantitative empirical studies with 61% (11 sources, e.g., Cai et al. 2012; Lee et al. 2011; Steger et al. 2007), 22% mixed empirical sources (4, e.g., Mio 2010), 11% qualitative empirical sources (2, e.g., Schaefer 2004), and only one theoretical source (6%, Glavas and Godwin 2013). Thus, this research field aims at verifying or rejecting hypothesized impacts from CS engagement on CP.

The third overall finding regards to the fact that energy-specific CS research shows a mismatch. 39 sources (93%) outline CS areas specifically for different energy industries. In contrast, only two sources (4%) mention industry-specific CSM components and none industry-specific drivers for performance impacts[9]. Instead, industry-overarching CSM components and drivers for performance impact are mostly found in reviewed sources.

These overarching findings shall be complemented with more granular results along the review questions.

[9] I use the terms intermediate outcomes and influences instead of mediating and moderating variables, because an evolving set of variables is used partly as mediators, moderators and partly as preceding influences to independent variables. A clear distinction remains as task at a more progressed research stage.

3.4.1 CSM

The need to properly manage CS engagement is paramount for energy companies (Scheunemann 2016; Klein and Prummer-Lehmair 2015) and has likely led to the recently increased research attention. Such research insights help us in understanding which CS areas are mostly addressed by energy companies and by which means. In general, scholars in CSM research commonly control for business sector / industry effects (Margolis et al. 2007; Carroll and Shabana 2010). This means that the here provided findings and priorities are specific for energy companies.

To shed further light on CSM, I summarize main theoretical backgrounds and their limitations, before I elaborate on CS areas, and CSM components and determinants of CSM. The findings on CS areas and CSM components are mainly based on the theoretical and qualitative empirical papers in reviewed research. For the determinants of CSM, I summarize the few quantitative and mixed empirical sources.

3.4.1.1 Theoretical background

Scholars draw upon several theoretical backgrounds to clarify CS areas which energy companies shall address in CSM. In contrast, CSM components and their choice widely lack theoretical basis.

For CS areas, the mostly utilized background (11 sources) is stakeholder theory (Freeman 1984). This is not surprising as demands for companies' rising stakeholder focus and sustainable business conduct evolved together (Bansal and Song 2017). Stakeholders are grouped on how they affect or may be affected by company's induced CS issues (Freeman 1984). On the one hand, there are company-external and -internal stakeholders. Many energy companies focused on external stakeholders initially and realized the relevance of internal stakeholders thereafter (Mirvis 2000). However, company-internal

stakeholders like employees and managers are also relevant, because they act as both, ambassadors for a company's CS engagement and as beneficiaries from it (Bolton et al. 2011). On the other hand, there are primary and secondary stakeholders. Primary stakeholders like shareholders, employees, customers, and governments are said to control resources relevant for a company's survival (Herbohn et al. 2014; Clarkson 1995). Secondary stakeholders like media or NGOs shape public opinion (Clarkson 1995). Stakeholder theory claims that stakeholders' expectations on environmental, social and economic effects of a single company constitute this company's relevant CS areas. Thus, CS areas are company-specific (Searcy et al. 2007; Poisson-de Haro and Bitektine 2015) and even site-specific with large deviations, e.g., between sites in developed and developing countries (Idemudia 2007). However, stakeholders may have different, partly overstated (Idemudia 2007; Matos and Silvestre 2013) and sometimes even conflicting expectations (Hahn et al. 2010). Thus, stakeholder theory demands companies to balance or even shape stakeholder expectations using CSM components (Vaaland and Heide 2008; Freeman 2005). Unfortunately, it offers only limited advice on how companies may do so (Lee 2008). In addition, stakeholder theory also lacks clear guidance on prioritizing CS areas which is a necessity as companies have limited capacity. Scholars recommend to prioritize CS areas that are relevant for primary stakeholders (Porter and Kramer 2006; Matos and Silvestre 2013). However, they often benefit from keeping the status quo instead of moving towards increased CS (Lee 2008). Furthermore, the natural environment can hardly voice its expectations. Nevertheless, an intact environment is decisive for any continued success of energy companies (Starik and Kanashiro 2013).

Partly mitigating shortcomings in stakeholder theory, two other theories are often utilized to understand CS areas.

Firstly, four sources rely on contingency theory (Thompson 1967)[10]. It claims that a company's core business and way of working form cornerstones, so-called contingencies that determine the priority of CS areas. A good example is found in the case study by Poisson-de Haro and Bitektine (2015): The most relevant CS area for one out of three investigated electric utilities was a rising share of renewable energy sources in its electricity generation. However, this area was less relevant for the other two companies that used to have a higher focus on renewable energy sources traditionally.

Secondly, two sources use institutional theory (Meyer and Rowan 1977; DiMaggio and Powell 1983). It stresses that not only the company but also its industry influences the relevance of CS areas. As such, there are commonly addressed areas like reducing greenhouse gas emissions in the O&G industry (Andreassen Saverud and Skjarseth 2007). An O&G company not addressing this area is said to face increased stakeholder expectations to comply with an 'informal industry standard' (Bansal 2005). This can turn a less relevant CS area from a company's perspective into a highly relevant one.

Looking at CSM components, the model by Wood (1991) used by one reviewed source offers the most explicit conceptual basis. It postulates that successful CSM requires principles (legitimacy, public responsibility, and managerial discretion), processes of responsiveness (assessment of business environment, stakeholder management, and issue management) and handling of outcomes (social impacts, social programs and policies). However, it has been criticized for being unspecific on components along its levels and for neglecting company-specific contexts (Salzmann 2006).

[10] Scholars continue to debate whether contingency theory is obsolete as theory or not. For example, Schoonhoven (1981) criticized lacking clarity in concepts and simplified relationships between structure, technology, and organizational effectiveness. Donaldson (2006) stresses that it institutional theory is better suited for explaining new organizational forms.

Additionally, scholars elaborating on CSM components use contingency theory (two sources) and institutional theory (three sources)[11]. For CSM components, contingency theory is insightful given the technical contingencies of a company. Companies tend to protect their contingencies and only change them slowly (Donaldson 2006). The more CS matches a company's contingencies, the more and the faster will CSM components be applied by the company (Poisson-de Haro and Bitektine 2015). Furthermore, CSM components being applied to core business practices can serve as sign for more advanced CSM than adding peripheral CS practices while conducting business as usual (Yuan et al. 2011). Yuan et al. (2011) utilize this core-periphery model to discuss different approaches to CSM that companies may take. This underlines that CSM occurs in different forms and evolves over time. Despite its valuable contributions, contingency theory offers only limited insights on choosing CSM components, and fosters small instead of radical changes (Lee 2008; Starik and Kanashiro 2013).

Institutional theory takes an outward perspective for the choice of CSM components. Isomorphism in this theory claims that best practices in CSM by few companies may become common practices in all companies in the industry (Raufflet et al. 2014). Critics stress arbitrary choices of best practices and their diffusion (Lee 2008). Thus, institutional theory also does not seem well suited for CSM.

Another theoretical background used in four sources examining the choice of CSM components is the resource-based view (RBV) (Barney 1991). Therein, companies benefit from resources and capabilities that are valuable, rare, inimitable and non-substitutable (VRIN) (Bansal 2005). Thus, CSM components are chosen that built VRIN resources and

[11] Scholars continue to debate whether contingency theory is obsolete as theory or not. For example, Schoonhoven (1981) criticized lacking clarity in concepts and simplified relationships between structure, technology, and organizational effectiveness. Donaldson (2006) stresses that it institutional theory is better suited for explaining new organizational forms.

capabilities like stakeholder integration capability (Ortiz-de-Mandojana and Aragon-Correa 2015). This way, CSM components shall be selected to yield a unique advantage for a company (Sharma 2000). Despite such contributions, scholars in general CS research raised doubt that companies engage in CS to reach VRIN resources and capabilities. For example, Glavas and Mish (2015) reveal that easy-to-imitate practices are fostered by CS leaders to enhance CSM in their industry overall. Other critiques stress that company resources and capabilities evolve slowly impeding any radical leap in CSM (Starik and Kanashiro 2013).

It becomes apparent that often used theoretical backgrounds face too many limitations to explain CSM components. It is worth noting that this is not an energy-specific research gap (Wood 2010; Lindgreen et al. 2012). For CS areas, the so far used theoretical backgrounds may at least explain a variety of CS areas to be addressed. Anyhow, they cannot explain their prioritization.

In the following, I summarize findings on CS areas in the reviewed research.

3.4.1.2 CS areas

A core concern of CSM is which areas shall be addressed within the social, environmental, and economic CS dimensions. Overall, environmental areas play the largest role (30 sources vs. 23 for social and 13 for economic areas). Of course, each company faces its particularly relevant CS areas (Porter and Kramer 2006). Given this fact, my review provides an overview of typically stated CS areas within the environmental, social and economic dimensions for companies in the different energy industries.

For O&G companies, environmental concerns result from the extraction, transportation, refining and also usage of fossil energy sources (Du and Vieira 2012). Thus,

up-, mid- and downstream activities may cause CS areas in the environmental dimension (Bansal 2005; Salzmann 2006). In particular, significant air emissions shall be reduced to counteract climate change (Salzmann 2006; Frynas 2005; García-Rodríguez et al. 2013; Tian and Slocum 2016). Oil spills or gas leaks shall be prevented, but they are hard to be fully avoided with every occurring incident causing damage on soil, water and biosphere like oil spills in the Gulf of Mexico (Mobus 2012), at Angolan (García-Rodríguez et al. 2013) or Nigerian sites (Frynas 2005; Idemudia 2007). Additionally, O&G operations cause landscape alterations (Frynas 2005; Valenti et al. 2014) or hazardous waste being hard to recycle or dispose in an environmentally-friendly way, esp. in developing countries (Frynas 2005; García-Rodríguez et al. 2013). Turning towards CS areas in the social dimension, O&G companies faced more severe issues traditionally than other energy industries (Steger 2004). Common expectations regard to health and safety of employees, because upstream activities at platforms as well as mid- and downstream acuities at pipelines and refinery facilities impose significant risks (Valenti et al. 2014; Hughey and Sulkowski 2012). Likewise, health and safety plays a role for customers (Abro et al. 2016), suppliers and communities close to operating sites of O&G companies (Raufflet et al. 2014). With O&G production being a temporary business in many locations, local communities also face initially increasing and later decreasing rates of employment, migration and rising food and rental prices (Frynas 2005). O&G companies being active in developing countries also have to watch out for human rights and anti-corruption being less strictly enforced (Salzmann 2006; Bolton et al. 2011). In these countries, local communities often expect a stronger contribution of large companies to local development (Idemudia 2007). However, the sole sponsoring of large, partly never completed projects like schools, roads or other favorite projects of governors has caused large criticism and even boycotts (Idemudia 2007; Frynas 2005). Looking at economic areas, O&G

companies' financial strength (Hughey and Sulkowski 2012) is important to meet the still high expectations on creating shareholder wealth (Bolton et al. 2011; Abro et al. 2016). Moreover, there is an increased need for competitiveness and efficiency (Bansal 2005), and stakeholders expect good corporate governance (Valenti et al. 2014; Du and Vieira 2012).

Turning towards electric utilities, CS areas depend largely on the mix of energy sources for electricity generation. Thus, I provide overarching CS areas for this industry, before I turn to particular ones for different energy sources. Reduction and prevention of greenhouse gas emissions to counteract climate change from the overriding CS area in the environmental dimension (Poisson-de Haro and Bitektine 2015; Salzmann 2006; Schaefer 2004; DeBono 2004). In addition, increased efficiency in generating and using electricity shall limit adverse environmental effects (Rogall et al. 2016). Many electric utilities also face expectations to increase the share of electricity generated from renewable energy sources (Salzmann 2006; Poisson-de Haro and Bitektine 2015). Ten sources mention the usage of renewable energy sources, but they do not shed light on potential adverse effects like landscape alterations. Rather, there seems to be a common belief that generating energy from renewable sources is sustainable per se – a belief likely fostered by comparisons to the tremendous adverse effects of non-renewable energy sources. Such adverse effects of fossil energy sources are widely discussed to foster a shift towards an increased share of renewable sources (e.g., Delmas et al. 2007b; Rogall et al. 2016; Poisson-de Haro and Bitektine 2015). Especially coal-based electricity generation faces high stakeholder expectations, because coal mines cause landscape alterations and soil or water pollution with heavy metals (Schaefer 2004; Salzmann 2006). In addition to these adverse environmental effects, it has comparably low efficiency for generating electricity (Ströbele et al. 2010). The environmental concerns for O&G-based electricity generation are similar with enlarged environmental risk from spills or leaks (Mobus 2012). Strikingly,

reviewed sources refer to nuclear energy as controversial, but they do not elaborate further on it (Delmas et al. 2007a; Salzmann 2006). This limited research coverage of nuclear energy sources stands in contrast to strong public debates (Flauger et al. 2011). A core reason seems to be that commonly used CS evaluations like the KLD index do not offer complete data for nuclear energy businesses (Kang 2013; MSCI 2016) or flag it in a negative screening like the oekom corporate rating (oekom 2016b). So, CS scholars simply lack data on nuclear energy.

Looking at social CS areas, electric utilities have traditionally seen them as less severe (Schaefer 2004; Salzmann 2006). Recently, employee health and safety (Bolton et al. 2011), diversity and personnel development (Rogall et al. 2016; Miras-Rodríguez et al. 2015) have gained attention. Another area regards to enforced sustainability in supply chains, esp. for fossil energy sources (Salzmann 2006). Furthermore, local community expectations need to be considered by electric utilities. They vary with, e.g., enhanced access to electricity in rural areas in developing countries (Matos and Silvestre 2013) or sponsoring of local culture or sport in many developed countries (Schaefer 2004). Such social areas imply a stable financial position of electric utilities at the economic dimension. This fact seems to be insufficiently stated in existing research. Often mentioned economic issues regard to customers' expectations of transparent pricing (DeBono 2004; Rogall et al. 2016), good corporate governance as well as shareholder wealth creation (Bolton et al. 2011).

For TSOs, the overhead or underground electricity grid lines form the basis for CS areas. Looking at the environment, the lines cause landscape alterations and require

managed vegetation for safety reasons (Searcy et al. 2007)[12]. These changes in vegetation often result in adverse effects on biodiversity which is particularly severe when it involves endangered species (Searcy et al. 2007). Other particular issues for TSOs are electric fields, noise and dust around grid lines (Searcy et al. 2007). Environmental areas are closely linked to some social ones, esp. involvement of local communities and environmental groups during the planning and constructing of new grid lines. In some regions, it may also be necessary to respect rights of aboriginal people (Searcy et al. 2007). Economically, TSOs are in particular expected to ensure a stable electricity supply (Searcy et al. 2007). This requires increased efficiency, high reliability and handling increasingly decentral electricity generation from renewable energy sources (Searcy et al. 2007; Rogall et al. 2016).

It is worth recalling that municipalities conduct business comparable to electric utilities and that they often act as DSOs being comparable to TSOs. Thus, the previously stated areas can be assumed to matter for municipalities, too. Additional areas result from their close connection to local communities. Thus, an increased awareness for municipality's impact on the natural environment is demanded (Perron et al. 2006). Socially, the role as a good citizen is crucial by providing local support via volunteering and / or sponsoring (Wagner and Hense 2016). For meeting these expectations, economic success of municipalities is important with prevailing pressures to enhance internal process efficiency and innovativeness (Wagner and Hense 2016).

All in all, these findings reveal a solid yet still to be improved understanding of particular CS areas which companies in different energy industries may face. Given these

[12] Five publications refer to the same research project as longitudinal case study Searcy et al. (2008a, 2009), Searcy et al. (2007, 2008b), Searcy (2005). By citing one publication here, I refer to the bundle of these sources.

insights, it is necessary to analyze which components energy companies utilize to address CS areas and enhance their CS engagement as such.

3.4.1.3 Components

Reviewed research contains a variety of components for managing CS in energy companies. 30 components were found as shown in appendix 3. Here, I will elaborate on the twelve most often mentioned components, starting from highest frequency.

A defined strategy for managing CS receives highest research attention (15 sources). It contains developed responses (Rogall et al. 2016) for addressing understood and prioritized CS areas (Idemudia 2007; Kleb 2002). Thus, a CS strategy roughly outlines actions needed to reach specific, CS-related goals in a certain time period (Mirvis 2000). The prominent role of a CS strategy reveals that energy companies leverage CS as a source for differentiation (Delmas et al. 2011), and at best integrate CS into their corporate strategy (Perceval 2003; Yuan et al. 2011; Scheunemann 2016).

Another component demanding integration regards to established structures and responsibilities (eleven sources). They are seen as crucial, because people being responsible and accountable are usually more likely to conduct assigned tasks (Salzmann 2006). However, it is important that CS-related responsibilities are not solely left with few units or even individuals in a company (Salzmann 2006). Instead, widespread CS-related structures and responsibilities are decisive (Mirvis 2000; Andreassen Saverud and Skjarseth 2007). Likewise, established senior CS champions or chief sustainability officers indicate commitment by top-management (Schaefer 2004; Yuan et al. 2011). Moreover, a coordinating unit helps instilling CS engagement throughout the company (Salzmann 2006; Abro et al. 2016).

As third CSM component, CS reporting (ten sources) mainly serves needs of company-external stakeholders. In the energy sector, CS reporting, at best in line with the Global Reporting Initiative's (GRI's) guidelines, has become common practice (del Mar Alonso-Almeida et al. 2014). Especially O&G and electric utility companies have utilized CS reporting early on in order to improve external recognition and stakeholder legitimation (Schaefer 2004; Valenti et al. 2014; Yuan et al. 2011). This fostered the development of special GRI supplements for these industries (GRI 2013a). However and unlike financial reporting, CS reporting is not yet mandatory in many countries and lacks common standards. Consequently, studies revealed low credibility of CS reports (Mobus 2012), as well as practices of 'greenwashing' (Scheunemann 2016). The main reasons for such results are seen in companies' discretion, overly positive reports on lighthouse projects, missing data over time and incomparable information across companies. This is particularly cumbersome for energy companies: Traditionally, many of them shared only few information and showed technology-oriented communication which manifested an external perception of less trustworthy CS engagement (Salzmann 2004). To counteract this perception, energy companies are recommended to report on CS holistically, transparently, and in a stakeholder-oriented manner (Scheunemann 2016).

Two other CSM components are closely connected to this recommendation, namely external communication (nine sources) and stakeholder management (nine sources).

External communication spans, e.g., CS campaigns to address particular issues (Trapp 2012), information on CSM, or achievements on corporate websites (Du and Vieira 2012). External communication shall enhance the flow of information. It is also used as tool to stress truthfulness on undertaken CS engagement, and to foster a mutual understanding,

e.g., on why some CS issues are prioritized over others (Poisson-de Haro and Bitektine 2015; Scheunemann 2016).

Furthermore, managing stakeholders is frequently mentioned. Scholars agree that successful stakeholder management means to firstly systematically identify stakeholder groups and interrelations to the particular company (Epstein and Widener 2011). Then, the stakeholder groups are prioritized (ibid.). Overall, stakeholder dialogues serve as widely applied tool to engage with stakeholders. Dialogues provide a platform either for consultation to obtain stakeholders' opinion on CS areas and initiatives, or for constructive feedback to continuously improve CSM (Kapstein and Wempe 2001). For being successful, dialogues shall be based on basic principles such as regularity and dedication to few CS areas, mutual respect, involvement of all affected stakeholders, transparency, reliance on facts and honesty, a balance of interests, and a granted chance for learning (Kapstein and Wempe 2001; Steger 2004).

Another frequently mentioned CSM component regards to undertaken environmental initiatives of energy companies. Environmental initiatives show what is really done and may aim at two purposes, namely controlling pollution (eight sources) or preventing it (nine sources). Pollution control aims at reduced environmental effects once they have occurred (Bansal 2005) and is often referred to as compliance-focused or reactive approach (Sharma 2000). Example initiatives are installation of filters to reduce air emissions (DeBono 2004) or cleaning contaminated water or soil (Valenti et al. 2014). In contrast, pollution prevention is seen as more proactive (Sharma 2000). For example, environmental risk assessments for new O&G production sites or pipelines may help avoiding environmental damage (Valenti et al. 2014). More innovative and efficient operating processes may also help reducing the need for materials and energy (Metaxas and

Tsavdaridou 2012). The success of environmental initiatives, esp. in developing countries, was found to increase when local conditions and possibilities are well-understood and gradually enhanced to reach international standards (García-Rodríguez et al. 2013; Abro et al. 2016).

All CS-related initiatives and actions are more likely to be executed successfully when clear plans are defined (Kapstein and Wempe 2001; García-Rodríguez et al. 2013). Thus, planning is another frequently mentioned CSM component (nine sources). In planning, strategic goals are broken down to operational targets, desired outcomes, needed activities, deadlines and responsible individuals or company units (Bolton et al. 2011; DeBono 2004). Plans are more accepted and implemented when the responsible person or unit has been involved in ambitious, yet realistic target setting and plan definition (Mirvis 2000).

Based on defined plans, the progress towards achieving those plans is tracked as CSM component (eight sources). Progress tracking is based on the premise that regularly measured and assessed target achievement fosters plan execution and allows corrective actions if necessary (Searcy 2005; Perceval 2003; Yuan et al. 2011). Without doubt, the objective of progress tracking is positive with achieving planned targets and enhancing decision-making (Epstein and Widener 2011; Mirvis 2000). However, conducting proper progress tracking for CS is cumbersome and requires continuous enhancement itself (García-Rodríguez et al. 2013). Thus, entire research projects focused on developing and enhancing progress tracking for energy companies (Searcy et al. 2007; Epstein and Widener 2011). Their work highlights that company- and CS area-specific key performance indicators (KPIs) need to be defined to best cover all targets without causing redundant monitoring. This requires an understanding of influences on these KPIs and

cause-effect relations among them. Other complications are impacts being intangible requiring often qualitative targets, or impacts occurring after time lags.

Due to these hardships in progress tracking, scholars increasingly stressed the relevance of corporate values or cultures (eight sources) in order to foster CS engagement throughout energy companies. CS-enforcing corporate values and cultures clarify preferred behavior by companies' managers or employees. This helps them to resolve dilemma situations caused by the three dimensions of CS and diverse stakeholder expectations (Kapstein and Wempe 2001; Kleb 2002). CS-enforcing values are often written in energy companies' code of conduct (Raufflet et al. 2014; Abro et al. 2016). However, CS-enforcing values need to be lived (Ketola 2008). A case in point is the oil spill in the Gulf of Mexico in 2010. Analyzing its causes, Mobus (2012) reveals a mismatch between communicated CS-related values of collaboration and safety vs. lived values demanding efficiency and short-time success. Consequently, companies that traditionally relied on CS-conflicting values and cultures have to engage in a consistent and company-wide change effort to not just define but eventually also live CS-enforcing values and cultures (Kapstein and Wempe 2001). Shell's transformation towards a more CS-enforcing culture in the late 1990s illustrates a successful culture change (Mirvis 2000).

The next CSM component is also important for reaching company-internal common understanding, namely internal communication. It is striking that only eight sources mention internal communication compared to eleven sources for CS reporting and nine sources for other external communication. This is likely linked to findings that energy companies focused CSM traditionally on external stakeholders (Bolton et al. 2011; Mirvis 2000). In any case, lacking company-internal communication impedes CS implementation (Slack et al. 2015). In contrast, well-conducted company-internal communication helps

obtaining employees' support for planned changes towards CS (Mirvis 2000). There are several ways to communicate internally like written updates from (top-)managers on CS strategies or achievements, reports based on tracked progress, or sessions for discussion (Bolton et al. 2011; Perceval 2003). Overall, regular, two-way communication and allowed constructive discourse are stressed as important success factors (Schaefer 2004).

Last but not least, initiatives to support local communities (eight sources) shall be presented here. Companies dedicate human and / or financial resources to enhance conditions for local communities (Wagner and Hense 2016; Valenti et al. 2014; Frynas 2005). These initiatives may have different purposes and forms given diverse local communities' expectations in different energy industries. Looking at municipalities, local entrepreneurs are often strengthened via sub-contracting, or local heritage is fostered by sponsoring (Wagner and Hense 2016). Sponsoring of events and projects receiving attention across regions seem to be the focus of electric utilities, TSOs and O&G companies (Metaxas and Tsavdaridou 2012; Searcy et al. 2007; Frynas 2005). In addition, these companies invest in enhancing energy access, basic health and schooling conditions in less developed areas (Abro et al. 2016; Valenti et al. 2014; Matos and Silvestre 2013). However, existing research suggests being cautious in case of sole financial support, esp. for communities in developing countries. As such, investments in governor's prestige projects may be seen as hidden corruption (Frynas 2005). To reach long-lasting impacts for local communities in developing countries, it is often better to involve community members and NGOs in initiatives (Matos and Silvestre 2013; Frynas 2005; Raufflet et al. 2014).

Of course, this list of CSM components is not comprehensive. Even the entire set of CSM components in appendix 3 is unlikely comprehensive given the limited review

sample as well as still immature research on CSM components. The immaturity is underlined by the few quantitative and mixed empirical sources testing CSM determinants.

3.4.1.4 Determinants of CSM

Only eight quantitative and mixed empirical sources examine cause-effect relations for CSM. I summarize mentioned variables from their research models in figure 4.

Scholars examine determinants at the individual, company and institutional level. The scarcely covered individual determinants regard to managers' perceived relevance of CS-related effects (Sharma 2000; Steger 2004; Salzmann 2006) and understood CS areas in order to be able to address them (Salzmann 2004).

In contrast, a more diverse set of company level determinants exists in reviewed research. As such, the degree of imposed risk for sustainability by a company's operations is found to drive CS engagement (ibid.). Furthermore, CSM seems to improve when a company is highly visible in public with according media attention (Steger et al. 2007; Bansal 2005). Likewise, CSM is found to enhance when the company depends on good reputation and a stakeholder-granted license to operate (Steger 2004; Salzmann 2006). Other company-related determinants for increased CS engagement are international experience in a company (Bansal 2005), a positive business case (Salzmann 2006; Graafland and Zhang 2014; Steger et al. 2007), recently good business results and a positive business outlook (Steger et al. 2007; Graafland and Zhang 2014) that often lead to high discretion of managers for CS engagement (Sharma 2000).

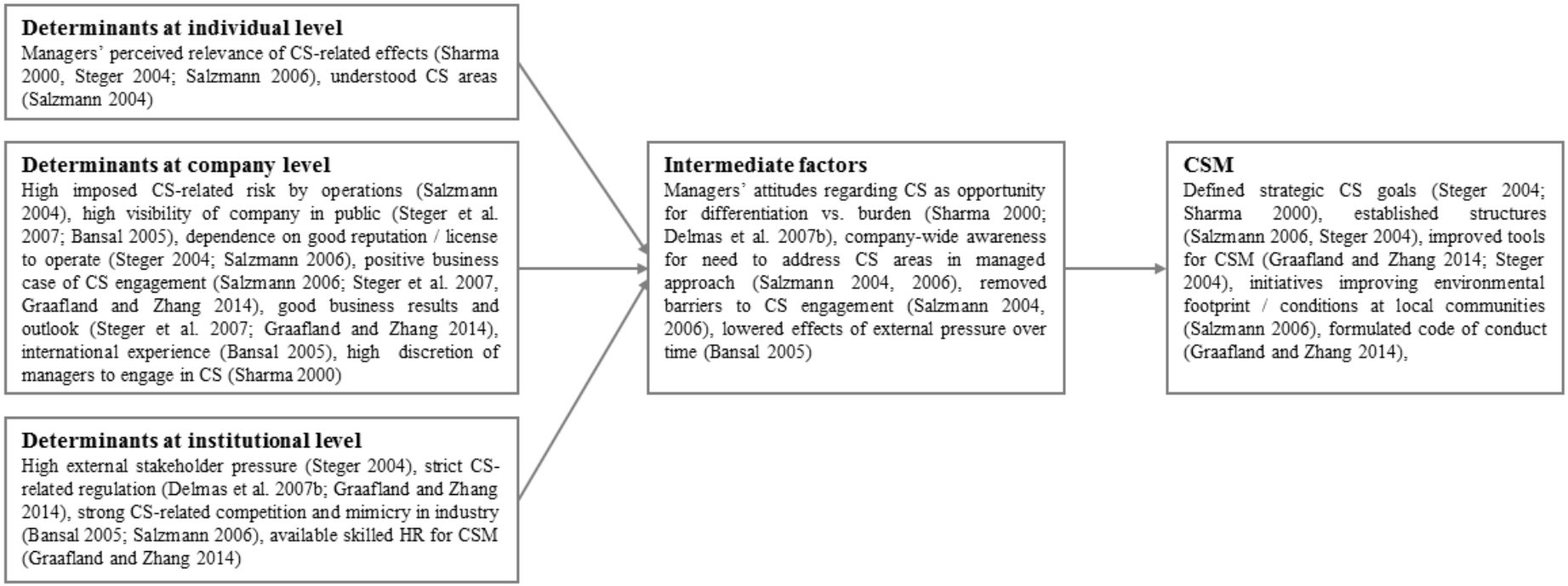

Figure 4: Overview of examined determinants of CSM (own compilation; major sources selected for each variable)

The institutional level mainly regards to company-external determinants of CSM with high external stakeholder pressure (Steger 2004), strict regulation (Delmas et al. 2007b; Graafland and Zhang 2014), and strong CS-related competition and mimicry in industry (Bansal 2005; Salzmann 2006). More recently, the availability of skilled HR for managing CS engagement has been stressed as driver, esp. in China (Graafland and Zhang 2014).

Together, these determinants lead to intermediate effects that shape a company's CSM approach. As such, managers may have different attitudes regarding CS engagement: When seeing it as opportunity for differentiation, and not as burden, CSM is more likely to be improved (Sharma 2000; Delmas et al. 2007b). Furthermore, company-wide awareness can be reached for the need to address CS areas in a managed approach (Salzmann 2004, 2006) and CS-related barriers can be removed (ibid.). Additionally, Bansal (2005) reveals that CSM is less likely to be improved due to external pressure over time underlining that these determinants are mainly at play in early phases of CS engagement.

Resulting from the different determinants and intermediate effects, enhanced CSM is shown in defined proactive strategic CS goals (Sharma 2000; Steger 2004), a formulated code of conduct (Graafland and Zhang 2014), established structures (Salzmann 2006; Steger 2004), and in improved tools, e.g., eco-efficiency analysis, CS benchmarking, monitoring tools (Steger 2004; Graafland and Zhang 2014). Furthermore, companies are found to engage in initiatives that improve their environmental footprint and / or conditions at local communities (Salzmann 2006).

Equipped with these findings on the first review question (i), the resulting performance impacts (research question ii) are analyzed.

3.4.2 Impact on performance

CS-related performance impacts have received significant attention in general and energy-specific research. There are two CS-related performance construct of main interest in previous research, CSP and CP.

So far, CSP is not commonly defined. In this paper, CSP shall be understood as the achieved level of sustainability (Lu et al. 2014; Carroll 1991). As example and not limited to this list, CSP is shown in achieved goals of a CS strategy (Valenti et al. 2014), implemented CS in a company (Carroll 1991) or addressed CS areas (Wood 2010).

CP is broadly defined as the degree to which a company achieves its goals formulated in its corporate strategy (Avram and Avasilcai 2014; Orlitzky et al. 2003). This comprises financial and non-financial performance (Salzmann 2006; Carroll and Shabana 2010; Bansal and Song 2017).

In this review, I present energy-specific findings for CS-related performance impacts, and put them into perspective with general CS research insights.[13] Particularly, I summarize the main theoretical backgrounds and their limitations, before I analyze impacts on CSP and eventually CP. Overall, there is agreement that performance impacts occur along several intermediate factors turning the relationships into indirect ones (Aguinis and Glavas 2012). Thus, I will elaborate on the shape of the relationships towards CSP and CP and present the intermediate effects and influences found in reviewed research.

3.4.2.1 Theoretical background

Overall, CSP is closely related to the success of CSM. Thus, it is easy to understand that the same backgrounds are used for explaining CSP impacts like for CSM. Firstly, the

[13] This review does not examine the 'virtuous cycle' of CS claiming that good past financial performance yields higher CSP which in turn improves financial performance Porter and Kramer (2002). This is seen as to simple and short-sighted given the diverse set of drivers of these relationships.

model by Wood (1991) roughly outlines which CSM components may lead to higher CSP (Salzmann 2006). Secondly, higher CSP shall result from achieved stakeholder legitimation thanks to addressed CS areas according to stakeholder theory (Stankova 2015). Thirdly, contingency theory claims higher CSP of companies having CS practices as part of their core rather than as peripheral practices (Yuan et al. 2011; Poisson-de Haro and Bitektine 2015). Fourthly, institutional theory argues for higher CSP when a company applies best-practice CSM components and addresses areas going beyond common ones in its industry (Parast and Adams 2012; Pacheco and Dean 2015; Bansal and Roth 2000).

Concerning the impacts of CSM on CP, three major lines of arguments with respective theoretical backgrounds exist in research. Firstly, the trade-off hypothesis based on shareholder theory (Friedman 1970) constitutes that addressing stakeholder expectations on CS areas dilutes managers' attention from increased shareholder wealth as single corporate responsibility. Simply put, investing in CSM is seen as less profitable than other investments which decreases CP (Perceval 2003; Steger et al. 2007; Pätäri et al. 2012). Another theory supporting this hypothesis is principal-agent theory. According to principal-agent theory, managers (agents) behave opportunistically and not in line with objectives of the owners (principals being shareholders in case of public companies). This assumption has been controversially discussed. In practice, owners have been found to pursue broader objectives (Pätäri et al. 2012) and a sole shareholder focus seems too shortsighted (Bolton et al. 2011; Perceval 2003).

In contrast and as second line of argument, there is the social impact hypothesis. The social impact hypothesis is based on stakeholder theory to argue for positive performance impacts resulting from often intangible enhanced stakeholder perceptions, trust, and loyalty (Lee et al. 2011; Delmas et al. 2007a). In the same vein, the RBV argues that CS-related

competitive advantages help increasing CP. For example, the capability to address stakeholder needs or to broaden CS-related organizational learning may increase the competitiveness of a company's portfolio and open new market opportunities (Pätäri et al. 2014). However, empirical support for such claims remains scarce (Kraaijenbrink et al. 2009). Furthermore, social identity theory supports positive CP impacts. Therein, employees perceive it as beneficial to be part of a company that is seen as sustainable (Glavas and Godwin 2013).

A third line of argument combines those theories for a positive and negative impact on CP in order to stress that it is NOT a linear relationship. However, scholars proposing a non-linear relationship do not yet agree on its shape. On the one hand, there may be the U-shaped relationship with high upfront costs of CS engagement before positive CP impacts can occur, e.g., with stakeholders taking time to value CS initiatives (Miras-Rodríguez et al. 2015). This line of argument follows the social impact hypothesis after overcoming trade-offs embedded in organizations with a stronger economic paradigm. On the other hand, scholars argue that CSM leads to quick wins with initially positive impacts on CP (social impact hypothesis), and that decreasing marginal returns occur after a certain point of reached CP (trade-off hypothesis). This results in an inverted U-shaped relationship (Steger 2004).

Such a variety in backgrounds explains continued debates on performance impacts. To capture current knowledge, I present findings from energy-specific empirical research.

3.4.2.2 Impacts on CSP

All sources taking a quantitative empirical research approach to examine the impacts on CSP show a positive, linear relationship between different independent variables and CSP as dependent variable (see figure 3 above). Only one source obtained insignificant

results (Ortiz-de-Mandojana and Aragon-Correa 2015). This is striking as newly investigated phenomena like CSP impacts of energy companies usually face inconclusive research results (Töpfer 2012). Reasons can be twofold: On the one hand, scholars may have focused on identifying a variety of potential determinants to be able to capture this construct. On the other hand, the overly positive existing research results may be caused by insufficient diversification, e.g., neglecting different shapes of the relationship. Both ways underline that research on CSP impacts is still in its beginnings.

To shed light on drivers of CSP impacts in energy companies, I summarize common variables in figure 5.

Independent variables found in reviewed research mainly are CSM components as presented in 3.4.1.3. As such, studies look at addressed stakeholder expectations on all three CS areas (e.g., Stankova 2015) by energy companies. In particular, scholars examined environmental initiatives to control or prevent pollution (e.g., Salzmann 2006), as well as initiatives enhancing conditions at local communities (e.g., Matos and Silvestre 2013). Other CSM components are defined strategic CS goals (Sharma 2000), CS reporting (Mio 2010), and progress tracking (Searcy et al. 2007; Epstein and Widener 2011).

Additionally, influences matter towards CSP. Such influences may occur at the individual, company, or institutional level. As individuals, managers' high intrinsic ethical responsibility results in higher CSP (Bansal and Roth 2000). Positive influences for CSP at company level are, e.g., more available resources and offered discretion to managers for instilling CSM in energy companies (Salzmann 2006). Similarly, energy companies showing high CS-related competitiveness achieve higher CSP (Bansal and Roth 2000). Turning towards institutional influences, it has been found that CSP rises as result of enhanced CSM by energy companies – for two reasons: external pressure due to social

movement activities (Pacheco and Dean 2015), or strong competition in CS engagement in an energy industry (Salzmann 2006).

Intermediate effects between independent variables and CSP are mainly available in qualitative studies in my review. Intermediate effects are often intangible assets which are hard to capture in quantitative measurements. For example, revealed intermediate effects are a common CS understanding (Schaefer 2004), increased CS awareness of internal stakeholders (Salzmann 2006; Steger 2004), or more collaborative stakeholder relations (Kleb 2002). All such intangible assets matter for energy companies, esp. when their traditional way of doing business has not been CS-centric. Moreover, CS engagement leads to enhanced decision-making (Epstein and Widener 2011), and organizational learning combined with continuous improvements (Searcy et al. 2007; Parast and Adams 2012) as intermediate effects leading to larger CSP. A higher ownership to foster CS engagement as intermediate effect was also found to increase CSP (Schaefer 2004; Steger et al. 2007).

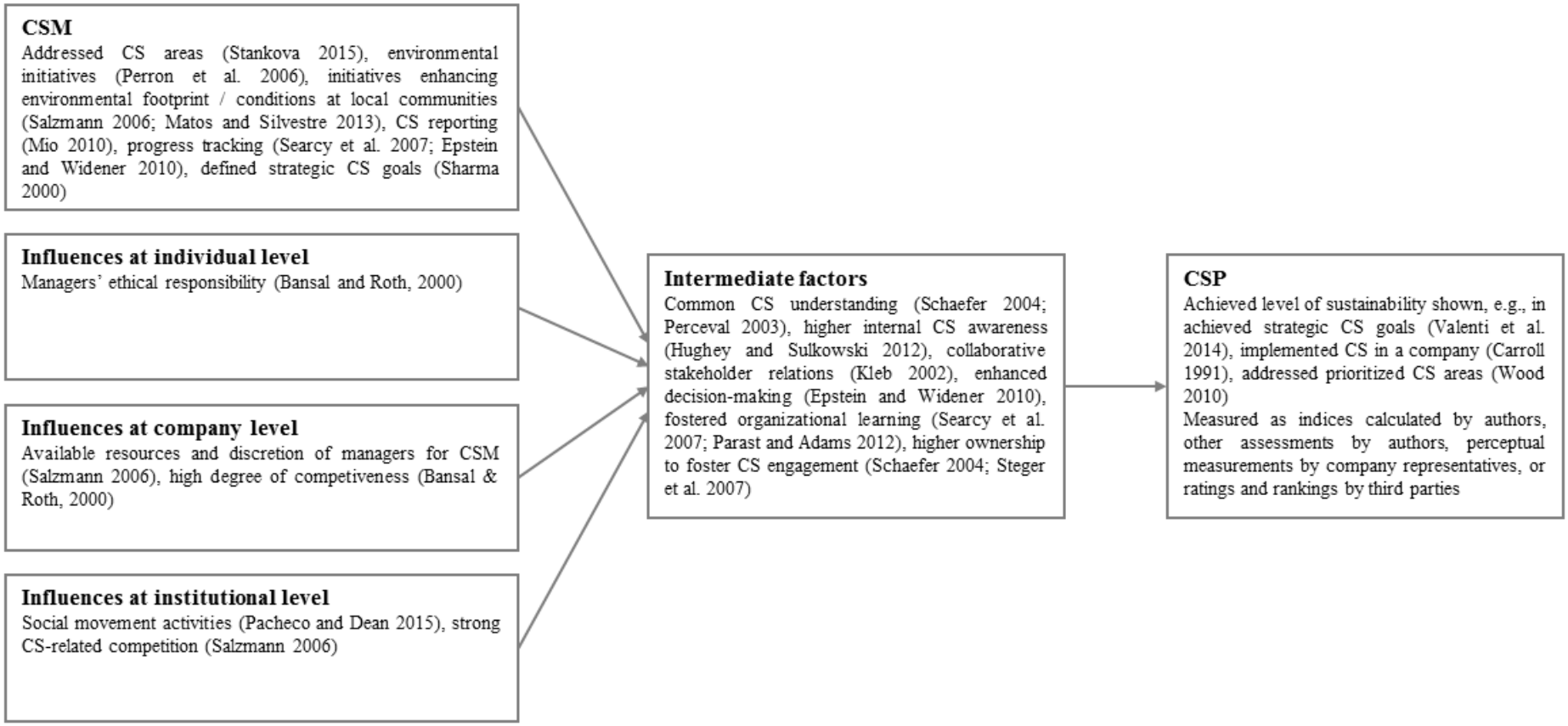

Figure 5: Overview of examined variables for CSP impacts (own compilation; major sources selected for each variable)

Following these intermediate effects, CSP forms the dependent variable in this relationship. In line with general CS research (van Beurden and Gössling 2008; Peloza 2009), I find CSP measurements as cause for concern. Ideally, CSP would be measured objectively, validly, reliably and in a widely applied manner to ease comparisons of results (Wood 2010). However, this ideal state is not yet achieved for several reasons: Only one CSP measurement occurs twice in the reviewed sources; all other measurements are used only once, underlining the diversity of CSP measurements. Furthermore, CSP measurements vary: CSP is measured in indices, as assessments by authors, perceptual measurements, or ratings and rankings. Indices calculated by authors cover various, not commonly defined KPIs (seven sources, e.g., Krajnc and Glavič 2005). Authors' assessments mostly regard to the quality of CS reporting (three sources, e.g., Herbohn et al. 2014). Both measurement mechanisms constructed by authors have been criticized for being less objective (Wood 2010). Perceptual measurements use company representatives' subjective evaluation of CSP (eight sources, e.g., Parast and Adams 2012). The ratings and rankings by third parties span, e.g., the KLD index, Dow Jones Sustainability Index, Asset4, or Pacific Sustainability Index (eight sources, e.g., Pätäri et al. 2014). The KLD index is the CSP measurement used twice in reviewed sources. Ratings and rankings differ in their methodology and were criticized for being partly intransparent and overly dependent on company-provided data (Windolph 2011), for yielding diverging results (Chatterji et al. 2016) or even systematic measurement errors (Carroll et al. 2016). Such critiques underline that using CS ratings or rankings in research studies requires careful selection and thoughtful interpretation of results. Regardless, many ratings or rankings have improved their methodologies regarding validity and reliability (Sadowski 2013) and are said to allow for more objective and comparable research results (Wood 2010). This has led to a recent increase in reviewed studies relying on third party ratings and rankings.

Knowing that CSP measurements differ greatly, achieved CSP results are influenced by the fact that I look at the energy sector (Herbohn et al. 2014; Ziegler et al. 2007), and therein at different energy industries. In particular, reviewed research elaborated on CSP of O&G companies and electric utilities. O&G companies face relatively low CSP underlining its controversial status (Lee et al. 2011; Bansal 2005). Electric utilities used to achieve even lower levels of CSP than O&G companies (Salzmann 2006), which has improved to medium CSP evaluations (Mio 2010). This was likely also driven by an overall larger share of electricity generation from renewable energy sources (Delmas et al. 2007b; Pacheco and Dean 2015).

All in all, CSM and other drivers likely have positive impacts on CSP despite a rather immature research status and CSP measurement concerns. As mentioned previously, CSP serves as common starting point for studies examining the impacts on CP.

3.4.2.3 Impacts on CP

Looking at the shape of the relationship between CSP and CP (see figure 3 on page 61), results support an overall positive impact (eight sources, e.g., Lee et al. 2011). However, studies also revealed insignificant (Parast and Adams 2012; Ziegler et al. 2007) or negative impacts (Filbeck and Gorman 2004). Additionally, non-linear shapes were examined with an inverse U-shape (three sources, e.g., Steger et al. 2007) and normal U-shape (Miras-Rodríguez et al. 2015). Thus, this relationship has been researched in a more diversified manner than CSP impacts in the reviewed studies. Regardless, puzzles remain, esp. on influences and intermediate effects (Ekatah et al. 2011; Pätäri et al. 2012).

To capture current knowledge, I provide already covered variables in figure 6 on the next page.

Looking at the influences, I see the narrow vs. broad view on CP as dependent variable as main influence. The scope of considered impacts differs between the narrow and broad view on CP. The widely taken narrow view in 15 sources treats CP as financial performance only. In contrast, the broad view found in three sources considers financial, social and environmental developments (Salzmann 2006; Searcy et al. 2008a), as well as company-internal improvements to reach overall strategic goals (Parast and Adams 2012).

Other influences can again be grouped to individual, company and institutional level. Examples are higher commitment by top-managers in energy companies (Schaefer 2004; Parast and Adams 2012), and their morality (Cai et al. 2012) resulting in larger CP impacts. This is explained by the enlarged focus on CS engagement being more trustworthy and stronger valued by external stakeholders. Likewise, stakeholder's own values (Glavas and Godwin 2013) influence the achieved CP. At company level, a proactive, innovative mindset regarding CS is seen as influence (Steger 2004; Kiernan 2001). The institutional level also influences the relationship towards CP. As such, customers can show a varying average willingness to pay for green or fair trade products (Salzmann 2006) which impacts the performance of an energy company. Moreover, regulations may tighten the room for differentiation of energy companies which also influences their CP (Filbeck and Gorman 2004).

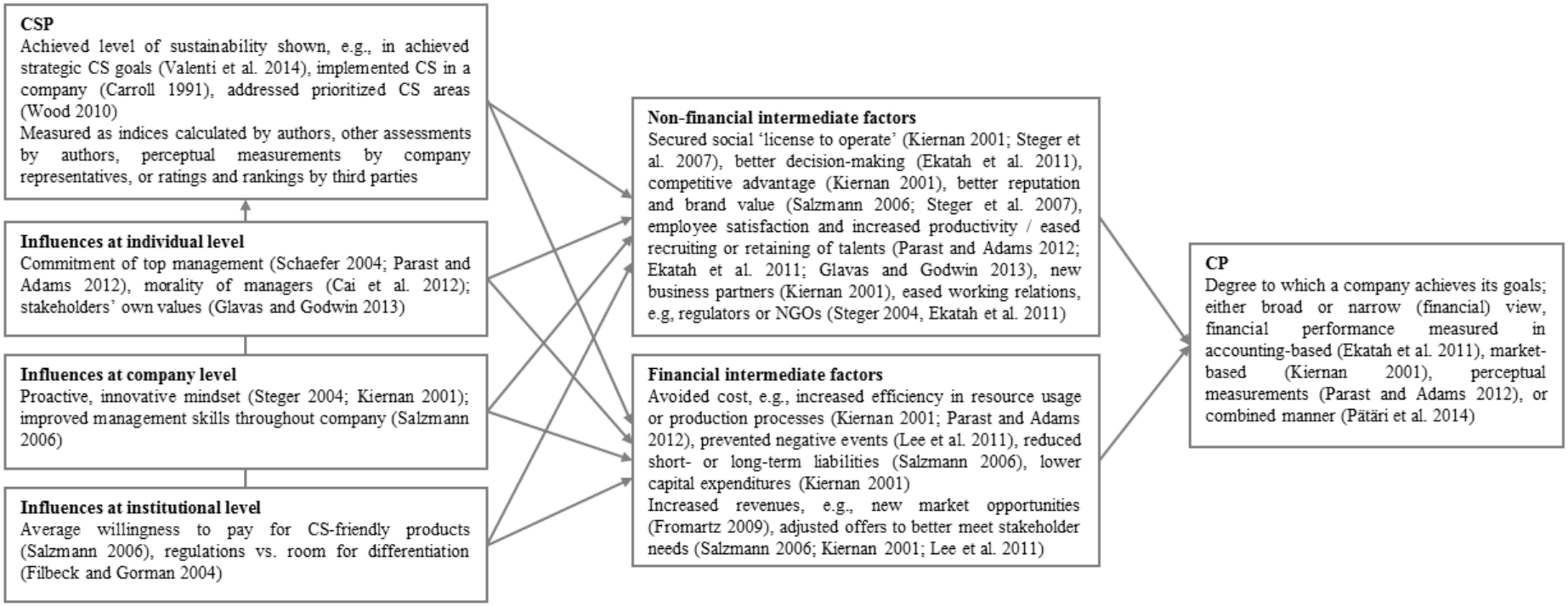

Figure 6: Overview of examined variables for CP impacts (own compilation; major sources selected for each variable)

Unfortunately, methodological influences exist, too. They regard to CP measurements, also in combination with CSP measurements. Not only does the already mentioned narrow vs. broad view influence CP impacts (Carroll and Shabana 2010), but also the way of measuring financial performance in the narrow view. To assess financial performance, scholars have used accounting-based (e.g., return on assets, see Ekatah et al. 2011), market-based (e.g., share price developments, see Kiernan 2001) and perceptual measurements (Parast and Adams 2012), as well as combinations (Pätäri et al. 2014). Given the small sub-sample of 18 sources measuring CSP and CP in combination, no patterns for such methodological influences are derived.

Looking at intermediate effects between CSP and CP, one needs to distinguish between financial and non-financial intermediate effects:

Traditionally, energy companies seemed to focus on financial outcomes, esp. in form of avoided costs (Steger 2004; Salzmann 2006). Therein, operational cost savings due to increased efficiency in resource usage or production processes are frequently mentioned (Kiernan 2001; Parast and Adams 2012). Furthermore, prevented negative events like oil spills help saving money (Lee et al. 2011). Likewise, energy companies benefit from reduced short- or long-term liabilities (Salzmann 2006), and reduced capital expenditures (Kiernan 2001) due to better managed stakeholder relations. Looking at revenues, energy companies being considered as CSM pioneers are increasingly able to develop revenue opportunities (Fromartz 2009). For example, adjusted existing offers as well as innovative new offers are used to better meet stakeholder needs for increasing revenues (Salzmann 2006; Kiernan 2001; Lee et al. 2011). Unfortunately, existing research does not shed light on which CS-enhanced offers per energy industry lead to revenue increases.

Non-financial intermediate effects are especially recognized by CS-leading companies (Steger 2004). There are company- and stakeholder-related non-financial outcomes. One major company-related outcome is a secured social license to operate (Kiernan 2001; Steger et al. 2007). This social license to operate is of relevance for energy companies that depend on acceptance and access to energy sources. Moreover, energy companies benefit from better decision making (Ekatah et al. 2011), and competitive advantages (Kiernan 2001). Likewise, improved customer reputation or brand values are stressed (Salzmann 2006; Steger et al. 2007). The stakeholder-related intermediate effects were traditionally less considered by energy companies (Steger 2004). However, more recent studies reveal an increasing awareness of positive effects from higher employee satisfaction, their rising motivation and productivity as well as eased recruiting or retaining of talents (Parast and Adams 2012; Ekatah et al. 2011; Glavas and Godwin 2013). Furthermore, studies reveal positive CP impacts from increased customer loyalty (Parast and Adams 2012), won new business partners (Kiernan 2001), more satisfied shareholders (Salzmann 2004), and generally eased working relations with stakeholders like regulators or NGOs (Steger 2004; Ekatah et al. 2011).

All in all, the so-called business case of CS engagement is supported for energy companies. The reviewed research contains a variety of intermediate effects and additional influences which seem to play a role for still weakly examined non-linear shapes of this relationship.

3.5 Discussion

In this paper, I have synthesized research between 2000 and 2016 on CSM and resulting performance impacts from the perspective of energy companies. Findings reveal specific CS areas to focus on per energy industry. Consequently, CS engagement has to be

industry-, even company-specific. Moreover, this reviews showed that energy companies across different industries utilize a similar set of still weakly understood CSM components, likely due to a still early CSM research stage. Furthermore, the reviewed studies revealed positive, indirect impacts of CS engagement on CSP and CP. Overall, further research on CSM components and CS-related performance impacts seems necessary.

In order to outline more precise, promising paths for future research, I discuss findings and highlight gaps beforehand.

Most of our existing knowledge about energy companies' CS engagement is highly fragmented which restricts research progress. For example, 57 of the 65 reviewed sources, so 88%, are published in 35 journals with a maximum amount of seven papers per journal.

Furthermore, this fragmentation is intensified by multiple theoretical backgrounds: There are opposing theoretical arguments regarding CP impacts with a trade-off hypothesis (shareholder theory, principal-agent theory) and a social impact hypothesis (stakeholder theory, social identity theory, RBV). In contrast, impacts on CSP are examined using complementary backgrounds like stakeholder, contingency, and institutional theory. These theories are also among the most commonly used theories for CSM. However, they cannot explain all shapes of CSP impacts and lack guidance for choosing relevant CS areas and CSM components. Thus, I follow past research and emphasize the need for a broadened theoretical basis that is able to capture the broad, complex, multi-dimensional constructs of CS, its management and impacts comprehensively (Wood 2010; Starik and Kanashiro 2013; Montiel and Delgado-Ceballos 2014).

Another striking finding is that 45% of the reviewed sources do not provide any theoretical background at all. Future research needs to overcome this shortcoming.

Looking at CSM in more depth, the still exploratory research stage on determinants of CS engagement is recommended to be advanced. Fully captured drivers of varying degrees of CS engagement would enlarge our understanding on CSM overall.

Additionally, the reviewed CSM research elaborates extensively on distinct CS areas to be addressed by companies in different energy industries. Overall, energy companies face strongest pressure to address CS areas in the environmental dimension. Apparent reasons for that are high environmental risks caused by energy companies' operations (Salzmann 2006; Rogall et al. 2016) and past negative events (Mobus 2012). In contrast, economic responsibilities of energy companies are only weakly covered and show great variety like stable energy supplies, sponsoring, or good governance. Reviewing existing research raises the impression that scholars assume energy companies to be highly profitable and to have well-established business models. However, many business conditions have changed (Mirvis 2000; Ströbele et al. 2010) and CS research should better reflect challenges at economic areas. Last but not least, CS areas in the social dimension have played a relevant role for O&G companies and municipalities only. Thus, deepening our understanding on social responsibilities in other energy industries seems worthwhile, too.

Additionally, the reviewed sources yield a potpourri of CS areas without any perceivable structure. For example, O&G companies face issues in disposing hazardous waste (Frynas 2005; García-Rodríguez et al. 2013) – a CS area one can easily expect to also matter for electric utilities, esp. with coal- or nuclear-based electricity generation. However, reviewed sources do not include such claims. Moreover, environmental pollutants have been discussed as adverse effect on the natural environment (e.g., García-Rodríguez et al. 2013) and on local communities (e.g., Frynas 2005). Such overlaps

remain unresolved in existing research to the best knowledge of the author. Consequently, a structure of CS areas going beyond the abstract social, environmental, economic dimensions seems necessary to facilitate a common understanding and thus, advanced CSM in research and practice.

In addition, reviewed CSM research shows a mismatch between specific CS areas for energy industries and almost entirely industry-overarching CSM components. One possible reason may be that addressing specific CS areas of energy industries requires not only tailored but also overarching CSM components. In that case, at least some tailored components should have been found. Therefore, it seems more plausible that research is not yet as progressed on CSM components as on CS areas. Thus, this review reinforces the call for extended research on CSM components to better guide energy companies in successfully engaging in CS (Lindgreen et al. 2009b).

The CSM components mentioned in past research also underline that CS is of strategic relevance for energy companies (Delmas et al. 2007b; Rogall et al. 2016). However, they also show an external focus with primarily managed external stakeholders' expectations (Bolton et al. 2011), CS reporting and external communication (Poisson-de Haro and Bitektine 2015; Mio 2010). This imbalance likely evoked impressions that CS engagement serves as self-marketing tool for energy companies (Scheunemann 2016) and impeded company-internal motivation to foster CS engagement (Slack et al. 2015). Consequently, future research may guide practitioners better in balancing internally- and externally-focused CS engagement.

Another gap regarding CSM components is the lack of a clear structure or order among them. The frequently mentioned CS components used by energy companies seem to either a) clarify objectives and expected behavior (e.g., strategies, values), b) specify what

to engage in and how (e.g., plans, structures), and c) reflect what is done (e.g., initiatives, progress tracking). Thus, a certain classification of CSM components is implied in existing research. Structuring CSM components is a relevant effort, also because existing CSM frameworks (e.g., Maon et al. 2009) put only selected components into an order like a CS strategy, derived plans and according communication. Despite their lacking comprehensiveness criticized in past research (Starik and Kanashiro 2013), such frameworks imply that CSM components are interdependent. Consequently, any framework for CSM components shall offer a comprehensive structure that also captures interdependencies.

Such a CSM framework would also help advancing our understanding of drivers for performance impacts. This review shows that many CSM components contribute to increased CSP like CS-enforcing values (Kleb 2002) and initiatives targeting pollution control (Perron et al. 2006) or local community issues (Salzmann 2006). However, not all mentioned components have been examined for their CSP impacts constituting opportunities for future studies.

Another promising research path regards to the shape of the relationship towards CSP: Previous empirical studies comprise only positive, linear shapes. More so, the focus on a positive, linear shape is also found in general CS research (e.g., Kang 2013; Attig and Cleary 2015). Therefore, scholars are encouraged to examine also negative or non-linear shapes of this relationship. This would also set research results on more solid ground, once a dominant shape is found across studies examining different options.

Concerning the impacts on CP, findings in this review support an indirect relationship, which is also found in general CS research (Aguinis and Glavas 2012; Carroll and Shabana 2010). Despite a large general CS research body on CP impacts, additional energy-specific

studies are encouraged to extend the list of identified financial and non-financial intermediate effects, e.g., regarding additional revenue potential or employees' organizational pride. Furthermore, empirical evidence is needed, esp. for non-linear shapes of this relationship.

Regardless of examining CSP or CP impacts, a better understanding of influences at individual, corporate and institutional level seems worthwhile.

Moreover, we still face a challenge in measuring CSP and CP. A core concern is the great variety of applied CSP measurements limiting the comparability of studies' results (van Beurden and Gössling 2008). In the short run, scholars are recommended to carefully select existing measurements which all have their strengths and weaknesses (Peloza 2009). In the long run, a common set of valid, reliable CSP measurements deems necessary. Regarding CP, the predominant narrow view on financial aspects needs to be reduced. As CS postulates a holistic view on social, environmental, and economic aspects, CP measurements need to take a broad view, too (Carroll and Shabana 2010).

The reviewed research also shows a concentration on few energy industries, energy sources and company characteristics. Consequently, intensified research is recommended on still weakly covered energy industries, being TSOs, municipalities, and DSOs. Likewise, research on CS areas, utilized CSM components and achieved impacts by energy companies utilizing nuclear energy sources would close a relevant gap. Furthermore, a more objective assessment of renewable energy sources seems necessary as they also have their shortcomings regarding sustainability. Additionally, the gaps on small- and mid-sized energy companies and those active in developing countries are encouraged to be closed.

Last but not least, practitioners gain further insights on CSM based on my research review. They receive support for strategically engaging in CS as it yields positive performance impacts for both, CSP and CP. More so, performance impacts coincide with often hard-to-quantify, yet valuable intermediate effects like enhanced stakeholder relations, increased company-internal cooperation and ownership to reach changes, or innovative, learning-oriented mindsets to stay competitive. In order to reach such outcomes and resulting performance impacts, practitioners need to manage CS engagement comprehensively. For this purpose, energy companies' managers and employees alike may refer to the provided typically relevant CS areas for their specific industry to reflect which areas they already address well or need to address better. Overall, social responsibilities should not be neglected against the increasingly regulated environmental and the traditionally focal economic dimension.

Additionally, a set of CSM components shall be utilized for addressing CS areas and enhancing CS engagement. This review provides a list of CSM components used by energy companies. Practitioners may review them and decide which ones they already apply or should utilize more in future. Such CSM components span, e.g., lived CS-enforcing values, CS strategies, clear and wide-reaching CS responsibilities, initiatives, as well as company-internal and -external communication. Regarding the latter, energy companies are well-advised to pay larger attention on internal stakeholders in order to enhance both, company-internal support and -external perception of truthful rather than marketing-driven CS engagement.

3.6 Conclusion

This paper contributes to an advanced understanding of CSM and resulting performance impacts from the perspective of energy companies by systematically reviewing 65 sources published between 2000 and 2016. The findings of this review do not only offer guidance for practitioners but also help highlighting paths for future research to close current research gaps.

Findings reveal typically relevant CS areas for companies in different energy industries, in contrast to overarching, not industry-specific CSM components. Both, CS areas and CSM components demand a clearer structure for future research progress. Additionally, the need for a broadened theoretical background is emphasized that is able to comprehensively capture the complex, multidimensional constructs CS, its management and impacts. Furthermore, the findings underpin that energy companies achieve overall positive impacts from CS engagement on CSP and CP. Being indirect relationships, performance impacts involve mostly intangible intermediate effects towards CSP (non-)financial outcomes towards CP. The outcomes are influenced by factors at individual, company and institutional level, as well as by measurement issues that require increased scholarly attention. Moreover, impacts on CSP and CP for energy companies need to be further examined regarding the shape of these relationships.

All in all, this first energy-specific CS research review responds to calls for more sector-specific insights (Peloza 2009; van Beurden and Gössling 2008) and enhanced guidance on CSM for practitioners (Lindgreen et al. 2009b) based on synthesized current knowledge and outlined future research opportunities. It reinforces the relevance of profound and successful CS engagement by energy companies.

4 Managing corporate sustainability as a system: The road for successful implementation

by Stefanie Priemer

Abstract

This paper introduces an advanced, comprehensive framework for corporate sustainability management (CSM) in order to implement corporate sustainability (CS) as basis for reaching desired performance impacts. A review of CSM research helps deriving requirements for such an advanced framework. Thus, it is suggested to manage CS as system which meets these requirements. The CS system framework draws upon general systems theory, especially human resource (HR) systems, and is refined using findings from a qualitative study. The CS system framework highlights CS areas and structures CSM components according to their purpose along four levels out of which companies shall choose those being relevant for them. Moreover, the role of fit in CSM is elaborated. All in all, the CS system framework yields relevant implications for both, practitioners and scholars.

4.1 Introduction

The overall positive impact of corporate sustainability (CS) engagement on company's performance has received extensive research attention as shown in numerous research reviews and meta-analyses (e.g., Carroll and Shabana 2010; Margolis et al. 2007; Orlitzky et al. 2003). Such desired impacts are increasingly claimed to be achieved by companies that manage their engagement to really implement CS (Lindgreen et al. 2009b; Mosher and Smith 2015; Poisson-de Haro and Bitektine 2015). So, it is not surprising that top-managers stress CS management (CSM) as one of their top three priorities (Bonini and Bové 2014; Snowden and Cheah 2015). However, research offers only selected insights on how CS shall be managed to implement it as basis for performance impacts (chapter 3 of dissertation; Lindgreen et al. 2009b; Starik and Kanashiro 2013). This paper addresses this gap.

Hereafter, CS is understood as a company's voluntary addressing of its induced, stakeholder-related effects on economic, social and environmental dimensions along this company's value chain in the short and long run (Elkington 1994; Dahlsrud 2008; Porter and Kramer 2006; Montiel and Delgado-Ceballos 2014). In contrast, research still lacks a clear understanding on what implemented CS means. Here, I combine the approaches by Buller and McEvoy (2016) and Noble (1991) to define implemented CS. implemented CS is an established mindset throughout a company to run business sustainably that is shown in sustainability-enforcing behaviors and decisions. Eventually, CSM encompasses all efforts by a company to enhance its effects on the CS dimensions in order to run its businesses (more and more) sustainably (Grothe and Rogall 2013; Starik and Kanashiro 2013; Schaltegger et al. 2016).

Existing research has elaborated on different industry-, even company-specific areas (e.g., Porter and Kramer 2006; Poisson-de Haro and Bitektine 2015) within the social, environmental, and economic CS dimensions. Examples span local community support (Wagner and Hense 2016), reducing air emissions and climate change (Sharma and Vredenburg 1998), and anti-corruption (Frynas 2005). Moreover, a great variety of CSM components has been gathered (Lindgreen et al. 2009b; Helmig et al. 2016). For example, scholars discussed CS-related strategies (Porter and Kramer 2006), responsibilities (Vidal et al. 2015), CS reporting (Mio 2010), as well as CS-enforcing cultures (Linnenluecke and Griffiths 2010). However, guidance remains very limited on choosing CS areas and CSM components, and how they contribute to implemented CS.

Additionally, past research has revealed interdependencies, e.g., among CS areas, CSM components and with a company's context (Yuan et al. 2011; Mason and Simmons 2014). The presumption of interdependent CS areas and CSM components is that they form a system, in which they complement or even reinforce each other to reach implemented CS.

To capture CSM comprehensively including its interdependencies, scholars have repeatedly called for a broadened theoretical basis, because frequently applied theoretical backgrounds or existing frameworks cannot explain successful CSM for reaching implemented CS (Wood 2010; Starik and Kanashiro 2013; Yazdani and Murad 2015). On the basis of existing research and practice insights from a qualitative study, I develop the CS system as CSM framework grounded in general systems theory, esp. the comparable concept of human resource (HR) systems (see also chapter 2).

By introducing the CS system, this paper offers the following contributions: It yields a comprehensive view on elements that matter for implemented CS by i) outlining

potentially relevant areas for companies to address beyond the rather generic social, environmental, and economic CS dimensions; ii) by structuring CSM components along their purpose; and iii) by dedicatedly elaborating on 'fit' as important influence. The CS system meets the requirements stressed in previous research for an advanced CSM framework. All in all, it guides practitioners in enhancing their CSM efforts and paves promising avenues for advancing research.

In order to yield these contributions, the paper proceeds as follows: First, a research overview is provided to reveal requirements of a CSM framework. Second, I describe the methodology for the conducted qualitative study yielding in-depth insights from practice for refining the suggested framework. Thirdly, the findings are presented in form of the CS system. Finally, I discuss contributions to practice and propositions for further research.

4.2 Research overview

Early agreement was reached that implementing CS requires proactive company-wide efforts in CSM (Clarkson 1995; Murphy 1988). Managing CS means to address CS areas by using according CSM components (Buehler and Shetty 1975; Dechant et al. 1994; Elkington 1994). A recent review of frameworks revealed that CSM shall address CS areas and consider CS as multilevel concept (Chofreh and Goni 2017). The research overview at hand goes beyond these findings in order to close the gaps due to scattered insights on how CS should exactly be managed to get implemented (Lindgreen et al. 2009b). The summary of major CSM frameworks in table 2 sets the basis for developing an advanced CSM framework.

Firstly, existing research widely treats CSM as phenomenon to be handled at company level by offering step-wise guidance (Maon et al. 2009), drivers for chosen CSM components (Vidal et al. 2015), interdependencies (Kleine and Hauff 2009), and

performance impacts (Wood 1991). However, not only the company level matters for CSM but also contexts at institutional level (e.g., business environment; natural environment; stakeholders) and individual level (e.g., person's CS attitudes and perception) (Wood 1991; Loorbach et al. 2009). Thus, a future CSM framework shall elaborate CSM from companies' perspectives while considering influences at institutional and individual level, too.

Secondly, most existing frameworks state that CSM requires the addressing of the social, environmental, economic CS dimension – either by prioritizing (Maon et al. 2009; Vidal et al. 2015) or balancing them (Kleine and Hauff 2009; Hahn et al. 2015). However, it remains unclear which precise CS areas are covered in each CS dimension (Delai and Takahashi 2011). Regardless, all these scholars agree that a comprehensive, holistic approach covering the CS dimensions is needed. All in all, scholars and practitioners shall receive more granular guidance on what to address as CS areas.

Source	Focus	Background	Areas	Components	Reaching implemented CS
Wood 1991	Drivers of CS-related performance	Past models explaining CS (e.g., Carroll 1979)	n/a	– Principles to clarify responsibility at institutional, organizational, individual level – Processes of responsiveness at organizational level – Outcomes of organizational behavior	Principles, processes of responsiveness and outcomes needed jointly
Azapagic 2003	Systematic, step-by-step CSM	Systems theory, ISO norms on environmental and quality management	Prioritized areas along social, environmental, economic CS dimensions	Cycle of defining and refining: – CS strategy – Plans and responsibilities incl. resource allocations – Implementation of plans – Communication – Progress review and corrective actions	Systematic approach along cycle to integrate CS into business activities
Maon et al. 2009	Change-oriented, step-by-step CSM	Change management	Prioritized areas along social, environmental, economic CS dimensions based on key stakeholder needs	Change cycle of four phases: – Sensitizing (awareness) – Unfreezing (CS understanding, vision, plan) – Moving (implementation of plan; evaluation of progress; communication) – Refreezing (institutionalizing CS; communication)	Company-encompassing change and stakeholder dialogues needed
Kleine and von Hauff 2009	Integrative CSM for CS-related performance	Stakeholder theory, integrative approaches in total quality management	Interlinked areas along social, environmental, economic CS dimensions	– Horizontal integration of stakeholders, functions, departments etc. – Vertical integration along hierarchies to avoid half-hearted efforts	Integration of CS dimensions and of stakeholders is decisive, communication is important facilitator
Loorbach et al. 2009	CS strategies and related transitions	Coevolutionary approach of sustainable development of societies and companies	n/a	– Transition model of CS strategy based on different levels, e.g., corporate vs. macro-level, company's strategic / tactical / operational management levels – Stages of transition spanning predevelopment, take-off, acceleration, stabilization	Governance insights using system view of company / its surroundings is key, collective learning during acceleration / stabilization phase
Epstein and Rejc Buhovac 2010	Drivers of CS-related performance	n/a	n/a	– Hard components: Processes to define CS strategy, structure, program; performance tracking; rewards – Soft components: Leadership; culture; people	Combination of hard and soft CSM components is decisive

Table 2: Summary of major CSM frameworks

Source	Focus	Background	Areas	Components	Reaching implemented CS
Yuan et al. 2011	Change-oriented, integrated CS-related practices	Core vs. periphery model in contingency theory, change mgmt.	n/a	– Patterns for integrating CSM practices as core vs. peripheral company management practices	Fit of CSM components to another, to company-internal, -external context is crucial
Baumgartner 2014	Systematic CSM	Systems theory, strategic management models	Social, environmental CS dimensions along different units / functions of company	Company management levels to structure components: – Contextual level (business environment, needs) – Normative level (attitudes, values, culture) – Strategic level (CS strategy, plan, progress) – Operational level (execution of CS strategy, plans)	Each level needed; reached via legitimation (contextual and normative level), effectiveness (strategic level), efficiency (operational level)
Mason and Simmons 2014	Drivers of CS-related per-formance from stakeholders' view	Stakeholder theory	Stakeholder expectations along social, environmental, economic CS dimensions	– Stakeholder-oriented philosophy – CS strategy – CS processes / operations incl. hard components (management systems), soft components (culture) – CS-related reporting	Systematic approach of identifying and addressing prioritized stakeholder expectations is necessary
Hahn et al. 2015	Tensions in CSM	Strategic management of tensions	Interlinked areas along social, environmental, economic CS dimensions	– Approach for handling tensions: Analysis, design, implementation, monitoring, controlling along strategies (accepting, separating, synthesizing) – Framework to identify sources for tensions: Across levels (institutional, organizational, individual level), among CS dimensions, over time (short- vs. long-term focus)	CS implementation requires systematic, integrative view on potential CS-related tensions and handling them
Vidal et al. 2015	Drivers for CSM	Model by Wood (1991)	Prioritized areas along social, environmental, economic CS dimensions	– Internal drivers (culture, philosophy, strategy) – Organizational structures (rules, responsibilities, decision-making process, communication) – Attributes of CSM components (place of origin in company, needed efforts to implement component, scope of change, degree of standardization) – Formal processes for establishing CSM components (policies, teams, progress monitoring)	CS implementation entails continuous improvement and handling of interacting CSM components

Table 2: Continued

Thirdly, CSM components play a decisive role, but they vary greatly across frameworks. This supports findings in my CS research review focusing on energy companies (chapter 3). Therein, CSM components seemed to have an implicit structure according to their purpose for implementing CS. The here reviewed, cross-sector CSM frameworks put components into a structure, e.g., hard vs. soft components (Epstein and Buhovac 2010; Mason and Simmons 2014), step-wise approaches (Maon et al. 2009; Azapagic 2003), or along they purpose in line with normative, strategic, tactical, and operational company management levels (Baumgartner 2014; Loorbach et al. 2009; Wood 1991). Especially the latter structure helps to comprehensively capture CSM components and their contributions towards implemented CS. Classifications as hard vs. soft components cannot explain interdependencies and components' contributions, because they treat components in separated, generic categories. Moreover, step-wise approaches are limited to few mostly strategic, less operational CSM components and consider interdependencies between them only when defining CSM components, rather than throughout their existence. For example, CS-enforcing or -limiting values always influence CS strategies and execution of resulting plans which is not reflected in approaches focusing on each of these CSM components after the other. In contrast, grouping CSM components by their purpose and in line with companies' normative, strategic, tactical, and operational company management levels overcomes these shortcomings. Additionally, this clarifies who mainly shapes and is affected by CSM components throughout the company (Baumgartner 2014). Consequently, CSM components shall be structured comprehensively along their purposes, and in line with company management levels.

Fourthly, fit seems to be decisive for reaching implemented CS as basis for performance impacts (Yuan et al. 2011; Kleine and Hauff 2009). This need of fit is widely implied, e.g., in step-wise approaches where components built upon another (Azapagic

2003), or in claims to meet stakeholder expectations (Mason and Simmons 2014). Thus, an advanced CSM framework has to consider fit as influence. In more depth, fit shall be established among CSM components and CS areas. Additionally, fit requires integration of CS with existing company-internal management and -external contexts.

Last but not least, existing frameworks are based on different backgrounds like stakeholder theory, change-related theories, and models from strategic management or CS research (see table 2). Although these backgrounds seem disperse at first sight, they are all utilized to stress the need to dedicatedly manage CS-related complexity, e.g., due to tensions among social, environmental, economic objectives (Hahn et al. 2015), varying stakeholder expectations (Mason and Simmons 2014), or usual vs. new procedures in companies' management (Vidal et al. 2015; Yuan et al. 2011). However, scholars have criticized most backgrounds, because they lack a holistic perspective and cannot meet the requirements for a CSM framework derived above (Starik and Kanashiro 2013; Lee 2008; Wood 2010). A promising exception is general systems theory (Starik and Rands 1995; Knez-Riedl et al. 2006; Göllinger 2012) which shall be used for developing an advanced CSM framework in this paper.

General systems theory coined for social sciences by von Bertalanffy (1950) has been utilized to treat several phenomena as systems like CS-related projects (Vrečko and Lebe 2013), sets of stakeholders (Mason and Simmons 2014), or entire companies (Göllinger 2012; Ulrich 1984). In this paper, I suggest managing CS as system itself.

I base the CS system on the comparable concept of HR systems which gained attention in research thanks to the seminal work by Huselid (1995). Today, HR systems are well-established in HR research (Ostroff and Bowen 2016). It is possible to transfer the core elements and research insights of HR to CS systems, because HR and CS management

require similar approaches and mutually support each other in reaching their objectives (Voegtlin and Greenwood 2016; Jamali et al. 2015; Morgeson et al. 2013).

In particular, HR systems offer insights along all requirements derived for an advanced CSM framework. As such, scholars have found that dedicatedly managing HR systems at company level is decisive for reaching desired implementation and performance impacts (Huselid 1995; Becker and Huselid 1998). This entails addressing different HR-related areas with the help of a set of HR management components – not selected single ones. The HR management components are grouped to four levels matching company management levels (Ostroff and Bowen 2016; Posthuma et al. 2013). Moreover, fit within HR systems and to other systems like companies and external contexts has been stressed as decisive for achieving desired impacts (Kepes and Delery 2007). Additionally, influences from external contexts and individuals matter in HR systems, too (Ostroff and Bowen 2016; Caldwell et al. 2011).

However, it is not only relevant to understand and transfer insights from HR to CS systems. CS has to meet all attributes of social systems provided in seminal works in this field (von Bertalanffy 1950; Parsons 1951; Ulrich 1984). Looking at these attributes, I conclude that CS does meet all of them and thus, can be treated as a social system (see also section 2.6 in my dissertation). This conclusion is based on the following argumentation supported by previous research: A system is a set of elements as constituent parts, here CSM components and addressed CS areas, which jointly achieve outcomes (Baumgartner 2014; Aguinis and Glavas 2012). The set of elements forming a system achieves a larger output than the sum of the single elements in isolation. This is fostered by fit of these constituent parts (Yuan et al. 2011). In order to increase fit and resulting system outcomes, CSM components and addressed CS areas shall be managed accordingly (Vidal et al. 2015;

Margolis et al. 2007). Moreover, CS areas and CSM components are dynamic and specific (Bansal 2005; Maon et al. 2009). This is linked to the fact that CS as system is interdependent with outer systems like the company itself or business environments (Göllinger 2012; Mason and Simmons 2014). Consequently, equifinality is given, i.e., the "same final state may be reached from different initial conditions and in different ways" (von Bertalanffy 1950, p. 40). Last but not least, holism of systems matters which is reflected in calls for comprehensive CSM components addressing all relevant CS areas of a company (Starik and Kanashiro 2013).

Consequently, I can suggest CS as own system. This preliminary idea of a CS system shall be contrasted with findings from qualitative research in order to develop a refined, advanced CSM framework.

4.3 Methodology

Qualitative research is particularly appropriate to obtain in-depth insights and explanations of complex, still weakly understood constructs like CS, its management and implementation (Eisenhardt 1989; Myers 2010). I used in-depth interviews enriched with additional information provided by and about the companies of interest to refine theory.

Thus, I investigated eight companies for their CSM approach as multiple case studies. In particular, I analyzed seven energy companies and one of their key suppliers. Companies connected to the energy sector are particularly insightful for refining a CSM framework. They faced high external pressure for CS engagement early on. Today, increasing awareness of managers has led to advanced CSM approaches, esp. in European energy companies (Bolton et al. 2011; Poisson-de Haro and Bitektine 2015; del Mar Alonso-Almeida et al. 2014). Two main reasons have led to the high focus on CS engagement in the energy sector: On the one hand, companies connected to the energy

sector play a crucial role in society and economy by securing a stable energy supply (Ströbele et al. 2010). On the other hand, they also cause controversies due to their strong market position (Parast and Adams 2012) and imposed threats to the environment (Pätäri et al. 2014; Aragon-Correa and Sharma 2003), or health and safety of employees and local communities (Vaaland and Heide 2008; Frynas 2005).

According to theoretical sampling, the chosen companies had to be public, large with more than 250 employees (European Commission 2017), and headquartered in countries of the European Free Trade Association. Theoretical sampling helped to control for influences from these company characteristics. Moreover, I selected the eight companies shown in table 3 for their good reputation for advanced CSM according to third-party ratings and recommendations from experienced consultants specialized in CSM. Moreover, I aimed at covering different energy industries with three electric utilities, two municipalities being also active as DSOs, one TSO, one O&G company, and one supplier to such energy companies.

For rich insights, I analyzed information from different data sources like companies' CS reports, news reports and interviews that I conducted (Yin 2009; Eisenhardt and Graebner 2007). In total, I interviewed eleven experts, so eight persons being responsible for CSM in their company and three CSM consultants. For the interviews lasting circa one hour each, a semi-structured interview guideline was used. Interviews took place between July and October 2016 in German or English language to ensure best understanding of interviewees and interviewer. Out of the eleven interviews, eight were conducted face-to-face and the remaining three via telephone.

Company	Industry	Energy mix	Employees	Revenue (MEUR)	CSM reputation	Interviewees	Additional data
C1	Electric utility	Mainly renewable energy sources	~43,000	~116,000	A in CDP (former Carbon Disclosure Project), Silver Class by robeccoSAM	CS manager in strategy department (in person, recorded) Strategy consultant for CSM (telephone, recorded; quoted CO1 / CO3)	Corporate CS report, news reports, onsite HQ observation
C2	Municipality; Distribution system operator	Mix of energy sources	~2,700	~2,000	Regional awards for fairness, CS engagement	CSM coordinator in communication department (in person, recorded)	Corporate CS report, news reports, onsite HQ observation
C3	Electric utility	Mix of energy sources	~5,500	~4,000	C+ oekom corporate rating	CSM coordinator in strategy department (in person, recorded) Strategy consultant active in CSM (telephone, recorded, quoted CO3)	Corporate CS report, news reports, onsite HQ observation
C4	Electric utility	Mainly fossil energy sources	~60,000	~46,000	A in CDP (former Carbon Disclosure Project), C+ oekom corporate rating	CSM coordinator in communication department (in person, recorded) Project leaders in CS consultancy (in person, notes taken; quoted CO2)	Corporate CS report, news reports, onsite HQ observation
C5	Municipality; Distribution system operator	Mainly renewable energy sources, gas	~2,000	~2,000	Part of B.A.U.M. e.V., winner of national CS award	CSM coordinator as part of CEO management office (in person, recorded) Project lead in CS consultancy (in person, notes taken; quoted CO2)	Corporate CS report, news reports, onsite HQ observation
C6	Transmission system operator	Not applicable	~20,000	~21,000	C+ oekom corporate rating; B in CDP (former Carbon Disclosure Project)	Two CSM coordinators in cross-functional departments (in person, recorded)	Corporate CS report, news reports
C7	Oil & gas company	Mainly fossil energy sources	~21,500	~53,000	Prime status in industry in oekom corporate rating, 2. most sustainable oil & gas company acc. to Corporate Knights	CS manager in strategy department (telephone, recorded) Strategy consultant active in CSM (telephone, recorded; quoted CO1)	Corporate CS report, news reports, onsite HQ observation
C8	Supplier to energy companies	Not applicable	~351,000	~80,000	DJSI, most sustainable company acc. to Corporate Knights, Prime status in industry in oekom corporate rating	CSM coordinator in strategy department (in person, recorded)	Corporate CS report, news reports, onsite HQ observation

Table 3: Overview of sample (Remark: No information on country of headquarters provided to ensure anonymity of companies; amount of employees and revenues as of fiscal year 2016; Sources: Thomson Reuters EIKON, corporate websites)

These interviews were transcribed, either from records or notes. I coded information along a pre-defined coding scheme to reduce bias, before I conducted within- and cross-case analysis to derive findings (Eisenhardt 1989). While within-case analysis allows understanding each company's CSM approach, comparing companies improves rigor and quality of results (Yin 2009). I continuously refined findings by going back and forth between insights from research and practice during my data analysis (Spiggle 1994). I summarized exemplary quotes from the case studies in tables 4, 5, and 6[14]. In total, the case studies' insights allow enriching CSM research, and presenting a refined CS system as advanced CSM framework.

[14] Quotes from interviews conducted in German were translated to English by the author.

CS areas	Exemplary company quotes							
	C1	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**
Stakeholder engagement	"Sustainability governance council has a representative per stakeholder group."	"Regarding stakeholder exchange, we score second place in our industry."	"Stakeholder dialogue – that is rather standard."	"At [stakeholder] dialogues, we inform about planned projects, or advantages of renewable energy sources, reasons for grid extensions (...). This is education to the public."	"There is a stakeholder council of independent persons (...) bringing in their topic-related or overall expertise that is important for us to reflect our activities."	"Engaging with citizens is important (…) We have a dedicated unit (...). These colleagues are actually constantly involved in citizen dialogues, (...) de-escalation management."	"We are in need for stakeholder engagement (...). This is extremely important when coming into a new country where maybe there has never been oil and gas exploration before."	"We proactively engage with our stakeholders."
Human rights							"We defined sustainability along several dimensions [including] labor and human rights."	
Labor practices	"We have a strong safety culture (...) and labor rights. We could do more in education and training."		"Topics affecting employees, esp. security and health, have gained significantly in relevance."	"We do a lot for employees' safety and health."		"Employees' safety and health are crucial for us."		
Fair operating practices	"We co-founded the Better Coal initiative which also considers human rights."	"It covers fair, collaborative handling of customers, (...), suppliers."	"This is important for selected topics (...) [like] where do energy sources, esp. coal come from?"			"Fair trade and operating practices – that is well-addressed by us."		"We are quite strong in responsible supply chains" "Anti-corruption – it can be seen as pioneering now."

Table 4: Case study evidence for CS areas

CS areas	Exemplary company quotes							
	C1	C2	C3	C4	C5	C6	C7	C8
Consumer issues	"A focus area is 'We listen to our customers and treat them fairly', 'We help customers to optimize energy use'"		"Stable and secure energy supply is key for utilities."					"The largest contribution is our portfolio (...). We solve sustainability challenges of our customers."
Community involvement and development		"Responsibility towards our region is a core part of our self-concept."	"Compared to other utilities, it has lower priority for us. Compared to industrial firms, we do a lot."		"We want to be innovator in the energy sector. And we want to do so with a strong regional anchorage."		"We defined sustainability along several dimensions [including] local value creation."	
Sustainable resource use **Pollution and climate change mitigation** **Biodiversity**	"We work on environmental topics with all its areas. (...) There is risk to reduce sustainability to environmentally-friendly generation technology	"High-performing technology with investments in reliable, environmentally-friendly and efficient energy supply are our focus."	"Before 2010, we used to have environmental management – not entire sustainability management."	"We do a lot for environmental protection as a company."	"We always used to have a strong focus on the ecological dimension."	"For environmental protection we have dedicated officers (...). Of course, it is a core area."	"We defined sustainability along several dimensions [including] climate, energy efficiency, (...) and environmental impact"	"One can say that our CO_2-neutral program is a real step forward in corporate environmental protection."
Economic contribution	"In many cases, it is not about deciding between economy or environment anymore; they are rather seen as interlinked."	"Long-term economic success is the basis for social and environmental engagement."	"Economic contribution is important, of course."	"Of course, sustained business success is the overarching goal."	"We realized (...) that we also need other dimensions, esp. economic viability, to reach a healthy balance."			"It means to be sustainable in all dimensions: People, Planet, Profit. There is no dimension outweighing the others."

Table 4: Continued

Levels of CSM components	Exemplary company quotes							
	C1	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**
CS philosophies	"In the long-run, culture, values, norms are crucial (...) as a compass directing employees' decisions."	"It is a matter of culture. At C2, it still requires some careful tact (...) and may cause negative reactions."	"We do have sustainability principles (...). Explicitly shaping values is not part of my tasks."	"We have a code of conduct."	"Regarding culture, values, (…), we are already at a solid stage (...). There is a very high sensibility and a very high identification with the topic."	"Our codex shows sustainability explicitly."	"We have it [sustainability] as part of the corporate values. (...) C7 Book sets out (...) the basic principles for how we work."	"Our goal is to establish sustainability in our company, so sustainable thinking (...) along our 12 principles."
CS policies – strategic objectives	"For each sustainability focus area, we have defined objectives (...). We want to develop them even more closely with our businesses along the value chain."		"I see my focus in setting a strategy, so in elaborating and discussing objectives, focus areas."	"Sustained business success is our overarching goal (...) for which we need society's trust and acceptance. For this (...), we need to report transparently (...). Therein, we have 10 areas of action and we define according targets."	"We need to further (...) work on the topic strategy, focus and objectives."		"It kind of varies a bit year to year (...) at the moment strategic aspects – that is the most important for us."	"At the beginning, our CEO referred to sustainability as sustainable value creation (…) meaning Profit. (...) his understanding evolved constantly and by now he sees the need for the balance in strategy of People, Planet, Profit."

Table 5: Case study evidence for levels of CSM components

Levels of CSM components	Exemplary company quotes							
	C1	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**
CS policies – responsibilities	"We face great momentum, also because our CEO is Chief Sustainability Officer." "We define key responsible to achieve greater commitment."	"Structures and responsibilities are important, because you need someone driving this topic." "Sustainability management used to belong to the strategy department Nowadays, I am (...) assigned to the communication department"	"Additionally, clear responsibilities are important (...) as enabler." "Sustainability management is done in our strategy department (...) with a steering function (...) to ensure that things get done somewhere." "We also have special committees (...) like for energy efficiency."	"Corporate Responsibility unit takes care of setting ambitious targets (...) and is in continuous exchange with single CR- and environmental officers." "For certain topics, we have so-called Center of Expertise like employee safety and health, or compliance."	"We dissolved sustainability management as own unit and integrated it into the department 'executive office, compliance and sustainability.'"	"We have dedicated officers for environmental aspects (...), HSSE (...), governance (...) and us coordinators. (...) but decision needs to be taken by C6 management."	"The objective (...) is to set the direction for the rest of the company when it comes to these elements [of sustainability]." "These are very long-term, important and challenging dilemma for our industry. (...) And that is also why corporate sustainability (...) is in our strategy."	„For anchoring and clear responsibility, there is a Chief Sustainability Officer in C8". "We [as sustainability office] are fully integrated in the strategy department by now (...) – right where it belongs."
CS practices	"We co-define targets with operational units, because we leave 'how to achieve targets' to them." "Guidelines cannot serve as compass like cultures."	"We have a program with targets and measures, which we review (...) annually." "Management systems seem to gain higher relevance (...), also our customers ask for it."	"We have a sustainability program." "Guidelines (...) that is what one has in place (...), but impact is created by direct work instructions (...) and lived processes."	"The corporate responsibility program (...) has defined targets along 10 areas of action, KPIs and due dates. (...) Once targets are set, the single departments plan measures."	"We want to be able to say, these are four, five strategic focus areas in (...) a sustainability program (…) We experience that it is hard to communicate a decentral approach externally."	"We get a lot of directives (...). That needs to be reflected and adjusted in our corporate guidelines. So, we (...) ensure that new or existing processes match them."	"If you really want to make a change within one area, you need to make sure that you have in place mechanisms and guidelines to steer toward that overall strategic objective."	"Today, one may argue which of our seven KPIs (...) focus on sustainability; actually, all of them (...)"

Table 5: Continued

Levels of CSM components	Exemplary company quotes							
	C1	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**
CS processes	"We pay high attention to technical hand-ling of proce-dures, (...), management systems."	"We have a sustainability radar (...) to review progress to targets in a traffic light system with our executive board."	"We have an environmental management system. There are also energy management and performance measurement systems."	"It is checked throughout a year whether we move in the right direction or which additional measures need to be taken."	"Concerning the topic management systems, we have made relevant progress in the last years. (...) We have a solid stage currently." "There is a Top-Management-Reporting, regularly and based on KPIs."	"Currently, we are ISO 14001 certified, but analyze this (...) so that we receive EMAS certification this year."	"We have extensive management systems that are quite well (...) implemented and understood." "Operational small improvements make the difference."	"C8 has several management systems, like an environmental management system, the integrated C8 One Management Model."

Table 5: Continued

Types of fit	Exemplary company quotes							
	C1	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**
Vertical coherence	"For each sustainability focus area, we have defined objectives, according KPIs and developed processes with businesses."			"We pay attention (...) to set targets, to shape procedures (...) and measure performance in a way for achieving these targets."	"One has corporate values, a strategy, which results in programs (…). It is an on-going work along top-down and bottom-up principles."		"That is based on the maturity. (...) On the part pertaining to transparency (...), there is a very holistic and uniform way of handling these issues, from policy to reporting to management and understanding."	"As first step we think about what sustainability means for us? Which elements are most important (...)? The second step regards to which ambition level does one have? (...) Then we turn to 'form follows function, structure follows strategy'. Then it is clear what has to be done operationally."
Horizontal coherence		"My job is to combine existing initiatives and foster cross-unit topics."			"If I have contradictions not being centrally resolved, then every employee would have to solve them individually. This is not a good idea."			"If you want to excel, you can take some trade-offs between People, Planet, Profit; analyze and solve them. (...) Well, I have not yet managed that."

Table 6: Case study evidence for types of fit

Types of fit	Exemplary company quotes							
	C1	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**
Company-internal consistency	"We advocated for not having a separate sustainability strategy parallel to a corporate strategy. (...) Any other way would serve communication purposes."	"We decided against an additional sustainability strategy (…), because we want to become sustainable as company overall."	"Corporate strategy goes hand-in-hand with sustainability."	"We reviewed key procedures like supply of coal, retailing (...) for sustainability risk and value add."	"We mapped core topics [for sustainability] to our vision and mission which are part of the corporate strategy. The good, yet surprising result was that we have a very high congruence of more than 90%."	"An integrated sustainability and financial report exists."	"These elements need to be embedded in the way we work, in the way we make decisions and in the way we measure our performance and reward employees to actually get sustainability fully integrated."	"One has to consider how the company ticks."
Company-external consistency			"What happens in the outside world? (...) Then one should not only anchor it in processes, but also to act upon these impulses."	"We have to incorporate environmental, social, econo-mic impacts in our decisions like principal investments – all those impacts that external stakeholders confront us with."			"A sustainability manager in one business area may have very different sustainability risks and issues compared to another one."	"The external requirement profile for sustainability diverges between different countries."

Table 6: Continued

4.4 Findings: The corporate sustainability system

I developed and refined the CS system illustrated in figure 7 based on general systems theory, esp. the comparable concept of HR systems as outlined in section 4.2, as well as insights from my qualitative study.

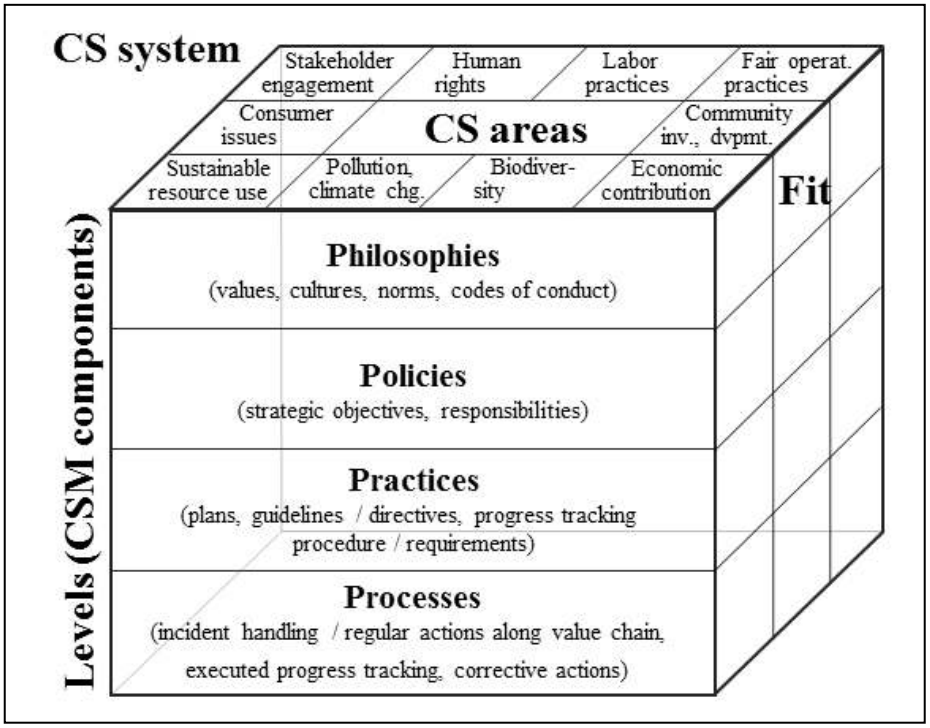

Figure 7: CS system (hint: any illustration of a CS system simplifies reality, e.g., further CSM components per level may exist)

The relevance of a systems approach to CS was also stressed in interview statements like "you need to systematically make sure that (…) these elements are so important that you are willing to change the direction of the company" (C7). To introduce the CS system, I present findings on CS areas, on CSM components grouped to four CS system levels, and on the role of fit.

4.4.1 CS areas

CS as concept aims at capturing broader effects of business conduct going beyond sole financial impacts (Elkington 1994). When effects along the social, environmental, and economic dimension of CS are not understood, they easily become an "Achilles' heel" due to unaddressed stakeholder expectations (Hahn et al. 2015, p. 301). For addressing expectations on these rather abstract dimensions, a company needs more granular, self-explanatory CS areas to decide on how to prioritize and balance CS engagement (Kleine and Hauff 2009; Vidal et al. 2015). Unfortunately, CSM research is of little help in this regard. However, practitioners in my qualitative study stressed practice-oriented CSM instruments they use for capturing CS areas like the ISO 26000, GRI G4 and UN Global Compact (C2, C7, CO3).

Looking closer into the ISO 26000, GRI G4 and UN Global Compact, it became clear that the ten principles of the UN Global Compact (UN 2014), indicators in GRI G4 standard disclosures (GRI 2013b) and core subjects of ISO 26000 (ISO 2016) yield a comprehensive and complementary collection of CS areas. This reinforces conclusions in CS accounting research in which these the ISO 26000, GRI G4 and UN Global Compact have been compared and found complementary (Zinenko et al. 2015; ISO and GRI 2014). For the purpose of CSM research, I suggest constructing the CS areas in the CS system framework based on ISO 26000, GRI G4 and UN Global Compact as most common, comprehensive and complementary CSM instruments in practice. Analyzing them reveals ten CS areas as summarized in table 7.

CS areas	Main CS dimension	Description	Source
Stakeholder engagement	Social, Economic, Environmental	Identifying, involving, informing stakeholders	ISO 2016; GRI 2013
Human rights	Social	Ensuring internationally defined human rights in company like non-forced labor, right of association, non-discrimination of vulnerable groups; fostering human rights throughout supply chain	ISO 2016; UN 2014; GRI 2013
Labor practices	Social	Ensuring employees' rights like fair wages, collective bargaining, health and safety, development and education; fostering favorable working conditions like involvement, work-life balance	ISO 2016; UN 2014; GRI 2013
Fair operating practices	Social, Economic	Fostering fairness to business partners, regulators, NGOs, e.g., regarding anti-corruption, fair prices, involvement, respected property rights	ISO 2016; UN 2014; GRI 2013
Consumer issues	Social, Economic	Providing safe, high-quality products / services along their entire lifecycle; meeting needs; ensuring data security; transparent marketing labeling	ISO 2016; GRI 2013
Community involvement and develop-ment	Social, Economic	Creating and sharing local value; involving and informing communities at operating sites; ensuring communities' health and safety; providing support to infrastructure, culture, education	ISO 2016; GRI 2013
Sustainable resource use	Environmental	Fostering sufficiency approach to save materials, energy, other input factors along product / service lifecycle, company's operations and supply chain	ISO 2016; UN 2014; GRI 2013
Pollution and climate change mitigation	Environmental	Reducing and preventing air emissions, land and water pollution, waste along product / service lifecycle, company's operations and supply chain	ISO 2016; UN 2014; GRI 2013
Biodiversity	Environmental	Protecting and restoring natural habitats; avoiding adverse effects, esp. on endangered species	ISO 2016; GRI 2013
Economic contribution	Economic, Social	Fostering going-concern; creating wealth; paying taxes; creating local jobs and income; strengthening adjacent local businesses / partners	ISO 2016; GRI 2013

Table 7: Overview of CS areas

The CS areas are comprehensively exhaustive but not mutually exclusive as some areas like fair operating practices regard to more than one CS dimension. Nevertheless, I am convinced that structuring CS areas along CSM instruments used in practice will help advancing CSM. Thus, the CS system framework offers a clearer, comprehensive overview on what to address within the abstract CS dimensions. As additional contribution, my qualitative study emphasizes that companies need to address prioritized CS areas that jointly cover all three CS dimensions (e.g., C1, C3). This means that a company's CS

system consists of sub-systems to best manage efforts regarding prioritized CS areas. This nested character is typical for social systems (von Bertalanffy 1950). Last but not least, using common, practice-oriented CSM instruments allows to commonly referring to self-explanatory CS areas. The self-explanatory, structured CS areas yield a common understanding as basis for reaching implemented CS as mindset in each company and across companies.

Looking at single CS areas, all companies paid high attention on stakeholder engagement. Companies see stakeholder dialogues as "standard" (C3) or have "a dedicated unit (...) [added: of] colleagues (...) constantly involved in citizen dialogues" (C6).

Moreover, all companies placed high emphasis on environmental concerns, esp. pollution and climate change mitigation as well as sustainable resource use. For example, C6 underlines this by stating "of course, it is a core area" (C6). However, "there is the risk to reduce sustainability to environmentally-friendly generation technology" (...) "which does not automatically mean that I [added: as a company] am sustainable" as pointed out by C1. The dominance of the environmental dimension is in line with findings of my CS research review focusing on energy companies (chapter 3). It becomes more apparent that there are downsides and that such a dominance needs to be circumvented in practice.

Additionally, economic success was stressed as crucial by companies (C1, C2, C3, C4, C5, C8), and by sustainability consultants who perceived it as core objective of consulting projects (CO1, CO3). This is in line with past research results on a prevailing short-term pressure for financial success (Steger 2004). However, my qualitative study revealed two different perspectives on economic success within CS: On the one hand, companies strive for a balance of CS dimensions – after they had faced the issues of imbalance before. For example, the electric utility C1 stated that "in many cases, it is not about deciding between

economy and environment anymore; they are rather seen as interlinked". Similarly, the municipality C5 having had a strong focus on environmental areas stressed that "we realized (...) that we also need other dimensions, esp. economic viability, to reach a healthy balance". On the other hand, other investigated companies emphasized economic success as basis for CS. For example, "long-term economic success is the basis for social and environmental engagement" (C2), or "of course, sustained business success is the overarching goal" (C4). This suggests that there is continued debate in practice on why to engage in CS which receives limited attention in research (Kleine and Hauff 2009).

The last two CS areas which were stressed as relevant across companies in my qualitative study cover labor practices and local community engagement. Regarding labor practices, the investigated companies connected to the energy sector paid high attention on health and safety of employees (C1, C3, C4, C6, C7) stating, e.g., "we have a strong safety culture (...) and labor rights" (C1). Additionally, those energy companies being active in one community (e.g., C2, C3, C5) or in developing countries (C7) emphasized local community engagement "with a strong regional anchorage" (C5) and development with "local value creation" (C7) as relevant CS area.

Moreover, it became apparent that CS areas evolve dynamically which underlines the system character of CS engagement. Practitioners stressed that ad-hoc addressing of newly occurring stakeholder concerns is important, e.g., for newly acquired projects (C7), which complements the usual annual review and prioritization of CS areas during CS report preparation (C3, C7).

4.4.2 Levels of CSM components

In order to manage CS along all its areas, the CSM components come into play. One requirement for an advanced CSM framework was a comprehensive structure of CSM components along their purpose for reaching implemented CS (chapter 4.2).

In line with HR systems (Ostroff and Bowen 2016; Kepes and Delery 2006), the CS system contains four levels being philosophies, policies, practices and processes. Simply put, philosophies offer overall guidance; policies define strategic objectives and responsibilities; practices specify plans and according progress tracking towards objectives; and processes represent the execution according to such specifications.

Before discussing them in more detail, it is worth recalling that any advanced CSM framework shall also structure CSM components in line with company management levels. A comparison of HR system and CS system levels to company management levels shows the following mapping: Philosophies match the normative company management level. Policies regard to strategic company management level. Practices and processes reflect the tactical and operational company management levels, respectively. I reach this conclusion based on past research which looked at company management levels in more depth (Baumgartner 2014; Loorbach et al. 2009). The CS system levels shall be introduced next.

4.4.2.1 Philosophies

Philosophies provide overall guidance by clarifying what is preferable (Mosher and Smith 2015; Baumgartner 2014; Ostroff and Bowen 2016). CS philosophies are found in written and / or lived corporate values (Ketola 2008) or in codes of conduct (Paine 1994) forming corporate cultures (Linnenluecke and Griffiths 2010). They foster, e.g., cooperation, justice, honesty and protection (Florea et al. 2013; Ketola 2008; van Buren and Greenwood 2013).

Although CS philosophies are highlighted as success factors (Dechant et al. 1994; Mosher and Smith 2015) and were empirically found to instill CS engagement throughout companies (Übius and Alas 2009), many companies still pay insufficient attention on this CS system level (Lindgreen et al. 2011). The results of my qualitative study support this finding: The majority of CS coordinators did not actively shape values or cultures (C2, C3, C4, C6, C7). The CS consultancy CO1 stated that "culture and values are less tangible and rarely a topic in projects". Instead, companies see the CS system level of philosophies as addressed by having a code of conduct. All analyzed companies had a code of conduct. Additionally, some companies also defined CS principles that outline general cornerstones for behaviors (C3, C8). However, the relevant role of philosophies was esp. seen by C1 and C5. C1 phrased it well: "in the long-run, culture, values, norms are crucial (...) as compass directing employees' decisions." One reason for the lower attention paid to CS-enforcing values and cultures may be the long-term efforts needed to establish them. Such efforts also entail to unlearn past CS-limiting values and cultures (Maon et al. 2009). However, exactly such long-term efforts can be argued to require dedicated management.

Once established, CS-enforcing philosophies have already been found to contribute to performance impacts and in turn to implemented CS (Epstein and Buhovac 2010; Surroca et al. 2010).

4.4.2.2 Policies

Policies outline what shall be achieved in form of strategic objectives and they clarify responsibilities (Baumgartner 2014; Ostroff and Bowen 2016). Doing so, policies help shaping company-internal mindsets and fostering a perception of everyone's CS-related duties (Vidal et al. 2015).

Strategic objectives define long-term aspirations and resulting mid- or short-term goals (Kapstein and Wempe 2001; Baumgartner 2014). CS-related strategic objectives received significant attention (e.g., Porter and Kramer 2006). Consequently, CS became a mainstream topic in strategic management research (Robertson 2008; Engert et al. 2016). The investigated companies in my qualitative study showed awareness of the relevance of CS policies in practice. It became esp. clear in the statement "I see my focus in setting a strategy, so in elaborating and discussing objectives" (C2). Moreover, there seems to be constant improvement and evolvement of CS-related strategic objectives. For example, it was stressed that "we have objectives (...). We want to develop them even more closely with our businesses" (C1), or "We need to further (...) work on the topics strategy, focus and objectives" (C5).

According to research, companies may use a vision (Maon et al. 2009), mission (Perceval 2003), and strategy (Baumgartner and Ebner 2010) as instruments for defining strategic objectives. In my qualitative study, strategy was the most commonly stated instrument (e.g., C3, C5, C8). Steps for formulating strategies are well-described in existing publications and shall not be repeated here (Porter and Kramer 2006; Lindgreen et al. 2011). In any case, all these instruments help shedding light on different CS ambition levels. Scholars distinguish, e.g., between reactive, defensive, accommodative, or proactive CS (Clarkson 1995; McWilliams and Siegel 2001). Empirical evidence shows a development towards higher ambition levels over time (Poisson-de Haro and Bitektine 2015; Singer 2016). This is also supported by my qualitative study: Energy companies showed varying ambition levels across consulting projects (CO2, CO3). Furthermore, companies being active in CSM the longest stressed a gradual deepening of their ambitions and related efforts. Statements supporting this finding are: "at the moment strategic aspects – that is the most important for us" (C7) and "at the beginning, our CEO referred to

sustainability as sustainable value creation. (...) by now, he sees the need for the balance in strategy of People, Planet, Profit" (C8).

Turning towards the second pillar of CS policies, responsibilities are defined to clarify CS-related roles, accountability, and decision-making (Wood 1991; Azapagic 2003). Clear responsibilities are a major success factor in CSM (Vidal et al. 2015; Pedrini and Ferri 2011). Responsibilities may either be formalized in organizational structures with position-specific duties or fulfilled informally (Perera Aldama et al. 2009; Slack et al. 2015). For the latter, the conviction of employees and their empowerment are decisive (Godkin 2015; Schaefer 2004).

All investigated energy companies relied widely on formalized responsibilities. This is well represented by the following statement of the municipality C2 "structures and responsibilities are important, because you need someone driving this topic". Beyond that, the municipality C5 and the TSO C6 stressed that people not having an official CS-related role also contribute to CS initiatives, raise unaddressed CS areas and offer improvement ideas.

Looking at formalized responsibilities in more depth, some companies underpin their top management's commitment to CS by nominating a Chief Sustainability Officer (CSO) (C1, C8) which created "great momentum" (C1). Furthermore, companies often install a team coordinating CSM (Pedrini and Ferri 2011). Although such a CSM coordinating team was found at each investigated company, their size and influence differed: There were one-person teams supported by an informal network of coordinators (C2) and up to 14 people coordinating CS engagement centrally with an official network of coordinators in every company business and region (C8, C7). Furthermore, coordinating teams belonged to communication departments (e.g., C2, C4), strategy departments (e.g., C3, C8) or CEO

management offices (C5) resulting in a varying influence. There was agreement across all eight interviewed CS managers that CSM belongs to strategy departments or in CEO management offices because that is “right where it belongs” (C8). The size and influence of such teams seemed to coincide with the CS-related ambition levels of the companies (e.g., lower for C2 than for C8) and is likely influenced by general characteristics like company size and regional scope, too (Perera Aldama et al. 2009).

Furthermore, CS-related committees can be established at top-management level (Klettner et al. 2014; Roy 2009). The investigated companies used only few CS-area-specific committees, e.g., for health and safety (C7) or compliance (C4). Instead, overarching CS-related boards were found more useful (C1, C5, C6, C8). They were utilized for sparring and preparing decisions by the top-management board to foster CS-related progress.

In any case, isolated CS-related responsibilities should be avoided to prevent inertia (Schaltegger et al. 2016; Salzmann 2006). This can be ensured by defining each position’s CS-related duties (Azapagic 2003). Such granular definition of CS-related duties at least down to mid-managers has proven successful in the TSO C6. CS-related duties may be established, e.g., via adjusted job profiles (Vidal et al. 2015) or debatable individual performance measurement and incentives (Slack et al. 2015; Sobótka and Platts 2010).

All in all, policies are crucial for reaching implemented CS, because goals and responsibilities shape the mindset of people. In particular, policies outline CS-related objectives and duties in the roles of companies’ managers and employees.

4.4.2.3 Practices

Practices specify what shall be done how by whom and until when in order to reach strategic objectives (Ostroff and Bowen 2016; Loorbach et al. 2009). The main CSM component at the practices level is a plan. Plans are often used to specify CS initiatives, and those initiatives are often merged into so-called CS programs (Wood 1991). In my study, the companies C2, C3 and C4 used CS programs with detailed plans for CS initiatives. Such plans contain actions and their targets, responsible units or persons, as well as deadlines (Azapagic 2003; Baumgartner 2014). It has proven important to have a clear target breakdown from overarching strategic objectives to actions per CS area and according responsible units or persons (Bernatzky 2016; Kapstein and Wempe 2001). Target setting was also stressed by many analyzed companies as starting point for defining measures and pushing for implemented CS as mindset (C1, C3, C4, C8). For ensured buy-in, "we co-define targets with operational units, because we leave 'how to achieve targets' to them" (C1).

Additionally, planning involves the allocation of human, financial and time resources in a sufficient and efficient manner (Wood 1991; Salzmann 2006). Whereas developing plans is well-captured in research and practice (Singer 2016; Baumgartner 2014; C1, C4), resources are a bottleneck. Indeed, insufficiently allocated resources have been found to impede the success of CSM for reaching implemented CS. This cannot only be found in previous research (Fairfield et al. 2010; Epstein and Buhovac 2010), but also in four companies in my qualitative study (C1, C3, C5, C6) stating, e.g., "I know (...) we should do more (...). But we simply lack resources" (C3).

Despite the advantages of clear CS practices, companies using CS-related plans are well-advised to avoid too rigid planning and should allow plan revisions given the dynamics in CS (Egels-Zandén and Rosén 2015).

Based on CS-related plans, companies adjust internal guidelines and directives accordingly (Asif et al. 2013; C1, C3, C4, C7, C8). As highlighted in my qualitative study, anchoring plans happens across all hierarchical levels, because "guidelines (...) that is what one has in place (...), but impact is created by direct work instructions" (C3). Despite the relevance of the practices level, one should not forget that "guidelines cannot serve as compass like cultures" (C1).

As another CSM component, CS practices outline (not conduct) the tracking of progress towards targets in plans (Maon et al. 2009). Therefore, requirements are specified for tracking procedures and so-called management systems that are tools to facilitate progress tracking (Zwetsloot 2003; DeBono 2004; Searcy 2012). Examples for management systems are environmental management systems (ISO 2015) or integrated Sustainability Balanced Scorecards (for an overview see also Hörisch et al. 2015b). Such management systems shall not be mistaken with CS systems. Such management systems take a narrow perspective on setting and tracking target achievement according to standards while neglecting, e.g., philosophies or policies (Zwetsloot 2003; Baumgartner 2014; Searcy 2012; Nawaz and Koç 2018). In my qualitative research, most companies stressed the need to look at management systems (C1, C2, C3, C5, C7, C8). Management systems turned out as one of the CSM components gaining in attention in practice. For example, the municipality C2 expressed that "management systems seem to gain higher relevance (...), also our customers ask for it". Thus, setting the requirements for such management systems seems to be a larger concern in practice than in current research.

All in all, practices contribute to reaching implemented CS by yielding actionable plans, anchoring them in guidelines and directives as well as in specifications for progress tracking (Maon et al. 2009; Vidal et al. 2015). This is fundamental for anchoring CS in everyday business activities that shape the mindset of people.

4.4.2.4 Processes

The CS system level of processes represents the operational execution of CS engagement (Ostroff and Bowen 2016; Baumgartner 2014)[15]. Executing CS engagement happens at different fields along a company's value chain like product / service development, production, sales, communication, or supply chain management (Mason and Simmons 2014; Baumgartner 2014). Thus, it is not surprising that all investigated companies were active on this CS system level and involved different corporate functions and businesses. As such, companies said that they "pay high attention to technical handling of procedures" (C1), and that they have a variety of management systems in place (e.g., C2, C6, C8).

At the level of CS processes, one has to distinguish between two categories: On the one hand, urgent one-time handling of negative incidents deserves special attention due to potential large adverse effects (Vaaland and Heide 2008; Mobus 2012). Therefore, triggers, measures and teams shall be pre-defined for fast reaction (Vaaland and Heide 2008). However, only few companies had defined such aspects in my study. Only the TSO C6 and O&G company C7 stressed being prepared for urgent incident handling. On the other hand, there are regularly conducted CS processes. All analyzed companies worked on regularly conducted CS processes. Regular CS processes aim at carrying out planned actions, tracking progress and deriving potentially needed corrective actions

[15] CS system processes shall not be confused with a sequence of pre-defined steps, here called procedure. Such procedures may occur at all levels like strategy definition at policies mentioned by Porter and Kramer (2006) or planning at practices described by Baumgartner (2014).

(Wood 1991; Maon et al. 2009; Vaaland and Heide 2008). Therein, continued “operational small improvements make the difference” (C7).

The tracking of progress deserves further elaboration here as next CSM component at the CS processes level. For progress tracking, companies need to define a set of indicators. This is a cumbersome, complex task in itself (Delai and Takahashi 2011; Salzmann 2006). Regardless, progress tracking is seen as essential shown by the fact that most companies already had indicators in place (C4, C5, C6, C7, C8). The others aspired to do so soon (C1, C2, C3). Once indicators have been defined and according data has been gathered, consolidated results are analyzed regularly in progress reviews in top-management meetings, e.g., using “a sustainability radar (...) in a traffic light system” (C2) in order to see “whether we move in the right direction or which additional measures need to be taken” (C4). Also research has stressed the relevance of regular reviews of plan achievement and improvement areas to define corrective actions (Maon et al. 2009; Delai and Takahashi 2011). This also serves as feedback for the other CS system levels, esp. CS practices (Asif et al. 2013).

All in all, CS processes contain CSM components to actually execute CS engagement in different regions, businesses and functions of a company (Baumgartner 2014). Thus, they contribute significantly to reaching implemented CS throughout companies.

4.4.3 Fit

In line with general systems theory, fit does play a major role in systems (von Bertalanffy 1950). Thus, one has to consider fit as an important requirement of an advanced CSM framework (chapter 4.2).

Fit has been stressed as success factor in CSM (Baumgartner and Ebner 2010; Linnenluecke and Griffiths 2010; Yuan et al. 2011). However, empirical evidence on its influence remains limited to perceptions of few external stakeholders (Elving 2013; Becker-Olsen et al. 2006). Although this research stream is in early stage, it already spans various aspects and conceptualizations of fit. Thus, research can benefit from increased conceptual clarity (de Jong and van der Meer 2015; Venkatraman 1989)[16]. The CS system offers such clarity by introducing four types of fit being of relevance at one point in time.

These types of fit are vertical and horizontal coherence within CS systems plus company-internal and -external consistency. Figure 8 illustrates them. I base these types of fit on the scheme by Yuan et al. (2011). I extend it by splitting coherence into two types that are also used in HR systems research (Kepes and Delery 2007; Kehoe 2019). I elaborate on each type's characteristics and role in CSM using the systems perspective.

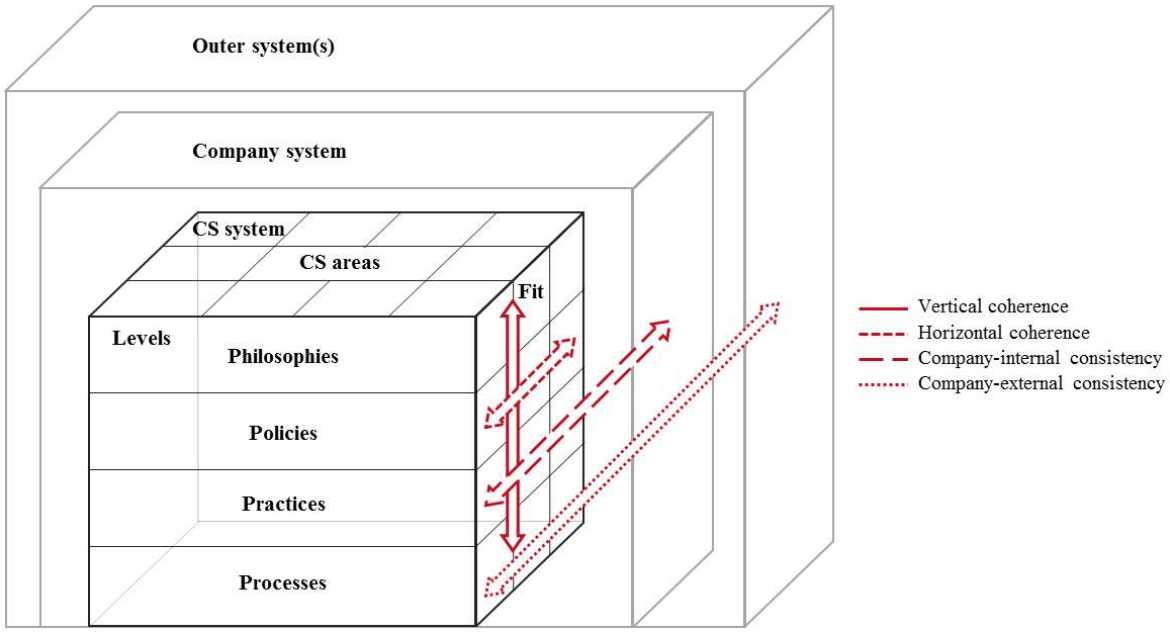

Figure 8: Overview of types of fit (based on Yuan et al. 2011; Kepes and Delery 2007)

[16] Topics to be 'fitted' mentioned by de Jong and van der Meer (2015) are covered in CS areas.

Vertical coherence is fit across CS system levels, either for CS overall or for particular CS areas: Principles shall be reflected in policies' strategic objectives and responsibilities which form the basis for plans and other practices steering the executed actions at the processes level (Baumgartner 2014; Ketola 2008; Kleine and Hauff 2009). This type of fit is commonly implied in step-wise CSM approaches (e.g., Maon et al. 2009) and represents the prominent claim of 'walking the talk' (e.g., Buehler and Shetty 1975; Treviño and Brown 2004). However, it has not been conceptualized and lacks empirical evidence on its influence towards implemented CS. Nevertheless, first qualitative research results revealed adverse impacts on employee motivation and CS engagement in case of missing vertical coherence (Zhao 2004). Underpinning such insights from practice, my qualitative study revealed that companies mainly established vertical coherence using corporate alignment procedures (C1, C4, C5, C7, C8). For example, CS managers at the electric utility C4 "pay attention (...) to set targets, to shape procedures (...) and to measure performance in a way for achieving these targets" (C4). Likewise, the municipality C5 has "corporate values, a strategy, which results in programs (...) [added: being] an on-going work along top-down and bottom-up principles".

As second type of fit, horizontal coherence refers to fit among CS areas and CSM components at each CS system level, at best to resolve tensions or mismatches among them (Hahn et al. 2015; Hengst et al. 2019). As such, long-term efforts in, e.g., climate change mitigation and short-term financial objectives need to be balanced (Hahn et al. 2010). Furthermore, CS-related responsibilities shall follow strategies at the policies level which does not seem to happen in practice (Perera Aldama et al. 2009). Moreover, planned actions and targets are stressed as basis for setting the requirements for progress tracking and according tools at CS practices (Searcy 2012; Schaltegger 2010). Horizontal coherence is not a CSM-specific concept. It has been discussed in organizational research stressing

that successful multi-business companies engage in businesses which match each other and require similar management approaches or capabilities (Teece et al. 1994). In general, CS-related horizontal coherence deserves greater attention by scholars and practitioners. My study revealed that horizontal coherence is widely expected to be secured somehow, but it was not pursued proactively by CS managers, e.g., in C1, C3, C4. Nevertheless, few CS managers in the companies resolved conflicts among CS areas centrally, because they stressed it as "[my; changed: their] job (...) to combine existing initiatives and foster cross-unit topics" (C2). If "contradictions [added: are] not (...) centrally resolved, then every employee would have to solve them individually" (C5). Anyhow, the theoretically understood concept of horizontal coherence was stressed as a highly complex task in practice: "If you want to excel, you can take some trade-offs between People, Planet, Profit; analyze and solve them. (...) Well, I have not yet managed that" (C8). Consequently, scholars need to better address this complexity and aim for developing better guidance with practitioners to reach horizontal coherence.

The third type of fit, company-internal consistency, represents fit between the CS and company system regarding addressed areas and management components used at corresponding system levels (Ulrich 2001; Baumgartner 2014). As such, formulated CS-enforcing values are not as impactful when they contradict the corporate values lived in a company (Mobus 2012; Ketola 2008). Moreover, integrated or at least aligned CS and corporate strategies are emphasized as positive influence in order to get CS implemented (Baumgartner and Ebner 2010; Maruffi et al. 2013). My study's results underpin this claim empirically: Most experts highlighted the advantages of a corporate strategy incorporating CS-related objectives (C1, C2, C3, C5, C8), because "we want to become sustainable as company overall" (C2) and "any other way would serve communication purposes" (C1). Other studies revealed that CS practices and processes that match established coordination

mechanisms in companies facilitate CS implementation (Yuan et al. 2011; Schneider et al. 2014). Thus, it is not surprising that also the investigated companies integrated CS targets from plans into business units' goals (C1, C8) and adjusted work instructions for operational employees to fully reflect CS considerations in tasks (C1, C2, C3, C4, C6, C7, C8). The statement by the CS manager of the O&G company (C7) underlines it well: "These elements need to be embedded in the way we work, in the way we make decisions and in the way we measure our performance and reward employees to actually get sustainability fully integrated."

Company-external consistency demands fit of CS system elements with outer systems. For example, CS-related strategic objectives shall be formulated in light of analyzed business environments (Porter and Kramer 2006; Maon et al. 2009) and external stakeholders expectations (Mason and Simmons 2014). Practitioners seem to follow this recommendation with all energy companies setting their CS-related strategic objectives and priorities of CS areas in light of such company-external contexts. As pointed out by C4: "We have to incorporate environmental, social, economic impacts in our decisions (...) – all those impacts that external stakeholders confront us with". Moreover, the internationally active O&G firm (C7) and the supplier of energy companies (C8) adapted CS processes and actions, because "the external requirement profile for sustainability diverges between different countries" (C8).

Next to types of fit, there are different degrees of fit (Kepes and Delery 2007). My qualitative study was not constructed to investigate this concept. Nevertheless, I introduce the concept of degree of fit to the CS system framework to shed further light on how to achieve desired CS-related outcomes.

For lower (higher) degrees of fit, the CS system elements undermine (complement) each other for reaching CS-related outcomes like implemented CS (Elving 2013; Hahn et al. 2010). CSM research widely implies but does not examine nor verify a positive influence of high degrees of fit. In general, high degrees of fit can occur as additive or synergistic positive fit (Chadwick 2010). Elements showing additive positive fit contribute to CS-related outcomes without overlaps like CS initiatives fostering labor rights and local community involvement and development by employee volunteering (Florea et al. 2013). Synergistic positive fit exists when elements mutually reinforce their impacts by sending overlapping signals like promotional campaigns for employee safety and related trainings (Perron et al. 2006).

This concludes the introduction of a theoretically grounded CS system being refined with insights from practice. The CS system with its CS areas, CSM components along distinct levels and the influencing role of fit offers relevant contributions which are discussed next.

4.5 Discussion

This paper advances our understanding on successful CSM towards implemented CS as established mindset throughout a company to run the business sustainably. Implemented CS is seen as basis for reaching desired performance impacts (Lindgreen et al. 2009b; Mosher and Smith 2015). I extend the existing theoretical basis by applying general systems theory (von Bertalanffy 1950) as well-suited background to capture CS as complex construct (Córdoba and Campbell 2008; Starik and Kanashiro 2013). In particular, I transfer insights on HR systems as comparable concept (Huselid 1995) to develop the CS system. Furthermore, I substantiate the theoretically derived CS system concept with new insights from a qualitative study. I conducted multiple case study

research of eight companies connected to the energy sector which are regarded as successful in managing CS.

The CS system clarifies CS areas to be addressed, and contains CSM components along distinct levels that contribute to reaching implemented CS. The CS system allows capturing CS, its influences and impacts at institutional, company, and individual level (Starik and Rands 1995; Chofreh and Goni 2017). Moreover, it captures fit among CS system elements and outer influences or impacts.

The ten provided CS areas are more concrete, comprehensive and self-explanatory than the three CS dimensions usually referred to in CSM research. The CS areas are derived from well-known, practice-oriented CSM instruments (Chofreh and Goni 2017; ISO 2016; GRI 2013b; UN 2014). This eases the application of derived CS areas in practice. For each company, the CS areas shall be analyzed and prioritized to cover all three CS dimensions and focus on a scope that the company can handle.

Furthermore, the CS system offers a comprehensive structure of CSM components along the levels of philosophies, policies, practices and processes. Each of these CS system levels has its unique purpose, and they match the levels established in company management research (Ulrich 1984; Loorbach et al. 2009; Posthuma et al. 2013). My qualitative study highlights that philosophies are least proactively shaped in practice. The reason does not seem to be a lack of awareness of the relevance of CS-oriented corporate values. There is rather a lack of long-term focus, resources and clear guidance on how to shape CS philosophies. In contrast, shaping CS philosophies with a strategy and formalized CS responsibilities is well-captured in research and common in practice. The study's results also underline that CS practices with clear targets and measures in form of plans are

a common component to manage CS. Moreover, there is a rising relevance of management systems in practice covering the CS processes level, too.

Last but not least, the CS system elaborates types and degrees of fit. My qualitative study is among the first ones to offer empirical evidence for fit in CSM. Overall, fit seems to be worked on less proactively than CS areas or CSM components in practice. Regardless, practitioners address vertical coherence intuitively using established alignment procedures from strategic objectives to plans and progress achievements. Likewise, company-internal and -external consistency are aimed to be reached, esp. by aligned CS and corporate strategies or reflected external expectations on CS areas.

Based on this reasoning, the CS system meets all requirements stated in past research (see section 4.2). Thus, it can be seen as the long-demanded, advanced CSM framework (Margolis and Walsh 2003; Lindgreen et al. 2009b).

The CS system framework paves the way for promising future research avenues.

First of all, some elements in the CS system deserve further attention. In particular, CS philosophies need to be better captured to stress their important role for guiding behavior throughout companies. Moreover, future research is encouraged to elaborate on specific components and how to establish them as CS philosophies. Regarding CS practices, scholars shall better reflect the learning from practice that targets and plans have to be cascaded down to clear work instructions at operational level. Moreover, the rising relevance of management systems in practice is a relevant insight for scholars to help practitioners in setting them up correctly for CS-related progress tracking to reach implemented CS as mindset (not only performance impacts). Moreover, fit and how to manage it has to gain relevance in research in order to better guide practitioners.

Secondly, it is crucial to substantiate our understanding on how *CS* gets *implemented* successfully (Lindgreen et al. 2009b). On the one hand, scholars can better explain and empirically test the contributions of CSM components at the distinct CS system levels for achieved CS implementation. As part of these efforts, related research gaps can be closed. So far, past studies have only provided empirical evidence on contributions of CS-related practices and processes towards implemented CS (Helmig et al. 2016; Schneider et al. 2014). Instead, almost no insights exist on how CS-related philosophies really shape mindsets of managers and employees. To address this gap, scholars may continue to combine HR and CS research as mutually supporting fields, e.g., for capturing micro-foundations as individual traits (Aguinis and Glavas 2012) or religious influences (Maon and Lindgreen 2015; van Buren et al. 2016). Furthermore, additional explanation and evidence is encouraged for the contributing role of clear, ambitious strategic objectives (Baumgartner and Ebner 2010) and defined responsibilities (Perera Aldama et al. 2009). On the other hand, the CS system underlines the relevance of addressing material CS areas for a company (Chofreh and Goni 2017; Kleine and Hauff 2009). For doing so in the best manner, CSM components are tailored to each CS area along the CS system levels. This finding from my qualitative study suggests deeper investigations of CSM of particular CS areas in order to highlight their unique and joint contributions for implementing CS.

Thirdly, the CS system allows progressing discussions on *CS-related performance impacts*. The CS system with its areas and components along different levels helps to illuminate the black box towards CS performance and eventually corporate performance in a structured manner (Margolis et al. 2007; Wood 2010). Moreover, non-linear relationships (Steger et al. 2007) could be explained by the dynamic of CS systems that interact with surrounding systems.

Fourthly, scholars may verify their claims on *influences* for achieving implemented CS and performance impacts: As such, holistic (rather than selective) CSM is said, yet unproven to be decisive (Mason and Simmons 2014; Wood 1991). The CS system elucidates what *holistic CSM* actually entails: Holistic CSM addresses relevant CS areas for a company by covering CSM components at all four CS system levels while considering influences from other systems at the institutional, organizational and individual level. This conceptual clarity sets the stage for scholars to examine really achieved outcomes from holistic compared to selective CSM. Furthermore, *fit* of CS system elements among each other to other systems plays a role (Yuan et al. 2011). Scholars are encouraged to examine the role of each of the introduced four types of fit being vertical coherence, horizontal coherence, company-internal and -external consistency. For doing so, scholars need to choose adequate, not most convenient research methods. Methodological advice for testing types of fit can be found in Venkatraman (1989) whose elaborations on configurations are valid for vertical / horizontal coherence, and covariation and matching correspond to company-internal and -external consistency. Additionally, Chadwick (2010) points out methodological procedures for examining degrees of fit like advanced factor analyses for synergistic positive fit or analysis of variance for additive positive fit.

Fifthly, the CS system emphasizes the need to adjust CS engagement to a specific company given its unique context by prioritizing CS areas and CSM components. This hints to the equifinality of CSM. Equifinality means that the "same final state may be reached from different initial conditions and in different ways" (von Bertalanffy 1950, p. 40). Scholars are encouraged to provide further evidence on equifinality of CSM using longitudinal studies of companies which can be compared. In this realm, it would also be

interesting to see whether certain CSM components and CS areas prove to be standard CSM elements and by which means CS-related differentiation takes place.

Last but not least, this paper faces some limitations marking starting points for future research, too. A longitudinal study could shed light on flexible fit in CSM over time, because I focused on types and degrees of fit at one point in time only. Moreover, I relied on examining CSM of selected energy companies in the European Free Trade Association. Additional research may investigate whether the CS system applies equally well to other contexts and whether more granular guidance for different regions and / or sectors is needed. Naturally, any illustration and explanation of a system cannot outline all elements and their interactions (Ulrich 2001). Thus, future research may extend my work on CS areas and CSM components at the four levels.

Moreover, the CS system offers several insights for successfully managing CS in practice. Most importantly, it provides a comprehensive view on potentially relevant and interlinked areas and management components for implementing CS throughout a company.

Next to this overall guidance, the CS system also facilitates company-specific decisions that practitioners need to take, e.g., on which CS areas to prioritize and which CSM components to use. For prioritizing CS efforts, the list of commonly stated CS areas helps creating clarity beyond the three rather generic CS dimensions. Additionally, the CSM components are structured according to their purpose along CS system levels. They span overall guidance (philosophies), direction in terms of objectives and responsibilities (policies), specific plans and requirements (practices), and execution (processes). At best, companies utilize a set of CSM components spanning all these levels to leverage their distinct purposes for implementing CS as basis for achieving performance impacts. This

approach constitutes the widely demanded *holistic* CSM (Starik and Kanashiro 2013; Ketola 2008).

Furthermore, it is worth noting that each of these levels affects and is shaped by mainly one company management level which is mostly in charge of handling these CSM components: Normatively managing behaviors using philosophies is a top-management tasks to eventually reach everyone in a company. Strategic management of policies is usually done by an extended team of top-managers, and people heading businesses, key functions or regions. Mid-managers are crucial for specifying CS-related practices as preparation for the execution as CS processes by operational managers and their team members.

Moreover, practitioners are encouraged to pay larger attention to the crucial role of fit in a company's CS engagement. For example, CS areas shall be prioritized and strategic objectives defined by a company that correspond well with stakeholder expectations, business environments, and overall business conduct. Additionally, CS-related philosophies, policies, practices and processes need to match each other in order to 'walk the talk'. Companies that neglect such fit end up sending misleading signals to company-internal and -external stakeholders which increases skepticism against the truthfulness of CS engagement and may even result in boycotts.

4.6 Conclusion

This paper advances our understanding of how CS engagement shall be managed to implement it as basis for reaching desired performance impacts. In particular, I propose to treat CS as a system. The CS system compared to previous CSM frameworks yields potentially richer explanations on CS areas to address, CSM components to use and influences to consider like fit. It is based on general systems theory, esp. HR systems, that I

enriched with findings from a qualitative study on managing CS successfully in companies connected to the energy sector. Thus, the CS system as advanced CSM framework guides practitioners in enhancing their CSM efforts and illuminates promising resulting research avenues for scholars.

5 Increased corporate environmental performance: The role of holistic management and fit

by Stefanie Priemer

Abstract

This study examines determinants of superior corporate environmental performance using a dataset of 147 European companies in different industries. Taking a systems perspective, it is argued that holistic corporate environmental management utilizing components at philosophies, policies, practices and processes as well as components' coherence and consistency to other company management components matter for increased environmental performance. Results indicate that a holistic rather than selective approach is positively associated with increased environmental performance. Furthermore, this association is moderated by company-internal consistency.

5.1 Introduction

Not just since the so-called Paris Agreement do we know that tremendous worldwide efforts are needed to limit global warming to two degrees Celsius for preserving our planet (UN 2016). The corporate sector plays a key role in achieving this objective (Walker et al. 2015; Bansal and Roth 2000). In fact, scholars and practitioners have worked on corporate environmental management (CEM) since the 1980s (Kolk and Mauser 2002; Bansal and Song 2017).

Environmental engagement is one of the corporate sustainability (CS)[17] dimensions to be managed. The achieved outcomes of CEM have been extensively assessed on both, corporate environmental performance (CEP) and eventually financial performance (Albertini 2013). CEP is understood as the degree of achieved effects of a company's activities, and its products, services, solutions on the natural environment (Klassen and Whybark 1992). Research reviews revealed an overall positive relationship between CEP and financial performance (e.g., Dwyer et al. 2009; Horváthová 2010). However, the determinants of CEP remain weakly understood until today (Schultze and Trommer 2012; Lannelongue et al. 2014).

This study sheds light on CEP determinants. Practitioner-oriented studies show that companies with high CEP utilize several CEM components jointly like redirecting business models, shaping cultures and adjusting production procedures (Mosher and Smith 2015). Likewise, conceptual research repeatedly emphasizes that holistic CEM is key to obtain increased performance (Margolis and Walsh 2003; Starik and Kanashiro 2013; Baumgartner 2014). Nevertheless, empirical studies cover only selected CEM components, esp. strategies and actions (e.g., Sharma and Vredenburg 1998; Aragon-Correa and Sharma

[17] Given the close connection between CS management (CSM) and CEM, literature on CSM is considered as applicable for CEM, too.

2003; Ortiz-de-Mandojana and Bansal 2016). I provide first evidence on the linkage between holistic CEM and increased CEP.

For doing so, I apply a systems perspective. In fact, CEM research is rooted in general systems theory stressing companies' interdependence with the natural environment as basis for their joint survival or downfall (e.g., Gladwin et al. 1995). However, CEM research applying systems theory at company-level remains scarce (Bansal and Song 2017; Starik and Kanashiro 2013). I take this research path, because it seems particularly fruitful for capturing the real-life complexity in CEM with the great variety of dynamic, interconnected components (Lindgreen et al. 2009b; Schultze and Trommer 2012).

In order to reflect and handle such complexity in a structured manner, I proposed the CS system (chapter 4). This CS system contains a sub-system for environmental areas which I will hereafter call environmental system (ES). The CS system as well as the ES are based on general systems theory (von Bertalanffy 1950; Ulrich 2001). In particular, I apply knowledge from HR systems as comparable, well-established construct that was mainly shaped by the seminal work of Huselid (1995). As a main claim of HR systems it is crucial to not consider single but the whole combination of HRM elements for reaching desired outcomes (Huselid 1995). This holism claim seems very valid for CSM, too, and shall be further examined in this paper. I will elaborate on other transferrable aspects from HR research to CEM research in section 5.2.1. In general, the ES reduces, prevents, and rectifies adverse impacts on the natural environment in the short- and long-term (chapter 4; Bansal and Roth 2000; Dahlsrud 2008). Thus, CEM covers all efforts undertaken to shape an ES.

In the present paper, I argue that the ES helps clarifying what holistic CEM means, namely covering CEM components at all levels of the ES. This allows empirical tests of

whether holistic CEM is associated with higher CEP – a claimed, but yet untested hypothesis in research.

Additionally, I can utilize the ES to examine another widely claimed yet insufficiently tested performance determinant: Fit (Venkatraman 1989; de Jong and van der Meer 2015). Case study research has revealed that fitted CEM components lead to enhanced outcomes (Vidal et al. 2015; Yuan et al. 2011). Similarly, theories suggest its influence: General systems theory says that aligned components transform inputs more efficiently into outputs (Ulrich 1984; Delery 1998). The resource-based view (RBV) states that company-tailored inimitable as well as complementary resources are the basis for competitive advantages (Christmann 2000; Hart 1995). Despite such strong assertion for fit, past research insufficiently distinguishes between types of fit and lacks empirical evidence on its real influence (Venkatraman 1989; de Jong and van der Meer 2015). This study addresses these gaps by assessing a potential moderating role between CEM and CEP for two types of fit: Vertical coherence (fit across the ES levels) and company-internal consistency (fit of CEM components to respective company management components).[18]

Results underpin that holistic CEM is associated with higher CEP, and that company-internal consistency partially and positively moderates this association. Regarding vertical coherence, no evidence on theoretically grounded influences on the linkage between CEM and CEP is found by this study being the first one to explore this relationship.

All in all, the paper offers important contributions to research and practice: It provides first evidence that holistic, rather than selective CEM drives higher CEP. This marks a

[18] I chose these types of fit, because they were emphasized as important types of fit by practitioners interviewed in my qualitative study (chapter 4). In contrst, horizontal coherence was very hard to grasp by practitioners which may hamper its high-quality measurement. In contrast, company-external consistency has already been largely discussed in research and practice, e.g., by addressing stakeholder interests. Thus, new research insights may be limited – in any case, clear measurement may still advance our understanding of company-external consistency.

cornerstone for applying general systems theory in this research field. Likewise, it strengthens managers in fostering environmental philosophies, policies, practices and (not: or) processes to achieve increased CEP and in turn, financial performance. Moreover, the revealed partial support for the moderation by company-internal consistency between CEM and CEP encourages attention on the influences of fit. Despite insignificant results for vertical coherence, I set a starting point for further investigations of this influence, too.

For achieving these contributions, the paper firstly outlines the theoretical background and derives hypotheses. Then, the methodology and results are described. Eventually, I discuss the results in light of past research, elaborate on implications and conclude with this study's limitations as basis for future research.

5.2 Background and hypotheses

General systems theory has been commended as well-suited to holistically capture complexities in CEM and its outcomes (Córdoba and Campbell 2008; Starik and Rands 1995). This study is based on the following assumptions in general systems theory: Phenomena are treated as systems like corporate environmental engagement and the company itself (von Bertalanffy 1950). A system is a set of interdependent elements (ibid.), here environmental areas and CEM components. Elements are dynamic in order to turn inputs into outcomes (von Bertalanffy 1950). Different sets of elements and starting points exist for eventually reaching the same system outcome (ibid.). To understand system outcomes, holism instead of reductionism is important (Ulrich 1984). This means that the whole system achieves larger output than the sum of its elements (ibid.). Furthermore, systems are both, open and closed (Luhmann 1984; Ulrich 1984). They are open to stay in exchange with their surrounding systems. They are also closed in the sense that they can be clearly distinguished from another. Moreover, systems contain so-called structural parts

being stable (not static) against short-term changes (Parsons 1951). Indeed, environmental and company systems do not alter instantly when outer systems change like regulations or competitive pressures (Poisson-de Haro and Bitektine 2015; Delmas et al. 2007b). Thus, some structural parts seem to exist which can be shaped over time – an effort undertaken by corporate (environmental) management (Parsons 1951; Ulrich 1984).

I based the ES like the CS system, which spans also non-environmental CS areas, on HR systems. HR systems have been mainly shaped by the seminal work by Huselid (1995). HR systems have become well-established in HR research (Ostroff and Bowen 2016). It is possible to transfer insights on HR systems to systems for CS and environmental engagement, because managing HR, sustainability and environmental engagement have been found to require similar approaches and to mutually support each other in reaching their objectives (Voegtlin and Greenwood 2016; Jamali et al. 2015; Morgeson et al. 2013).

Transferable insights show that dedicatedly managing HR systems (not single elements) at company level is decisive for reaching performance impacts (Huselid 1995; Becker and Huselid 1998). This entails addressing different HR-related areas with the help of a set of HR management components. These management components are grouped to four levels being philosophies, policies, practices and processes with their unique purpose to address HR-related areas. These levels also match company management levels (Ostroff and Bowen 2016; Posthuma et al. 2013). Moreover, fit within HR systems and to other systems like companies has been stressed as decisive for achieving desired impacts (Kepes and Delery 2007).

Before I elaborate hypotheses, it is worth stressing that an ES shall not be mistaken with an environmental management system as specified, e.g., in the standard ISO 14001. An environmental management system takes a more narrow perspective on setting and

tracking target achievement (Zwetsloot 2003; Searcy 2012). Therefore, an environmental management system has to be seen as one of many components of an ES.

In the following, I will outline this and other composing elements of ES, their relevance and potential impacts in order to derive hypotheses.

5.2.1 ES levels and CEP

General systems theory, HR systems and past CEM research suggest that each ES level contributes to an increase in CEP in its distinct way.

At the first level, *philosophies* serve as guidance (Kepes and Delery 2006) by encompassing components like codes of conduct, values, corporate cultures (Baumgartner 2014; Linnenluecke and Griffiths 2010). ES philosophies foster environmental protection and, when lived, act as normative anchor for business decisions and managers' and employees' behaviors (Mosher and Smith 2015). ES philosophies were revealed to create understanding on what is preferable leading to increased commitment and thus, better addressed environmental effects as CEP (Yazdani and Murad 2015; Übius and Alas 2009).

Secondly, *policies* outline what shall be achieved (Ostroff and Bowen 2016). They mainly encompass strategic objectives plus structures and responsibilities (Baumgartner 2014; Porter and Kramer 2006). Clear objectives and responsibilities allow turning inputs into desired outcomes more efficiently (Ulrich 2001). Outlining strategic objectives for environmental engagement entails to reflect upon environmental issues and to specify related short-, mid-, long-term goals. This helps managers and employees to prioritize their work for reaching these goals as basis for larger CEP (Mosher and Smith 2015). In the same vein, a strategic CEM approach obtained better results in past studies than a reactive or defensive approach (Aragón-Correa 1998). Furthermore, clear and company-wide

structures and responsibilities were found to facilitate environmental goal achievement (Pedrini and Ferri 2011; Dangelico 2015). Not only do structures and responsibility clarify whom to approach for fostering CEM, but they also establish accountability – a driver for increased environmental engagement (Vidal et al. 2015).

Thirdly, *practices* specify what shall be done how by whom (Posthuma et al. 2013; Ostroff and Bowen 2016). Typical examples are plans with broken-down goals to units / regions, resource allocation rules, procedural guidelines as well as measures for constant improvement like audits or benchmarks (Azapagic 2003; Baumgartner 2014; Qian et al. 2018). ES practices weave a more granular network of components thanks to more actionable tasks, clarified end products and milestones per responsible who know which resources they may use (Ulrich 1984). Past research stressed that unclear goal breakdowns and insufficiently, inefficiently allocated resources are impediments to successful environmental initiatives (Ervin et al. 2013). Instead, clear procedural guidelines were found to clarify everyday work on environmental engagement and to yield better results (Asif et al. 2013; Jiang and Bansal 2003).

As fourth level, *processes* regard to executed actions for turning ES inputs into outcomes, here CEP (Baumgartner 2014). Following past CEP research, I focus on four action fields at the processes level. These are products and services, human resources, communication and progress tracking (e.g., Aragón-Correa 1998; Ramus and Steger 2000; Schultze and Trommer 2012). For example, 'green' products caused less threats to the natural environment along their lifecycle leading to enhanced CEP (Albino et al. 2009). Similarly, a trained workforce knowing environmental risks could better prevent, and when needed rectify adverse impacts (Aragón-Correa 1998). Managers' attention on working towards achieved environmental objectives was found to increase thanks to regular

progress reviews (Schultze and Trommer 2012) as well as payment structures incl. environmental targets (Deckop et al. 2006). Last but not least, communicating environmental objectives, norms, or first achievements within a company increased environmental engagement of managers and employees (Ramus and Steger 2000). In contrast, insufficient communication on really conducted environmental engagement fostered company-internal resistance as well as external mistrust (Chaudhri 2016; Slack et al. 2015).

Each of the ES levels is argued to contribute to CEP. Additionally, this study examines the combined contribution of ES levels as holistic impacts of CEM to CEP. This way, I can bring advanced insights from renowned work on company (Ulrich 2001) and HR systems (Huselid 1995) into the still infant research on ES. According to Huselid (1995), an isolated examining, e.g., of practices leads to biased results for overall performance impacts of HRM. Instead, the combined impact of interdependent system levels and their components shall be examined. In total, the ES levels help clarifying which behavior is expected (philosophies), what shall be aimed at by whom (policies) and which actions are to be conducted (processes) along specified plans and procedures (practices).

Existing empirical research offers initial support for such assertions about the ES and holistic CEM. For example, a combined establishing of environmental policies, standardized procedures and a certified environmental management system led to larger CEP (Link and Naveh 2006). Moreover, proactive strategic objectives and undertaken prevention rather than pollution reduction activities characterized companies as environmental leaders (Sharma and Vredenburg 1998; Buysse and Verbeke 2003). Consequently, I follow repeatedly raised claims in conceptual research that holistic CEM matters for driving performance (e.g., Starik and Kanashiro 2013).

Summarizing these arguments, I suggest the following hypothesis.

H1: Systematic, holistic CEM is related to higher CEP than selective CEM. This is the case when the majority of a) philosophies, b) policies, c) practices and d) processes showing higher environmental engagement is positively associated with CEP than the minority.

5.2.2 Moderating influence of vertical coherence

Vertical coherence means that components across ES levels interact in a reinforcing manner in order to better transform inputs into outcomes (von Bertalanffy 1950; Kepes and Delery 2007). It represents the frequently demanded 'walking the talk' by reflecting environmental philosophies in the other levels, e.g., as strategic objectives, derived plans and undertaken actions (Maon et al. 2009; Azapagic 2003). Likewise, feedback loops between components at ES levels were emphasized, e.g., for refining responsibilities or procedural guidelines to smooth execution of environmental activities (Asif et al. 2013; Starik and Kanashiro 2013). Past case study research derived vertical coherence as success factor (Vidal et al. 2015). Additionally, company reports showing vertical coherence obtained higher quality evaluations which led to increased CEP in third party ratings (Mio 2010; Herbohn et al. 2014).

The theoretical basis and first empirical evidence look promising. However, not all ES levels were considered in previous studies. Furthermore, existing research commonly assumed vertical coherence at high ambition levels. It remains doubtful whether vertical coherence at lower environmental ambition levels positively affects CEP.

At this exploratory research stage, I suggest a positive moderating influence (Venkatraman 1989; Baron and Kenny 1986).

H2: A larger vertical coherence positively moderates the association between corporate environmental engagement along a) philosophies, b) policies, c) practices, d) processes, and higher CEP (and vice versa).

5.2.3 Moderating influence of company-internal consistency

Company-internal consistency means that components of the ES interact well with components in a company system (von Bertalanffy 1950; Kepes and Delery 2007). First support for its relevance is available from qualitative research (de Jong and van der Meer 2015; Yuan et al. 2011). However, these studies examining company-internal consistency focused on the processes level only[19].

In this study, company-internal consistency is argued to be a relevant influence between CEM and CEP at other ES levels, too. This claim is based on the following available findings: For philosophies, corporate values being consistent with a company's commitment to environmental protection enhanced performance (Fairfield et al. 2010). Looking at policies, corporate strategies incorporating environmental strategies increased CEP (Buller and McEvoy 2016). Furthermore, Buysse and Verbeke (2003) found that companies going beyond reactive approaches integrate environmental issues in their planning process, covering the practices level.

The core argument is that larger company-internal consistency shows environmental engagement not just as add-on but as part of core business (Weaver et al. 1999). Thus, company-internal consistency in its purest form means that a CEM component is integrated

[19] The term 'practices' is used differently in these papers and regards to "decision making and action" as stated by Yuan et al. (2011, p. 75). In this meaning, the ES covers it at the processes level.

in company system management components being "central to the organization's survival" (Yuan et al. 2011, p. 78). Consequently, greater company-internal consistency can be expected to foster managers' and employees' environmental attention and ambitions to minimize adverse environmental effects (Maon et al. 2009; Weaver et al. 1999).

In the opposite way, low company-internal consistency was revealed to increase skepticism among company's stakeholders (Elving 2013).

Summarizing these arguments, company-internal consistency is expected to serve as a moderating influence (Venkatraman 1989; Baron and Kenny 1986).

H3: A larger company-internal consistency positively moderates the association between corporate environmental engagement along a) philosophies, b) policies, c) practices, d) processes, and higher CEP (and vice versa).

The hypotheses are summarized in figure 9.

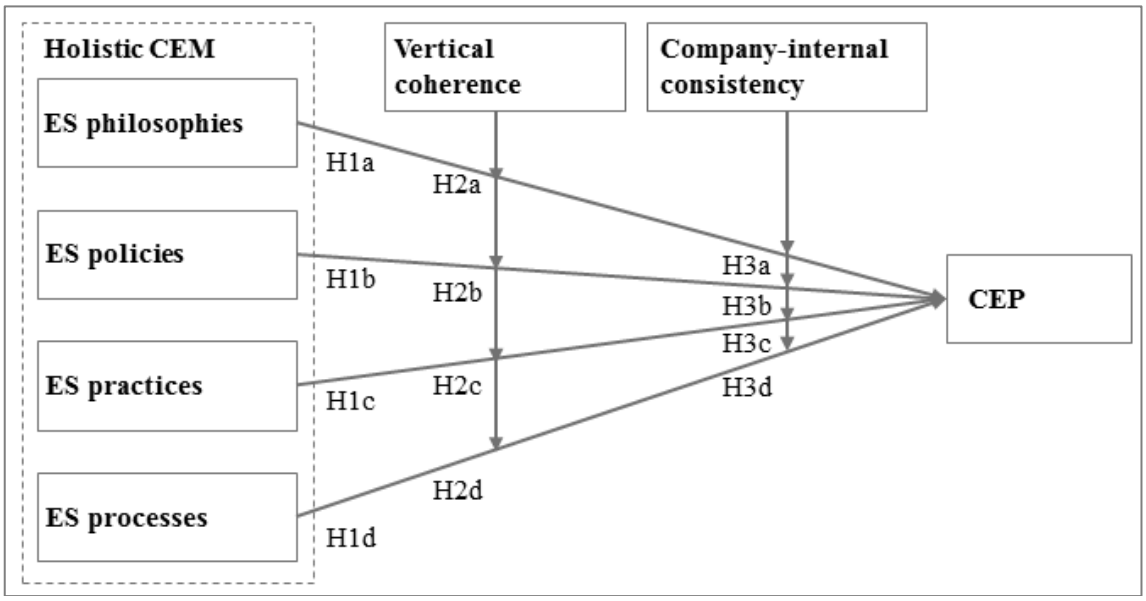

Figure 9: Research model

5.3 Methodology

In section 5.2, I outlined the ES concept based on HR systems being widely shaped by the seminal work of Huselid (1995). Thus, I will mention common and deviating research methodologies compared to his work where applicable during the following sections.

5.3.1 Data collection and sample

To test hypotheses, data from three data sources was combined for a sample of 147 large, public European companies being active in CEM.

The sample was identified as follows: Initial screening criteria required companies to be large with at least 250 employees (European Commission 2017), to be public and to be headquartered in Northern or Western European countries in fiscal year 2015. This ensured similar national environmental policies and corporate characteristics for cross-company comparisons (Steurer and Hametner 2013). To enhance generalizability of results, companies should stem from different industries (Maignan and Ferrell 2000). The cross-industry coverage was also preferred by Huselid (1995) for investigating the impact of systems. I used Thomson Reuters EIKON for the industry screening. Additionally, I screened companies for their activity in CEM by means of a recent oekom corporate rating (oekom 2016a). The resulting population spanned 774 companies. I needed specific insights on CEM components used by companies – just like Huselid (1995) needed insights on HR system components which he gathered with a questionnaire. To obtain insights on CEM components and the resulting final sample, I administered an online survey to the population of 774 companies between March and April 2017. I sent the survey either directly to CS coordinators and environmental managers, or to other contacts who forwarded the survey company-internally. The contacted 996 potential respondents were identified in an extensive web-based search and phone-based verification procedure.

As a result, respondents can be seen as key informants for constructs in this study (Huber and Power 1985). Each of them received an e-mail explaining the study, ensuring confidentiality and providing the link to the online survey. The follow-up process included phone calls and e-mails two and four weeks after initial contact. Eventually, 168 persons started and 159 of them completed the survey covering 147 companies as sample of this study.

The different number of respondents and companies is caused by multiple respondents for 12 companies. I aimed at obtaining multiple responses to limit potential measurement errors from single responses (Gerhart et al. 2000). However, relying on single respondents has not only proven more feasible but also equally objective as combined multiple responses, esp. when key informants answer question at company level (Becker and Huselid 2006). These conditions were met here. To further verify that single response bias was no severe issue, I adopted the procedure by Sharma and Vredenburg (1998) and compared multiple responses per survey item. Results show no significant differences for any of the items. Thus, I included average values in my analysis for each of the 12 companies having multiple responses.

A sample of 147 companies results in a response rate of 19%. That is comparable to related studies (Sugita and Takahashi 2015; Ramus and Steger 2000) and online surveys used in social sciences with extensive contact and follow-up procedures (Manfreda et al. 2008; Fan and Yan 2010).

Table 8 summarizes sample information. 56% of companies are active in industries producing and distributing capital goods, materials and energy, as well as in transportation. 54% have engaged in CEM for more than 12 years. Looking at respondents, support is

found for their key informant role. Most of them are active in environmental or CS management (88%) and have worked for their company for more than 4 years (83%).

Sample information: Companies	n = 147	
Industry		
Capital Goods	33	22%
Materials	18	12%
Utilities	12	8%
Energy	9	6%
Transportation	11	7%
Food, Beverage & Tobacco	7	5%
Pharmaceutical, Biotechn., Life Science	7	5%
Consumer Durables & Apparel	6	4%
Other[1)]	44	30%
Country of headquarter		
Germany	43	29%
United Kingdom	29	20%
Switzerland	23	16%
Denmark	18	12%
Austria	16	11%
Republic of Ireland	6	4%
Netherlands	6	4%
Other[2)]	6	4%
Size (no. of employees)		
250-2,499	22	15%
2,500-14,999	53	36%
15,000-49,999	45	31%
50,000-99,999	11	7%
100,000 and more	16	11%
CEM experience		
1 = 0-3 years	7	5%
2 = 4-7 years	27	18%
3 = 8-11 years	34	23%
4 = 12-15 years	32	22%
5 = More than 15 years	47	32%

Sample information: Respondents	n = 159	
Gender		
Male	85	53%
Female	64	40%
Not provided	10	6%
Tenure		
Less than 4 years	17	11%
4-9 years	54	34%
10-15 years	51	32%
16-20 years	14	9%
21 years or more	13	8%
Not provided	10	6%
Position level		
Chief executive level	1	1%
Senior management level	34	21%
Middle management level	56	35%
Team management level	45	28%
Not provided	23	14%
Main task		
Corporate Sustainability	87	55%
Environment (Health, Safety)	52	33%
Public Relations, Communications	10	6%
Quality Management	3	2%
Strategy, Business Development	2	1%
Finance, Accounting, Controlling	2	1%
Other[3)]	3	2%

Table 8: Sample information (hints: 1) Automobiles, Banks, Commercial Services, Consumer Services, Diversified Financials, Food and Staples Retailing, Health Care, Household and Personal Products, Insurance, Media, Real Estate, Retailing, Semiconductors Telecommunication Services; 2) Belgium, Luxembourg, Norway; 3) Logistics, Supply Chain Management, Operations)

5.3.2 Measures

This study relied on previously used and validated measures when possible. The few exceptions are explained below. Appendix 4 shows all constructs, their measurement items, respective sources plus reliability and validity indicators[20].

Following the guidelines by Jarvis et al. (2003) on non-interchangeability of items and Diamantopoulos and Winklhofer (2001) on causal priority, I used formative measurements for ES levels and other constructs. In contrast, Huselid (1995) used a reflective scale for the HR system components. Reflective scales were the most common, but they were not always the correct approach (Jarvis et al. 2003). These two ways of forming measurements of constructs also require distinct measurement model assessments (see more in Hair et al. 2017). Therefore, my methodology for constructing and assessing measures deviates from Huselid (1995).

My formative measures for multidimensional constructs meet the recommended reliability and validity criteria (Hair et al. 2012b). One exception deserves explanation: Convergent validity could not be assessed using redundancy analysis. The reason is that no established reflective scale or global single item for ES levels, vertical coherence and company-internal consistency was available in the still maturing research field. Instead, I aimed at convergent validity by clearly defining all constructs and selecting measures and their sub-ordinate items to fully cover each construct after extensive research review and expert consultation (Churchill 1979).

Overall, secondary data could be used for the construct CEP as dependent variable and most control variables. Primary data from the survey was used for measuring the remaining

[20] Results are shown for an initial base model without any moderation. However, the recommended thresholds are also met by all moderated models. Results are available upon request.

variables. For the survey-based items, a common understanding by respondents and practicality in data collection had to be balanced. Thus, the survey was offered in English and German as the most common languages in screened companies. To ensure both survey versions measured what they were intended to measure, the survey was translated, and construct validity was verified after a backward translation together with an independent linguist. Both versions of the survey are provided in appendices 4 and 5. Last but not least, items were reviewed by three CEM practitioners not being part of the targeted respondents as well as by an expert for statistics. Phrasing of existing measurement items was adapted to commonly refer to the respondents' company in the survey and to reflect the environmental area of CS.

5.3.2.1 CEP

To measure CEP, I used the environmental rating by oekom research AG evaluating companies along a continuous scale from D- (lowest) to A+ (highest) (oekom 2016a).

This is in line with an increased use of third party ratings in the research field for enhanced replicability of studies and cross-company comparisons (Gama Boaventura et al. 2012; Schultze and Trommer 2012). However, prominent ratings, esp. KLD index, Asset4 index and partly also DJSI were criticized for intransparent methodologies, dependence on company-provided data (Windolph 2011), systematic measurement errors (Carroll et al. 2016), and non-converging results across different ratings before 2010 (Chatterji et al. 2016). Thus, choosing an appropriate rating is an important task. After profoundly comparing existing ratings, the environmental rating by oekom research AG is seen as best choice for this study. First of all, it is one of the most credible and transparent ratings according to broad, independent surveys among CS experts conducted by GlobeScan, and SustainAbility (Sadowski 2013) and econsense (Schröder 2017). Secondly, examined

criteria cover the levels of the ES well (oekom 2016b). Thirdly, it was commended for its sophisticated methodology using several data sources, an industry-specific evaluation approach and a wide coverage of large European companies (Rahdari and Anvary Rostamy 2015; Sadowski 2012). Consequently, previous research studies have already applied it. These papers also offer in-depth descriptions of the criteria and rating procedure used in the environmental rating by oekom research AG (e.g., Schreck 2011)[21].

5.3.2.2 ES philosophies, policies, practices, processes

I decided to measure philosophies, policies, practices, and processes in four separate measurement models rather than constructing a higher-order model for ES. First, analyzing an overall ES association with CEP would have limited insights, because single levels' linkage to CEP and their influence by fit would have been concealed. However, exactly such granular insights are needed at the exploratory stage of CEM research taking a systems perspective. Secondly, it remains unclear how to appropriately estimate formative-formative higher-order models which may risk confounded interpretations (Ringle et al. 2012; Becker et al. 2012).

Consequently, I measured the four ES levels, particularly using 3 items for philosophies, 5 items for policies, 4 items for practices, and 8 items for processes (see appendix 4 for details). For philosophies, policies and practices, respondents were asked to rate the extent to which items hold true for their company using a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). To better reveal differences between companies

[21] The oekom rating considers the following aspects in its environmental rating: Environmental management systems, climate change strategy, travel / transport, suppliers, products and services (e.g., sustainable fuel mix, wastewater treatment), eco-efficiency (e.g, energy use, greenhouse gas emissions).
In its social rating, the following is considered: Staff (e.g., equal opportunities, work-life balance) and suppliers, society (e.g., human rights, stakeholder dialogues) and product responsibility, corporate governance (e.g., executive compensation) and business ethics. The oekom rating applies industry-specific weights to the environmental and social areas. Moreover, controversial activities are indicated and excluded according to exclusion criteria.

at processes, experts recommended using tailored scales. For example, respondents were asked to choose the best-suited option of 5 possible answers (5 being highest) to complete statements like 'Periodic environmental audits are conducted... 1 = ...not at all., 2 = ...for the company overall., 3 = ...for few sites., 4 = ...for the majority of sites that have a large environmental impact., 5 = ...for all sites that have a large environmental impact.' or to indicate the frequency of company-internal communication (1 = not at all, 2 = at hiring, 3 = every year, 4 = twice a year, 5 = quarterly, 6 = monthly). The survey focused on company-internal communication, because company-external communication using a GRI-based report was conducted by all sampled companies (oekom 2016c).

For holistic CEM, at least three out of four ES levels had to show a positive association with CEP.

In his seminal paper on HR systems, Huselid (1995) covered the practices and processes level. He did not differentiate between these levels. Instead, he intended and has been able to show that companies using all the different HR management components reach more positive impacts, e.g., on turnover and financial performance. Using all the different HR management components and, thus, more than one HR system level represented his test of systemness or holistic HR management. I extend his approach to better reflect all known four levels to managing environmental engagement.

5.3.2.3 Vertical coherence

As existing research or secondary data did not contain data on vertical coherence, I developed a measure following the approach by Churchill (1979). First, the construct was clearly defined based on a research review (esp. Yuan et al. 2011; Kepes and Delery 2007; Morgeson et al. 2013). Then, I developed a comprehensive list of items characterizing

vertical coherence[22], also based on interviews conducted with 11 CSM experts (chapter 4). Discussing the items with three different CEM experts, four items were selected that best covered the construct. Conducting the survey, one item being perceived as misleading by multiple respondents was dropped leaving a three-item measure. The items assessed whether environmental objectives, plans and conducted activities were in line with company's values and / or policies; a company had mechanisms in place to detect, correct and if necessary, punish business conduct violating policy statements; or the company ensured that environment-related values and strategic goals are acted upon. Respondents had to rate the extent to which the items hold true for their company using a five-point Likert scale (1 = strongly disagree, 5 = strongly agree).

Huselid (1995) did not investigate vertical coherence but focused on horizontal coherence (he referred to it as internal fit) and company-internal consistency (he referred to it as external fit, i.e., the company being outside the HR system). Based on my qualitative study (chapter 4), vertical coherence matters more to CS managers than horizontal coherence. Thus, I look at vertical coherence and company-internal consistency.

5.3.2.4 Company-internal consistency

Company-internal consistency[23] was measured using four items from existing measures. Firstly, respondents chose the statement best describing their company out of 'Environmental activities do not necessarily relate to the corporate strategy.', 'Environmental activities are aligned with the corporate strategy after the corporate strategy has been set.' or 'The corporate strategy is formulated to incorporate environmental activities.' Secondly, respondents were asked to rate their extent of

[22] I assumed additive rather than synergistic positive fit in this exploratory study in line with Chadwick (2010).
[23] Following Chadwick (2010), I assumed additive rather than synergistic positive fit in this exploratory study.

agreement to statements on the integration of environmental aspects in, e.g., the strategic planning process, using a five-point Likert scale (1 = strongly disagree, 5 = strongly agree).

This approach differs from Huselid (1995). I could construct my survey in a way to develop a scale for company-internal consistency. Huselid (1995) took a pre-specified questionnaire which did not cover fit. Therefore, he had to use indirect measures for fit. Particularly, he investigated whether higher employee skills and motivation would be correlated with a company's strategy being classified as differentiation or focus strategy (Porter 1996), and with a stated high commitment of the respective company to conduct all investigated HR practices. He obtained insignificant results. I followed his recommendation for future research to better measure such constructs (Huselid 1995).

5.3.2.5 Control variables

Following past research (Torugsa et al. 2013; Aragón-Correa 1998; Kang 2013), I controlled for six potentially significant influences stemming from company characteristics. Data from Thomson Reuters EIKON was used to control for the company's size (natural logarithm of number of employees), its industry (Global Industry Classification Standard), its region (country of headquarter), past financial performance (average return on equity 2013-2015), and solvency (natural logarithm of average free cash flow 2013-2015). Moreover, experience in CEM (years) and social performance (oekom corporate rating) were controlled for. Regarding survey respondents, past research suggests to control for gender and the duration they have been working for a company (Peterson 2004; Raineri and Paillé 2016), as well as their attitude towards environmental protection (Dunlap et al. 2000).

5.3.3 Analysis

After data exploration using SPSS 24, I verified that the few missing values for company control variables could be imputed with mean values, because they were missing completely at random (Baltes-Götz 2013). For testing hypotheses, I applied structural equation modeling which proved well-suited for examining complex constructs like CEM and their impacts holistically (Rigdon 1998; Hair et al. 2011). In particular, I applied partially-least squares structural equation modeling (PLS-SEM) being increasingly applied in strategic management research (Hair et al. 2012a).

Methodological details on PLS-SEM and comparisons to covariance-based SEM can be found elsewhere (Lohmüller 1989; Chin 1998; Hair et al. 2012b). In brief, PLS-SEM estimates partial relations in measurement and structural models using an iteration of ordinary least squares regressions in order to explain as much variance of endogenous variables as possible.

In contrast, Huselid (1995) applied regression analysis to examine the impact of HR systems on different outcomes like turnover or financial performance incl. tests for moderation by fit. In contrast, I preferred SEM. Following the widely cited work by Hair et al. (2011), SEM is better suited to examine entire concept's impacts, here overall ES levels' impact on CEP incl. moderation by fit.

I have chosen PLS-SEM for three reasons: First of all, it can assess formatively measured constructs better than covariance-based SEM (Chin 1998). This is relevant, because my study mostly uses formatively measured constructs. Secondly, it is apt to explore newly addressed relations between several constructs (Hair et al. 2017), here the relation between different ES levels and CEP being potentially moderated by fit. Thirdly, PLS-SEM focuses on the prediction of endogenous variables, here CEP, by all exogenous,

here independent and moderating variables (Shmueli et al. 2016). Usually, scholars and practitioners would benefit from a high degree of predicted CEP resulting from the other variables in my research model. Covariance-based SEM is not suitable for examining the degree of prediction. Thus, my goal to offer insights on predictability of CEP is another reason for using PLS-SEM.

As last step, I conducted additional analysis regarding potential confounds of the results like insufficient statistical power, biases and unobserved heterogeneity in my data. All of these concerns were found to not be severe. This provides more solid ground for this study's results.

5.4 Results

Results are presented in three steps. First, an overview of descriptive statistics is provided. Second, I test hypotheses assessing models in PLS-SEM procedures. Finally, outcomes of additional analyses are summarized.

5.4.1 Descriptive statistics

Appendix 6 provides descriptive statistics and correlations of all items of the study. Multicollinearity is not of severe concern at item-level, as variance inflation factors (VIF) are below 5 (Menard 1995). For estimating correlations, I used Spearmans rho as nonparametric measure given its suitability for discrete and continuous items which lack normal distribution according to the Kolmogorov-Smirnoff test. Analyzing the correlation matrix, support can be found for expected positive associations between items measuring ES levels, both types of fit and CEP.

5.4.2 Tests of hypotheses

I estimated three structural equation models using SmartPLS 3 (Ringle et al. 2015) as software tool in order to reveal which hypotheses may have to be rejected. This approach is in line with previous studies (Surroca et al. 2010; Latan et al. 2016). The models were a baseline model including all constructs and controls except moderators (model 1), and two extended models by one hypothesized moderating construct each (model 2 incl. vertical coherence, model 3 incl. company-internal consistency).

When assessing models using the PLS-SEM method, a two-step procedure is followed: First, measurement models for constructs are evaluated. Then structural models for constructs' associations are examined (Hair et al. 2017; Chin 1998). Results on measurement model evaluations were shown in appendix 4. With reliable and valid measurement models, I can test hypotheses. The tables 9 and 10 show results of structural models assessment for the models 1-3.

To obtain the results, I relied on the following algorithms and settings: The PLS algorithm (300 maximum iterations) with path weighting scheme, a stop criterion of 10^{-7} (Hair et al. 2012b), and indicator weighting mode A for medium sample size (Becker et al. 2013a) yielded details on collinearity, path coefficients, explained variance, and effect sizes. Using bootstrapping with 5000 subsamples and the most conservative setting of 'no sign changes', I examined significance and standard errors (Hair et al. 2017). For predictive relevance, blindfolding with an omission distance of 6 was used (Chin 1998). I assessed moderating influences incl. significance of interaction effects with the two-stage approach recommended for formatively measured constructs (Henseler and Chin 2010).

Table 9 provides correlations between constructs, plus their VIF. All VIF are below 5. Thus, multicollinearity is not of major concern (Menard 1995; Hair et al. 2017).

Table 10 shows each model's explained variance (R^2) and predictive relevance (Q^2) for CEP, as well as path coefficients (ß), their standard deviation (S.D.), significance (p-values) and effect size (f^2)[24].

Figure 10 provides a graphical overview of the results, esp. ß and p-values.

H1 claimed that systematic, holistic CEM is associated with higher CEP than selective CEM, i.e., the majority of a) philosophies, b) policies, c) practices and d) processes showing higher environmental engagement is positively associated with CEP than the minority. Results of model 1 reveal positive, highly significant associations ($p \leq 0.01$) for b) policies (ß = 0.238), c) practices (ß = 0.301) and d) processes (ß = 0.186). Thus, a one-standard-deviation increase in engagement in policies, practices and processes leads to an increase in obtained CEP by 0.238, 0.301, 0.186 points, respectively. All of these associations are of weak effect size (Hair et al. 2012b). Regarding a) philosophies, no significant association is found leading to the rejection of this subordinate hypothesis. Nonetheless, results for H1b-d indicate that most ES levels are significantly positively associated with CEP lending support for H1.

[24] I follow Kenny (2015) and Hair et al. (2017) for interpreting effect sizes.

Construct	Mean	S. D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1 CEP	2.094	0.510	**VIF**															
2 Philo-sophies	3.871	0.822	0.533	1.990														
3 Policies	3.863	0.831	0.693	0.650	3.177													
4 Practices	3.816	0.716	0.725	0.491	0.649	2.950												
5 Pro-cesses	3.615	1.008	0.695	0.462	0.662	0.666	2.572											
6 Cohe-rence	3.875	0.650	0.488	0.362	0.515	0.658	0.498	2.078										
7 Consi-stency	3.713	0.884	0.646	0.474	0.583	0.629	0.509	0.540	2.092									
8 Social perfor-mance	2.076	0.392	0.623	0.459	0.557	0.466	0.558	0.401	0.395	2.075								
9 Industry	11.031	6.934	0.186	0.006	-0.053	0.115	0.025	0.167	0.172	0.081	1.211							
10 Size	9.570	1.511	0.225	0.215	0.305	0.223	0.257	0.070	0.276	0.414	-0.126	1.901						
11 Expe-rience	3.578	1.244	0.293	0.293	0.260	0.207	0.341	0.089	0.246	0.201	0.008	0.239	1.274					
12 Financial per-formance	0.110	0.339	-0.024	-0.027	-0.072	-0.040	0.042	-0.099	0.022	-0.002	-0.113	0.066	0.061	1.070				
13 Solvency	19.166	1.573	0.211	0.112	0.218	0.182	0.228	0.064	0.127	0.412	-0.083	0.612	0.148	0.009	1.765			
14 Env. attitude	4.026	0.917	0.103	0.253	0.151	0.083	0.009	0.155	0.108	0.136	-0.127	0.073	0.009	-0.080	0.016	1.152		
15 Gender	1.442	0.498	0.095	-0.012	-0.010	0.108	-0.009	0.138	-0.025	0.074	-0.023	-0.117	-0.114	-0.005	-0.034	0.031	1.122	
16 Work duration	2.712	1.065	0.077	0.074	0.203	0.014	0.153	-0.023	0.106	0.037	0.003	0.183	0.256	-0.013	0.173	-0.004	-0.223	1.230

Table 9: Key statistics and correlations at construct-level (S. D. = standard deviation; VIF = variance inflation factors, grey-shaded)

Path to CEP	Model 1 ß	S. D.	p-value	f^2	Model 2 ß	S. D.	p-value	f^2	Model 3 ß	S. D.	p-value	f^2	Conclusion
Philosophies	0.033	0.059		0.002 Very weak	0.014	0.059		0.000 Very weak	0.025	0.061		0.001 Very weak	H1a rejected
Policies	0.238	0.068	***	0.065 Weak	0.253	0.068	***	0.072 Weak	0.183	0.074	**	0.038 Weak	H1b not rejected
Practices	0.301	0.061	***	0.134 Weak	0.365	0.078	***	0.163 Moderate	0.248	0.067	***	0.085 Weak	H1c not rejected
Processes	0.186	0.068	***	0.047 Weak	0.202	0.069	***	0.056 Weak	0.171	0.067	**	0.044 Weak	H1d not rejected
Coherence Philosophies*					-0.132	0.074	*	0.029 Weak					H2 rejected
Coherence Policies*					-0.002	0.059		0.000 Very weak					H2a rejected
Coherence Practices*					-0.041	0.084		0.003 Very weak					H2b rejected
Coherence Processes*					0.018	0.074		0.000 Very weak					H2c rejected
Coherence					-0.006	0.076		0.000 Very weak					H2d rejected
Consistency Philosophies*									0.206	0.065	***	0.077 Weak	
Consistency Policies*									0.105	0.062	*	0.023 Moderate	H3a not rejected
Consistency Practices*									0.004	0.076		0.000 Very weak	H3b rejected
Consistency Processes*									-0.05	0.066		0.003 Very weak	H3c rejected
Consistency									0.063	0.063		0.005 Very weak	H3d rejected
Social performance	0.220	0.073	***	0.080 Weak	0.239	0.076	***	0.095 Weak	0.231	0.072	***	0.096 Weak	
Industry	0.143	0.055	***	0.060 Weak	0.154	0.056	***	0.072 Weak	0.09	0.061		0.025 Weak	
Size	-0.058	0.075		0.006 Very weak	-0.075	0.075		0.010 Very weak	-0.077	0.075		0.012 Very weak	
Experience	0.067	0.054		0.012 Very weak	0.067	0.056		0.012 Very weak	0.074	0.052		0.016 Very weak	
Financial performance	0.019	0.048		0.001 Very weak	0.005	0.049		0.000 Very weak	0.005	0.034		0.000 Very weak	
Solvency	0.005	0.054		0.000 Very weak	-0.001	0.055		0.000 Very weak	0.022	0.055		0.001 Very weak	
Env. attitude	0.035	0.045		0.004 Very weak	0.039	0.05		0.005 Very weak	0.006	0.048		0.000 Very weak	
Gender	0.052	0.051		0.008 Very weak	0.057	0.051		0.010 Very weak	0.057	0.051		0.010 Very weak	
Work duration	-0.01	0.054		0.000 Very weak	-0.017	0.053		0.001 Very weak	-0.01	0.05		0.000 Very weak	
Adjusted R^2	0.681				0.678				0.702				
Q^2	0.628				0.609				0.637				

Table 10: Results of structural model assessment (* p≤0.1, ** p≤0.05, *** p≤0.001 (two-tailed); 0.000 due to rounding)

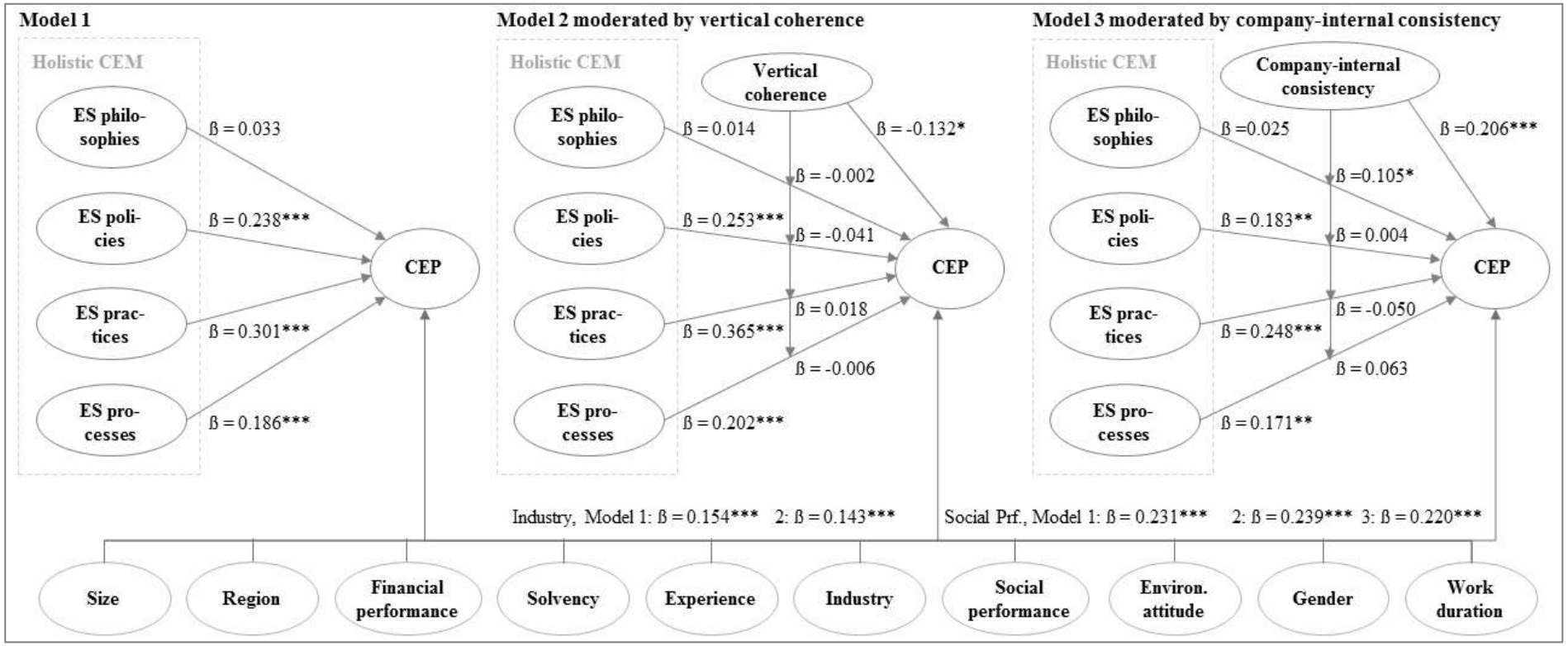

Figure 10: Results of structural models (* p≤0.1, ** p≤0.05, *** p≤0.001 (two-tailed); remark: For control variables, I only show path coefficients with significance of p≤0.1 or lower due to graphical limitations – complete results in table 10)

According to H2, a larger vertical coherence positively moderates the association between corporate environmental engagement along a) philosophies, b) policies, c) practices, d) processes, and higher CEP (and vice versa). However, results of model 2 suggest rejecting this hypothesis given insignificant interaction effects (e.g., $p > 0.1$ for Philosophies*Coherence). Similarly unexpected is the significant negative association of vertical coherence with CEP ($ß = -0.132$; $p \leq 0.1$). Anyhow, it is of almost very weak effect size.

These results do not alter when vertical coherence is measured differently. I rerun analyses with an adapted, indirect measuring approach from other research streams. Following Venkatraman (1989) and Huselid (1995), I assessed vertical coherence by comparing the deviations in mean values of each of the four ES levels per company. As such, a company having a larger deviation between philosophies, policies, practices and processes was assigned a lower vertical coherence than a company comprising similarly high or low mean values across all four levels. The adapted measurement approach also led to a rejected H2.

In H3, I anticipated that a larger company-internal consistency positively moderates the association between corporate environmental engagement along a) philosophies, b) policies, c) practices, d) processes, and higher CEP (and vice versa). Results from model 3 provide partial support for H3. Company-internal consistency significantly, positively influences the association between a) philosophies and CEP ($ß = 0.105$; $p \leq 0.1$). This influence is of moderate effect size. For H3b-d, the influence remains insignificant leading to rejecting these subordinate hypotheses. Regardless, results reveal a highly significant positive association of company-internal consistency with CEP ($ß = 0.206$, $p \leq 0.01$) being

of weak effect size. Consequently, this study offers support for claims on an important influencing role of company-internal consistency towards CEP.

The results are underpinned by different models' R^2 and Q^2. R^2 for CEP is substantial in all models (min. 0.678) with a noticeable increase when company-internal consistency is added as moderator (0.702). These values are above those found in previous research (Tollin et al. 2015; Park et al. 2016; Attig and Cleary 2015). Similarly, Q^2 (0.609-0.637) underlines the high predictive relevance, esp. of model 1 and model 3 towards CEP. Thus, a holistic engagement across ES levels as well as their consistency to other company management components leads to larger shares of explained variance and prediction of CEP than in past research.

Last but not least, an inspection of control variables reveals that the rating of the social CS area coincides with rated CEP given a significant positive association (ß =0.220-0.239, $p \leq 0.01$). Thus, companies being active in CS likely engage in social and environmental areas to a similar degree which support past findings (Schaefer 2004; Buysse and Verbeke 2003). Moreover, industry is to be controlled for as it significantly impacts CEP ($p \leq 0.01$[25]) supporting previous research (e.g., Kang 2013; Melo 2012).

5.4.3 Additional analysis

Given the limited sample size of n = 147, sufficient statistical power may be an issue. The post-hoc test using the tool G*Power 3 alleviates this concern (Faul et al. 2007). Conservative settings (two-tailed test, number of predictors = 8, $f^2 = 0.06$ based on model 1) yield a statistical power of 0.83 which increases up to 0.97-0.99 for more commonly found settings ($f^2 = 0.1$-0.2). All these values are above the commonly recommended threshold of 0.8 (Cohen 1992).

[25] Given the arbitrary coding of industries, no meaningful interpretation of ß is possible.

Another frequent concern in SEM-based research regards to model fit, widely due to the objective of theory testing in covariance-based SEM. Therein, scholars use established fit indices to judge how well data fits a theoretically constructed model. However, PLS-SEM aims at exploring models for high prediction of endogenous variables and does not require a common factor model with uncorrelated outer residuals being basis for many fit indices from covariance-based SEM (Henseler et al. 2014). Consequently, scholars are recommended to cautiously draw inferences from model fit assessment in PLS-SEM, because the few fit indices likely suited for PLS-SEM are not yet sufficiently understood (Dijkstra and Henseler 2015; Hair et al. 2017). Against this caveat, appendix 7 provides this study's results along currently suggested fit indices. Models 1-3 meet recommended thresholds for at least half of criteria suggesting that one can expect sufficient model fit.

Moreover, bias or unobserved heterogeneity in data may confound research results. Thus, I fostered a-priori and verified post-hoc the representativeness of data against three types of bias and heterogeneity. None of these issues is severe.

Firstly, common method bias was widely circumvented by combining different data sources for independent and dependent constructs. To limit risk of common method bias among survey-based constructs, I followed recommendations for survey development by Podsakoff et al. (2003). As such, the survey contained different forms of scales and questions were not allocated in the logical flow presented in the hypotheses to reduce response artifacts. The post-hoc analysis using Harman's one-factor test also suggests that common method bias is not of great concern as a constructed single factor of items measuring the constructs philosophies, policies, practices, processes, vertical coherence, company-internal consistency explained not more than 43% of variance being below the 50% threshold (Podsakoff and Organ 1986).

Secondly, I tested for non-response bias following the procedure by Armstrong and Overton (1977). The obtained responses were split into a first and second half of the data collection period. Comparing the groups, I find no significant difference for survey items.

Thirdly, I addressed social desirability bias by treating respondent information confidentially and analyzing results in an aggregated manner (Fisher 1993; Huber and Power 1985). Post-hoc, I checked robustness of survey responses by testing association between respondents' judgment on CEP as a two-item construct with the respective CEP rating. Results in appendix 8 show a significant, positive association suggesting that social desirability bias is not a major problem. Anyhow, caution deems advisable in interpreting results based on the descriptive statistics in appendix 6. All items measuring philosophies, policies, practices, processes have high mean values and are negatively skewed suggesting a slight upward tendency in responses.

Last but not least, I checked for heterogeneity using finite-mixture partial least squares (FIMIX-PLS) and where possible PLS prediction-oriented orientation (PLS-POS) (Becker et al. 2013b; Sarstedt and Ringle 2010). Results (available upon request) reveal not more than one segment in data stressing that consistent patterns exist across this study's sample.

All in all, results can be regarded to as statistical powerful, not severely confounded by bias, and generalizable given absent heterogeneity. This sets findings on solid ground.

5.5 Discussion and conclusions

This study has investigated the linkage between managed environmental engagements of companies (CEM) and externally rated environmental performance (CEP) paying special attention to the role of holistic CEM and two types of fit. Drawing upon general systems theory and HR systems, I introduced the environmental system (ES) spanning

philosophies, policies, practices and processes. I argued that holistic CEM spanning the majority of ES philosophies, policies, practices and processes leads to increased CEP compared to selective CEM. Additionally, I suggested a positive moderating role of vertical coherence and company-internal consistency. Having tested hypotheses using PLS-SEM for data from three sources for 147 companies, I find support for the importance of holistic CEM and a partial moderation by company-internal consistency towards increased CEP. I discuss the results to derive implications, before I present limitations and future research avenues.

5.5.1 ES levels and holistic CEM for increased CEP

Following conceptual claims to holistically manage environmental engagement (Margolis and Walsh 2003; Starik and Kanashiro 2013), this study provides first evidence that holistic CEM drives higher CEP. This is based on the result that most ES levels significantly increase CEP, esp. policies, practices, and processes. This encourages a systems perspective on CEM for reaching and explaining enhanced outcomes (Starik and Rands 1995; Reynolds 2008). At a broader scope, my results also support applying general systems theory to the management of corporate sustainability which includes environmental engagement (Mason and Simmons 2014; Bansal and Song 2017).

Regarding philosophies as ES level, no significant positive association to CEP is found, in contrast to past research (Surroca et al. 2010; Übius and Alas 2009). Deviating results may have conceptual and methodological causes. Environmental philosophies could be harder to grasp and establish than social philosophies. For example, Chang (2011) found ‘green competitive advantages’ resulting from ethical rather than ‘green’ philosophies. Indeed, extensive public and scholarly discussions fostered a common understanding on ethically right and wrong behaviors of companies and their employees

(Schnebel and Bienert 2004; Bansal and Song 2017). A similar discourse on environmentally-friendly vs. -unfriendly behavior has not yet taken place (Bansal and Song 2017). Rather, environmental regulation was sharpened to varying degree in different countries increasing compliance mentality instead of deep understanding (Aragon-Correa and Sharma 2003; Walker et al. 2015). Another barrier to unequivocally understood environmentally-friendly behavior lies in characteristics of environmental issues occurring at often entirely different locations than their causes, and after long time horizons (Thomas et al. 2007). Furthermore, methodological aspects may explain deviating results like insufficiently covered long-term effects of philosophies in this study or weak consideration of (intangible) philosophies in the chosen CEP rating (see 5.5.4).

Such remaining unclarities regarding philosophies do not diminish the main finding that holistic CEM drives higher CEP.

5.5.2 Moderating role of fit

To better understand what determines superior CEP (Wood 2010), I also examined the moderating role of fit, particularly vertical coherence (fit across ES philosophies, policies, practices and processes), and company-internal consistency (fit of ES level components to respective components in a company system).

Fit has been widely mentioned as key success factor in this research field (e.g., Vidal et al. 2015). Fit is also a core part in many theories like general systems theory (Ulrich 2001) or the RBV (Hart 1995; Barney 1991). It also plays a relevant role in HR systems (Kepes and Delery 2007). However, the scarce empirical works on fit, that focus mostly on consistency instead of coherence, yielded deviating results (Huselid 1995; Delaney and Huselid 1996; Becker and Huselid 2006). This study contributes to research by offering additional empirical evidence for the role of fit in CEM.

Unexpectedly, vertical coherence is not found to moderate the association between environmental engagement and CEP. This contradicts the relevance of 'walking the talk' for enhanced CEM outcomes (Maon et al. 2009; Azapagic 2003). Furthermore, claims of general systems theory cannot be supported that aligned components better transform inputs into outcomes (Ulrich 2001). Similarly, implied coherence in resources for reaching competitive advantages in the RBV is not underscored (Hart 1995; Barney 1991). Such theoretical claims may have to be revised in future. However, I recommend verifying my results in additional studies before revising theories, because this study is the first to quantitatively test moderating influences by vertical coherence in CEM. I also reach this conclusion based on my own qualitative research (chapter 4) revealing that pioneering companies in sustainability paid attention to vertical coherence. Thus, methodological issues in measuring vertical coherence or limited insights on vertical coherence by the third-party CEP rating may have led to an insignificant moderating effect. Such limitations also seem to be the most plausible explanation for the found negative impact of vertical coherence on CEP. Regardless of the sign, the significant association between vertical coherence and CEP should be considered in future studies, at least as control variable.

In contrast to vertical coherence, I find partial support for the positive moderating influence between CEM and CEP by company-internal consistency, particularly for the philosophies level. The fact that the philosophies level yields these results reinforces that holistic CEM is crucial to predict higher CEP. Additionally, company-internal consistency increases CEP as expected according to general systems theory (Ulrich 2001) and in line with previous findings on HR systems (Huselid 1995). The finding in the paper at hand also supports claims to treat CEM as core rather than peripheral aspect in company management (Yuan et al. 2011). Thus, my study offers support for the change management research stream (Maon et al. 2009; Haberberg et al. 2010). Furthermore, the RBV implying

complementary assets for achieving sustained competitive advantages is supported (Christmann 2000). All in all, scholars are well advised to reflect company-internal consistency in future studies.

5.5.3 Implications for practice

In line with my findings grounded in general systems theory, I suggest managers to holistically manage their company's environmental engagement and to pay particular attention to its consistency with other company management components in order to achieve superior third-party ratings of environmental performance.

What is the basis for increased performance?

To improve a company's rating of environmental performance, managers are advised to holistically engage in environmental efforts. Holistic environmental engagement spans philosophies (e.g., values, norms), policies (e.g., strategic objectives, responsibilities), practices (e.g., plans, procedural guidelines), and processes (e.g., conducted actions in fields like HR management, product / service development, company-internal communication, progress tracking). As shown, third-party ratings of environmental performance, although not being uncriticized, do reflect what companies aim at doing (policies) in specified manner (practices) given behavioral guidance (philosophies), and what is really done (processes).

Better environmental performance ratings have been found to enhance other performance-related outcomes like corporate reputation, stakeholder trust, and avoided costs for environmental issues or boycotts. All of these outcomes have been revealed to improve corporate financial performance eventually. Consequently, a holistic environmental engagement is a crucial basis for superior environmental and subsequent performance outcomes for companies.

Which other influences to consider?

This study shows that attempts to treat environmental management as add-on while conducting environmentally-unfriendly business-as-usual will deteriorate third-party ratings. Instead, fit matters! Particularly, a consistent approach of environmental engagement with general company's management further increases environmental performance. Consistency means to align environmental and company management components, or at best to fully integrate them. Successfully establishing such consistency requires that all managers and eventually also employees contribute to this effort. Therefore, change levers should be pulled throughout a company like informing, involving, and encouraging (esp. also middle) managers and employees.

5.5.4 Limitations and future research

Despite relevant contributions and implications, this study faces some limitations which future research is invited to overcome.

First, measures may not be optimal, despite met validity and reliability criteria. Although the oekom corporate rating is among the most credible and transparent ratings (Schröder 2017; Sadowski 2013), any rating faces trade-offs in measuring CEP as multidimensional construct (Windolph 2011). Deviating results between other ratings have been found (Chatterji et al. 2016). Thus, future research is encouraged to replicate this study, potentially to extend it with additional ratings. I aimed at providing all needed information for replication in order to overcome a potential credibility crisis in strategic management research (Bergh et al. 2016). As another area for future improvements, measures for ES levels covered core determining aspects, but they could not cover all potentially relevant actions fields at processes. I followed a best practice approach also used in HR system research (Becker and Huselid 1998; Huselid 1995) and to ensure

practicability in data collection. Research may further be advanced with new methodologies for testing the systemness (e.g., with higher order models) or equifinality (e.g., using fuzzy set qualitative comparative analysis).

In this regard, larger research studies may advance ES level measures. Furthermore, enhanced measurement for vertical coherence seems needed.

As a second limitation, this study relied on cross-sectional data at one point in time. Consequently, I can only conclude on general associations not on causal directions between constructs. Furthermore, long-term impacts require future assessments using longitudinal data, esp. for philosophies (Melo 2012; Sugita and Takahashi 2015).

Thirdly, it may be possible that other constructs intervene in examined associations. As such, scholars may want to control for macro systems like the business environment more directly than by screening the sample (Aragon-Correa and Sharma 2003); or for individual-level influences like values of top-managers (Aguinis and Glavas 2012).

A fourth limitation is the sample focused on large, public companies headquartered in Northern or Western European countries. In future, it would be interesting to see whether results also hold for privately owned, small- or mid-sized companies in different regions (e.g., Hofmann et al. 2012; Yeh et al. 2014).

Last but not least, I focused on the environmental area of CS for exploring the association to performance outcomes and moderating influences of fit. Testing these linkages and influences for CSM overall is another fruitful research avenue.

All in all, this study has set the stage for an advanced understanding of determinants of high corporate environmental performance by empirically underpinning the relevance of

holistic corporate environmental management taking a systems perspective and examining the moderating role of fit.

6 Practical implications for corporate sustainability management of energy companies

Nowadays, engaging in CS is common practice among energy companies as shown in global surveys among top-executives (Bonini and Bové 2014; Singer 2016). More so, many energy companies aim at enhancing their competitiveness by strategically and holistically engaging in CS (ibid.; Pätäri et al. 2014). This objective is supported by research studies including this dissertation that reveal overall positive performance impacts for strategic and holistic CS engagement. Such performance impacts are reflected, e.g., in mindsets fostering sustainable business conduct in a company, better third-party ratings of CSP, and eventually higher CP (Lee et al. 2011; Cai et al. 2012). In contrast, reactive or neglected CS engagement by energy companies lead to increased external pressure (Mirvis 2000; Mobus 2012) and deteriorated credibility (Alhouti et al. 2016). My quantitative study in this dissertation (chapter 5) supports such findings, despite its limitations to focus on the environmental CS dimension and taking a cross-industry sample. I choose this focus to elaborate on areas of relevance for energy companies and to ensure high quality of data inputs in a sufficiently large sample. Results from my quantitative study can be seen as relevant for CS research, particularly CS engagement of energy companies given their cross-industry relevance and focus on the traditionally most relevant CS area for energy companies. Furthermore, research reviews showed even stronger performance associations of the social CS dimension than the environmental one (e.g., Orlitzky et al. 2003).

Despite empirical results on positive performance impacts for strategic and holistic CS engagement, managers and CS coordinators in energy companies face challenges on how to reach the full potential of CS engagement.

As overarching premise, CS engagement has to be dedicatedly managed. This has been shown in research (chapter 4[26]; chapter 5[27]; Pacheco and Dean 2015; Lindgreen et al. 2009a) and surveys among practitioners (Singer 2016; Mosher and Smith 2015).

Indeed, managers and CS coordinators in energy companies have put relevant effort in improving their companies' effects on the social, environmental and economic bottom line (Elkington 1994). However, these efforts are not nearly as effective as possible. The likely reasons are that practitioners have not received sufficient guidance on handling CS as complex construct. It is still abstract what to address, which components to use for which purpose, and which influences to consider for successfully managing CS engagement (Lindgreen et al. 2009b). Here, I guide practitioners in energy companies in applying a systems perspective to managing CS engagement. This is underpinned by a proposed CS system framework and research results in this dissertation.

6.1 Knowing what to address

Energy companies have been at the forefront of public pressure for CS engagement due to their high imposed risks from producing, transporting and supplying energy (Bolton et al. 2011; Du and Vieira 2012; Pätäri et al. 2014). For example, incidents like oil spills in the Gulf of Mexico in 2010 or the leak at the nuclear power plant in Fukushima in 2011 underline why it is so important to prevent and control environmental risks (Ströbele et al. 2010; dpa 2011). Once such incidents occur, they do not only have environmental effects but also social ones like health concerns and relocations (Flauger et al. 2011; Mobus 2012). Moreover, they trigger regulatory decisions like the nuclear phase-out in Germany (dpa 2011) and South Korea (McCurry 2017). Furthermore, the internationally discussed

[26] The qualitative study examined and compared how CS is managed by seven energy companies and one of their key suppliers based on case studies using expert interviews and company-provided data in 2016.
[27] The quantitative study conducted in 2017 investigated determinants of performance impacts focusing on one, namely the environmental CS dimension. Data from 147 European companies in different industries was analyzed.

misconduct by the energy company Enron led to rising pressures for transparency and long-term oriented decision making (Petrick and Scherer 2003).

Today, managers and employees in energy companies are well-aware that sustainable business conduct is important (Bolton et al. 2011; Pätäri et al. 2014; chapter 4). However, the abstract social, environmental and economic dimensions of CS hinder a clear understanding of what to address (Delai and Takahashi 2011). The lack of clear understanding and untargeted efforts may overstrain companies (Porter and Kramer 2006).

Consequently and based on my qualitative study (chapter 4), energy companies shall look at the ten common CS areas. The ten CS areas are derived from well-known CSM instruments, namely the UN Global Compact (UN 2014), GRI G4 (GRI 2013b) and ISO 26000 (ISO 2016). Energy companies are recommended to first analyze these ten CS areas for their relevance and then prioritize them. Doing so, they need to cover the social, environmental and (not or) economic dimension of CS (chapter 4). It is worth noting that some CS areas matter for more than one CS dimension as shown in table 11.

The overview in table 11 is particularly relevant for practitioners in energy companies as it summarizes potentially relevant CS areas in the different energy industries. The examples are neither complete nor relevant for all companies per industry. Instead, every company shall regularly examine and prioritize its CS areas.

Overall, there is a misled, yet widespread belief that addressing environmental CS areas (i.e., sustainable resource use, pollution and climate change mitigation, biodiversity) suffices for becoming sustainable as energy company. A senior CS manager in a large German electric utility phrased it well saying that “there is a danger to reduce the topic sustainability to energy generation technology (...). Therefore, I always emphasize our

sustainability framework with the three dimensions (...) clarifying that we can totally loose (...) even when we have CO_2-neutral (...) energy generation" (C1 in chapter 4). Energy companies have to also fulfill responsibilities regarding social CS areas mirrored in stakeholder engagement, human rights, labor practices, fair operating practices, consumer issues, as well as community involvement and development. In these regards, energy companies look for the health and safety of employees and partners, and anchor social justice in their operations and supply chains (chapter 4; Poisson-de Haro and Bitektine 2015; Hubik 2017; E.ON 2014; RWE 2015).

Moreover, energy companies have important economic responsibilities. On the one hand, it is crucial to foster transparency linked to fair operating practices in order to enhance credibility of CS engagement (Salzmann 2004; Miras-Rodríguez et al. 2015). On the other hand, energy companies shall create employment and wealth by ensuring their going-concern and competitiveness. These responsibilities are important, as shown by a statement of the CS coordinator of a German electric utility that generates electricity only from renewable energy sources or natural gas: "We always used to have a strong focus on the ecological dimension. But one, two years ago, we realized (...) that we also need other dimensions, esp. economic viability, to reach a healthy balance" (C5 in chapter 4). Eventually, economic success of energy companies allows investing available resources philanthropically, e.g., to foster local community development (Wagner and Hense 2016; Abro et al. 2016).

CS areas	Examples for O&G companies	Examples for electric utilities	Examples for municipalities	Examples for TSOs, DSOs
Stakeholder engagement	- Handling diverse expectations and forms of exchange in different countries of operations - Striving for international standards - Winning NGOs as partners, esp. in developing countries	- Fostering involvement of stakeholders at regions of operations and along supply chain, esp. for fossil energy sources	- Fostering involvement of local stakeholders	- Fostering involvement of affected stakeholders by (new) grid lines - Informing stakeholders proactively, e.g., about electric fields, outages
Human rights	- Enforcing internationally defined rights, esp. in developing countries and supply chains	- Enforcing internationally defined rights, esp. in supply chains for fossil energy sources	- Enforcing internationally defined rights	- Enforcing internationally defined rights, esp. in developing countries and supply chains
Labor practices	- Ensuring healthy and safe working conditions, esp. at platforms, pipelines, refineries – also for supply chain partners - Securing jobs when O&G reserves deplete - Fostering diversity and fair development opportunities	- Ensuring healthy and safe working conditions, esp. at power plants – also for supply chain partners - Establishing secure employment - Fostering diversity, development, work-life balance	- Ensuring healthy and safe working conditions, esp. at power plants – also for supply chain partners - Establishing secure employment - Fostering diversity, development, work-life balance	- Ensuring healthy and safe working conditions, esp. at grid lines – also for supply chain partners - Fostering diversity, development, work-life balance
Fair operating practices	- Ensuring anti-corruption - Establishing fair revenue splits, esp. with developing countries for granted access to O&G reserves - Partnering along value chain at eye-level	- Establishing fair business conduct - Trading energy in compliant, fair manner - Allowing access of prosumers to energy markets	- Establishing fair business conduct - Trading energy in compliant, fair manner - Allowing access of prosumers to energy markets	- Ensuring fair business conduct - Offering fair system usage charges

Table 11: Overview of typical CS areas examples per energy industry (based on ISO 2016; UN 2014; GRI 2013; research review in chapter 3; study results in chapter 4)

CS areas	Examples for O&G companies	Examples for electric utilities	Examples for municipalities	Examples for TSOs, DSOs
Consumer issues	- Offering safe, competitively-priced O&G products - Adjusting portfolio to best meet needs, e.g., gas or renewably generated electricity as fuel for vehicles	- Offering transparent, fairly-priced electricity charges and services - Adjusting portfolio to best meet needs, e.g., charges of 100% renewably generated electricity - Ensuring data security	- Offering transparent, fairly-priced electricity charges and services - Adjusting portfolio to best meet needs, e.g., charges of 100% renewably generated electricity - Ensuring data security	- Offering stable, safe electricity supply - Ensuring transparent information on electric fields - Fostering data security
Community involvement and development	- Involving communities at operating sites for prioritizing philanthropic investments - Ensuring communities' health and safety - Agreeing upon mitigation measures for worker migration and rising unemployment when reserves are depleted	- Involving communities for prioritizing philanthropic investments - Establishing secured energy access, esp. in developing regions - Avoiding nuclear disasters	- Investing philanthropically to support sports, culture, heritage - Establishing secured energy access, esp. in developing regions	- Minimizing noise, dust, electric fields around grid lines
Sustainable resource use	- Ensuring saved O&G resources along operations - Extracting O&G resources using technologies with minimal natural side-effects	- Increasing efficiency in electricity generation for saved resources - Fostering usage of renewable rather than fossil energy sources	- Increasing efficiency in electricity generation for saved resources - Fostering usage of renewable rather than fossil energy sources	- Avoiding loss of electricity by highly efficient grid lines - Prioritizing efficiency increases of existing over constructing new grid lines

Table 11: Continued

CS areas	Examples for O&G companies	Examples for electric utilities	Examples for municipalities	Examples for TSOs, DSOs
Pollution and climate change mitigation	- Avoiding air emissions, esp. from gas flares - Preventing and if necessary cleaning land and water pollution - Reducing and treating occurred waste products	- Avoiding or at least minimizing air emissions - Preventing and if necessary cleaning land and water pollution	- Avoiding or at least minimizing air emissions - Preventing and if necessary cleaning land and water pollution	- Minimizing grid losses and emissions from own operations or insulations
Biodiversity	- Avoiding adverse effects, esp. on endangered species due to extraction plants, pipelines, platforms - Restoring natural habitats - Rescuing, reintroducing species harmed by oil or gas leaks	- Avoiding adverse effects, esp. on endangered species due to power plants, landscape alterations - Rescuing, reintroducing species harmed by operations - Avoiding nuclear disasters	- Avoiding adverse effects, esp. on endangered species due to power plants, landscape alterations - Rescuing, reintroducing species harmed by operations	- Minimizing changes to landscapes and vegetation - Avoiding adverse effects, esp. on endangered species - Restoring natural habitats
Economic contribution	- Securing competitiveness for going-concern, wealth creation - Creating employment in various countries - Ensuring transparent, good corporate governance	- Securing competitiveness for going-concern, wealth creation - Creating employment in regions - Ensuring good corporate governance	- Increasing efficiency for local communities' wealth creation - Creating employment, sub-contracting in regions - Ensuring good corporate governance	- Ensuring stable energy supply linked to reliability, efficiency - Handling of increasingly decentralized electricity generation, incl. available resources for doing so - Ensuring employment

Table 11: Continued

Changing market conditions diminished financial strength of energy companies (Schier 2017; Delmas et al. 2007b). Nevertheless, changing market conditions also create CS-related opportunities for energy companies: They play a key role in reaching energy transitions decreed in several countries like Germany (Rogall et al. 2016; BMWi 2017). The German Energiewende pushes for more renewable instead of fossil energy sources used in increasingly decentralized energy generation (IEA 2014; Ströbele et al. 2010). This has environmental and social advantages. However, it yields new business opportunities for energy companies. So, the CS dimensions are interdependent which is also important to consider in managing CS engagement.

Based on a deeper understanding on what to address, energy companies can tackle the next challenge on how to manage CS engagement.

6.2 Utilizing a holistic set of components

To continuously advance CSM and address CS areas, a set of components needs to be utilized as shown in findings from research (Valenti et al. 2014; Baumgartner 2014) and practice (Singer 2016). Practitioners need to be aware of the distinct purposes of these CSM components. Thanks to my qualitative and quantitative studies (chapter 4; chapter 5), the CS system framework emphasizes the purpose of different components along four distinct levels, namely philosophies, policies, practices and processes. The following overview shortly describes each level's purpose and highlights CSM components in order to ease successful CS engagement for people working in energy companies.

Firstly, *philosophies offer company-wide guidance by clarifying what is preferable*. They are often written in codes of conduct of energy companies (chapter 4). However, many companies often lack lived CS-enforcing corporate values. Most interviewed CS coordinators did not see it as part of their job to shape values (C2, C3, C4, C6, C7 in

chapter 4). CS-enforcing values are, e.g., protection, sufficiency, safety, cooperation, justice and honesty. In fact, companies which have CS-enforcing corporate values achieved higher performance impacts in empirical studies (Surroca et al. 2010). This is well-explained by a senior CS coordinator in a large, German electric utility saying that "In the long-run, culture, values, norms are crucial (...) as a compass directing employees' decisions." (C1 in chapter 4). In contrast, companies that neglect CS-enforcing values are more prone to show corruption (Campbell and Göritz 2014). Similarly, a mismatch between communicated, CS-enforcing values and lived, CS-conflicting values was a major cause for the oil spill in the Gulf of Mexico in 2010 (Mobus 2012). Consequently, it is an important task of CS coordinators, CSOs and top-managers to formulate and anchor such corporate values in everyday business conduct. Their joint efforts and role model behavior particularly help establishing new corporate values that determine the lived culture (Buller and McEvoy 2016; Yazdani and Murad 2015). Energy companies that traditionally focused on CS-conflicting values are recommended to engage in dedicated change efforts (Salzmann 2004; Kapstein and Wempe 2001; chapter 4). Such change spans different phases being awareness creation, unlearning of old business conduct, formulating and establishing desired business conduct, as well as refining and eventually institutionalizing desired business conduct (Maon et al. 2009). Going through such change requires long-term efforts. Thus, energy companies should not postpone cultural change and need to be granted sufficient time for this internal effort (Mirvis 2000; Haberberg et al. 2010).

Secondly, *policies have the purpose of outlining objectives and responsibilities*. Thus, they direct attention and behaviors of managers and employees, and they clarify everyone's CS-related duties. Regarding objectives, a defined strategy with clear goals and according time horizons is a prerequisite, esp. for energy companies claiming to engage in CS strategically (Steger 2004; Pätäri et al. 2014). All examined energy companies in my

study had CS-related goals in place or were in the process of re-defining those (chapter 4). However, a detailed, ambitious, long-term strategy towards sustainable business conduct remains rare characterizing CS leaders (Singer 2016). Turning towards responsibilities, energy companies seem to rely widely on formalized responsibilities (all investigated companies in chapter 4). At least, an owner of CS in top-management like a CSO is recommended to be established, as well as a responsible person or entire unit for coordinating CS engagement which have a network of dedicated CS coordinators throughout the company, good company-internal connections and influence on decision-makers (C2, C3, C6, C7, C8 in chapter 4). Furthermore, specialized committees may be formed at top-management level to drive achievements in particularly relevant CS areas (C4 in chapter 4; Klettner et al. 2014). In any case, isolated CS-related responsibilities have to be avoided, at best by defining each position's CS-related duties (Vidal et al. 2015; C6 in chapter 4). Sometimes, a detailed definition of such responsibilities is not possible. Then, sustainability-inclined managers and employees need to be empowered and encouraged to engage in CS voluntarily (Slack et al. 2015; C6 in chapter 4).

Thirdly, *practices specify what shall be done how by whom and until when in order to smooth the achieving of objectives*. Thus, energy companies are encouraged to include CS in their strategic planning – a component utilized only by CS leaders so far (C3 in chapter 4; Singer 2016). As a result, clear and ambitious plans that still grant some flexibility are obtained (Wood 1991; C3, C4 in chapter 4). Acceptance of plans is increased by involving persons or units that are expected to execute plans later on (Bolton et al. 2011) and by breaking down targets with a clear link to strategic objectives (Kapstein and Wempe 2001). Additionally, energy companies are encouraged to faster and efficiently allocate sufficient human, financial and time resources – until now, a major blocking stone in practice (Fairfield et al. 2010; C1, C3, C5, C6 in chapter 4). As last component worth mentioning

here, the requirements for progress tracking procedures and management systems as progress tracking tools are to be specified (Zwetsloot 2003; DeBono 2004). Whereas management systems seem to be a common tool in energy companies (C1, C3, C4, C5, C6, C7 in chapter 4), clearer requirements for progress tracking and according KPIs are areas for improvement (C1, C2, C3, C4 in chapter 4).

Fourthly, *processes represent the operational execution of CS engagement along a company's value chain*. For energy companies operating critical grid lines or using fossil or nuclear energy sources, the handling of urgent, one-time incidents has to be prepared well for fast reaction whenever needed. Such preparation should define triggers, procedures and teams (Vaaland and Heide 2008). Being prepared for ad-hoc incident handling seems to be the exception in current energy companies' CSM (C6, C7 in chapter 4). In contrast, most companies are active in conducting and enhancing regular processes. There are plenty of action fields for regular processes like supply chain management, operations, sales and after-sales services, human resource management, or communication – covering the entire value chain of energy companies.

Here, communication shall be elaborated on. The pioneering effort and focus on CS reporting by energy companies has not only caused praise but also criticism (Pätäri et al. 2014; Herbohn et al. 2014; Mio 2010). The credibility of CS reports can be improved by offering transparent, stakeholder-oriented information that is grounded in systematically undertaken action rather than lighthouse projects (Scheunemann 2016; C2, C4 in chapter 4). Additional external communication shall enhance the two-directional flow of information, stress truthfulness of undertaken CS engagement, and foster mutual understanding, e.g., on why some CS areas are prioritized over others (Poisson-de Haro and Bitektine 2015; C4, C5 in chapter 4). This may be further supported by understatement

in external communication (Scheunemann 2016; C6 in chapter 4). Most importantly, energy companies are recommended to extend company-internal communication, as they have long neglected internal stakeholders and according communication (Bolton et al. 2011). Proactive, regular and engaging company-internal communication has been found to foster employees' support for planned CS-related changes (Mirvis 2000; Slack et al. 2015). It increases clarity throughout the company on what CS is for a company, why it is important and how the tasks of all managers and employees matter for successfully engaging in CS (Bolton et al. 2011). Consequently, managers and employees show larger commitment and represent their company more positively which enhances external perception and drives performance impacts (Dögl and Holtbrügge 2013).

All in all, successful CS engagement follows a dedicatedly managed route. Both, energy companies being new or experienced in CS engagement can benefit from a clearer understanding of the different purposes of CSM components.

In addition, it is important to note that the set of CSM components matters for achieving optimal performance impacts.

First, the impact of CS engagement is largest when a holistic approach is taken in managing CS. My quantitative study (chapter 5) reveals that *holistic CSM, i.e., a set of CSM components that covers all four CS system levels,* is associated with larger positive performance impacts than a selective approach. Thus, practitioners should leverage a set of components that span all four purposes in CSM.

Secondly, practitioners aiming at holistic CSM can *utilize the different company management levels* that are mainly in charge of handling respective CS system levels and their components. As such, normatively managing behaviors using philosophies is a top-

management task. Strategic management of policies is usually done by an extended team of top-managers, and managers heading businesses, key functions or regions. Middle managers are crucial for specifying CS-related practices as preparation for the execution in CS processes by operational managers and their team members. Additionally, CS coordinators support the different company management levels in their CS-related responsibilities. Involving all company management levels in CS engagement would increase company-wide ownership. Moreover, it facilitates holistic CSM which has larger positive performance impacts. Last but not least, these remarks fortify all sustainability-oriented people working in a company that encounter low top-management commitment to CS engagement, because it clarifies in which realms these people may foster CSM by themselves.

Thirdly, CS engagement *evolves over time with a changing set of CSM components*. As such, energy companies revised their ambition levels and CS-related structures (C1, C2, C7 in chapter 4), or plan CS activities increasingly efficiently (C5 in chapter 4). Moreover, the evolving character means that energy companies may start with selected components on few CS system levels in order to advance their CS engagement continuously towards holistic CSM. Consequently, all energy companies shall walk along the path towards sustainable business conduct. So-called controversial companies using fossil or nuclear energy sources are not per se unsustainable. Rather, they have a longer way to go and should be constructively encouraged to continuously increase their CS engagement!

Fourthly, a set of CSM components is more impactful with a *tailored approach*. CS engagement is not only a company-specific endeavor (Porter and Kramer 2006), but it also varies within a company due to different businesses, functions, or regions of operations. Table 12 provides examples of tailored CSM components.

System levels	Typical components	… tailored to businesses	… tailored to functions	… tailored to regions
Philosophies	– Code of conduct – (Lived) corporate values	– Environmental protection and health and safety norms, esp. in high-risk businesses – Relevance placed on CS by business management	– Awareness of CS-enforcing role across functions – Anti-corruption norm, esp. in sales	– Human rights standards, esp. in less-developed countries – Local culture and resulting company values
Policies	– Strategic objectives – Structures and responsibilities, e.g., CSO, CS coordinating unit	– Business goals on environmental, social and / or financial objectives – New business models fostering CS – Job descriptions incl. CS-related duties	– Function goals on environmental, social and / or financial objectives – Cross-functional teams for CS-related duties	– Local strategic goals – Harmonized CS ambition levels across regions – Local CS coordinating units
Practices	– Plans, programs – Requirements for progress tracking and management system – Guidelines and directives	– Business-specific plan – Detailed requirements for business-specific progress tracking	– Detailed plan to foster CS objectives in function – Functions' way of coordinating work refined to incorporate CS	– Region-specific plan and progress tracking KPIs – Harmonized management system as tool across regions
Processes	– Execution of CS activities along value chain – One-time incident handling – Regular activities	– Business value chain covered by CS activities – Revised, more environmentally friendly, socially prospering offering – Regular progress review across locations of business – Established incident teams in high-risk businesses	– Regular audits of factories (operations), trainings (HR), progress review across functions (controlling)	– Regional value chain covered by CS activities – Regular progress reviews and esp. local community involvement and engagement – Established local incident teams in high-risk areas

Table 12: Overview of CSM components and examples for tailoring them

6.3 Ensuring fit

The last but not least implication for successfully managing CS engagement in practice regards to fit. From a systems perspective, fit entails CS areas and CSM components to interact positively, even in a reinforcing manner. Fit in CSM means that CSM components interact well among each other, with other company system elements, and the outer environment in order to address the CS areas (von Bertalanffy 1950; Luhmann 1984). For example, CSM components shall be aligned among each other (Ketola 2008), CS engagement shall suit a company's business (Becker-Olsen et al. 2006), or it shall match stakeholders demands (Mazutis and Slawinski 2015; Mason and Simmons 2014) and the business environment (Porter and Kramer 2006).

In many energy companies, fit is established implicitly (de Jong and van der Meer 2015; C1, C2, C4, C7 in chapter 4). However, it is worth to dedicatedly work towards positive, even reinforcing fit, because it "will ultimately determine the credibility and effectiveness of CS(R) initiative outcomes" (Yuan et al. 2011, p. 76). In fact, empirical results support a significant positive moderating influence of fit between CSM and achieved performance impacts (chapter 5).

There are four different types of fit – and practitioners in energy companies are well-advised to strive for all four of them.

Vertical coherence is fit across CS system levels for walking the talk. Thus, CS-enforcing principles shall be reflected in strategic objectives and responsibilities as policies, which form the basis for plans and other practices steering the executed actions at the processes level. In my qualitative study, most energy companies emphasized vertical coherence as relevant type of fit which they mainly established by corporate alignment

procedures (C1, C4, C5, C7, C8 in chapter 4). This outweighs the insignificant moderating role of vertical coherence found in my quantitative study (chapter 5). The most likely reason for the result is the exploratory research stage which potentially faces methodological limitations. Vertical coherence is particularly relevant for energy companies due to past criticism for focusing on communication that lacked according action (Scheunemann 2016; Mio 2010). As phrased by a senior CS coordinator in a large, German electric utility: "There is nothing as unmasking as empurpled words and directives for employees that are not matched by own behaviors as manager and actions as a company" (C1 in chapter 4). In contrast, energy companies' credibility and performance impacts would be enhanced by establishing this type of fit. For doing so, energy companies may leverage feedback loops between CS system levels and according company management levels (Bolton et al. 2011; Asif et al. 2013). Such feedback would at best be exchanged regularly and in both directions, top-down (e.g., top-managers to mid-managers) and bottom-up (e.g., operational managers to mid-managers).

Horizontal coherence refers to fit at each CS system level. Energy companies seem to widely neglect this type of fit. Only few CS managers in the companies resolved conflicts among CS areas centrally before employees would have to do so (C2, C5 in chapter 4) or admitted that this is a highly complex task (C8 in chapter 4). In past research, horizontal coherence was reached by defining responsibilities in a way to best reach strategic objectives (Perera Aldama et al. 2009). CS coordinators are probably best-situated in many energy companies for identifying and addressing a lack of fit among the CSM components at each level.

Company-internal consistency represents fit between CS and company management at each level. As such, integrating CS-related goals into corporate strategy is decisive for many investigated energy companies in order to foster company-wide CS engagement (C1, C2, C3, C5, C8 in chapter 4). Such integration also signals the relevance placed on becoming sustainable as company which may improve external evaluations. In fact, my quantitative study revealed a significant moderating influence of this type of fit between CSM and enlarged performance impacts, esp. at the philosophies level (chapter 5). Companies shall avoid separated CS-enforcing values and corporate values, because such separated or even contradicting values may confuse stakeholders (Ketola 2008). Similarly, CS-related planning and executing of activities shall be in line with established mechanisms in a company (Schneider et al. 2014). The outlined company management levels shall be in charge of establishing company-internal consistency at their respective CS system and company system level.

Company-external consistency regards to fit of CS systems with the company's environment. Company-external consistency is reached by energy companies adapting CS processes and actions to regional contexts which goes in line with the above mentioned tailoring of CSM (Tian and Slocum 2016; C7, C8 in chapter 4). In general, this type of fit is more likely considered by practitioners as several business decisions are to be taken in light of companies' environment (e.g., Porter 1996; DiMaggio and Powell 1983). Regardless, establishing company-external consistency is cumbersome due to the multitude of influences in a company's environment. Thus, practitioners are recommended to prioritize key influences they want to fit their CS engagement to.

All in all, it becomes apparent that successfully managing CS engagement of energy companies is not a piece of cake. Rather, it requires a dedicated management approach which I hope to ease by the offered implications along the CS system framework. Practitioners who advance the management of their energy company's CS engagement can expect enhanced performance impacts as shown in past studies. Furthermore, they can underpin energy companies' key role in reaching sustainable development on our planet.

Of course, it requires more than energy companies' efforts for reaching sustainable development. Among others, stakeholders of energy companies play an important role, too. For example, only 27% of German consumers had contracts for receiving electricity generated from renewable energy sources in 2014, although the available share of electricity meeting this criterion was higher (Agentur für Erneuerbare Energien 2014). More so, 95% of German consumers are in favor of expanding the generation capacity using renewable energy sources. However, 37% of them are not willing to pay more for electricity (Thomson Reuters 2017). Thus, every stakeholder of energy companies is encouraged to facilitate the walk along the path towards sustainability by reflecting own demands and behaviors.

7 Conclusion

The overarching aim of this dissertation has been to enhance our understanding of how companies may successfully manage CS as complex construct in order to obtain increased performance. By applying a systems perspective to CS, I provided the long-demanded advanced framework for managing CS. The CS system framework clarifies CS areas and structures CSM components according to their purpose along four levels matching company management levels. Moreover, the CS system captures the decisive role of fit in four distinct types. Based on this framework, I offered explanations and first empirical results on how a managed CS system helps reaching implemented CS and increased CS-related performance. Thereby, I paid special attention to energy companies. Energy companies impose high sustainability-related risks and opportunities. Additionally, they look back upon profound, even pioneering engagement in CS.

All in all, my dissertation combined findings from research and practice to reach its overarching aim. First of all, existing research helped understanding CS as complex construct. Then I discussed CS in light of general systems theory and transferred insights from the comparable, already well-established concept of HR systems in HR research (Huselid 1995; Ostroff and Bowen 2016). Secondly, a systematic research review of CS engagement of energy companies revealed gaps in previously used theoretical backgrounds, typically relevant, yet unstructured CS areas and CSM components, as well as overall positive performance impacts subject to several influences and intermediate effects. This research review underpinned the need of an advanced CSM framework. Thirdly and for offering such a framework, I combined research knowledge and findings from a qualitative case study among CS-leading companies, namely seven energy companies and one of their key suppliers. The result is the CS system framework. Fourthly, I wanted to extend empirical evidence regarding the CS system. Thus, I tested

hypotheses on the achieved impacts from holistically managed corporate environmental engagement. I choose to focus on environmental CS areas for high quality of data inputs, their relevance for energy companies and the fact that CS research taking a systems perspective initially focused on environmental areas (Bansal and Song 2017). So, I examined determinants of superior corporate environmental performance using a dataset of 147 European companies in different industries. The focus on environmental CS areas and the necessity to take a cross-industry sample limits the direct transfer of insights to CS research, particularly CS engagement of energy companies. Nevertheless, the results can be seen as relevant for CS research, particularly CS engagement of energy companies for three reasons: Their cross-industry relevance, their focus on the traditionally most relevant CS dimension for energy companies, and research reviews (e.g., Orlitzky et al. 2003) showing even stronger performance associations of the social CS dimension than the environmental one.

Overall, my dissertation offers relevant contributions to research and practice. First and foremost, it helps enhancing CSM. The CS system being based on general systems theory as interdisciplinary background and the HR system as comparable concept meets all requirements of the long-needed advanced CSM framework (Margolis and Walsh 2003; Wood 2010; Starik and Kanashiro 2013; chapter 3). It fills the gap of a suitable theoretical background that captures determinants and influences of CSM and helps explaining its outcomes.

Furthermore, its comprehensive view on managing CS engagement creates clarity on elements that matter in general and allows highlighting elements that require adaptation. Whereas the former is important to ensure stability of systems (Bansal and Song 2017), the latter ensures company-specific, tailored CS engagement (ibid.; Porter and Kramer 2006).

In particular, the CS system comprises structural parts that entail to address CS areas, to utilize a set of CSM components for their distinct their purpose at system levels, and to establish different types of fit. Additionally, the CS system encourages flexible adaptations, e.g., by prioritizing CS areas and configuring particular CSM components along the CS system levels for their fit. Moreover, the CS system allows tailoring of CS engagement, e.g., to company's businesses or regions which grants flexibility, too.

Secondly, my work contributes to our understanding of fit in CS engagement. Fit deserves undivided attention as widely implied (e.g., Azapagic 2003; Mason and Simmons 2014), yet insufficiently investigated influence to many CS-related outcomes (Venkatraman 1989; Yuan et al. 2011; de Jong and van der Meer 2015). Having characterized types of fit and provided advice on establishing them in practice, my dissertation sets an important foundation for considering fit in research and practice.

Third, I extend our understanding on achieving implemented CS and performance impacts. The research stream on CS implementation is rather new (Lindgreen et al. 2009b). I provide a definition of implemented CS as established mindset in a company to run business sustainably in order to clarify what to aim at. Moreover, I explain how CS areas, CSM components and their fit can contribute to reaching implemented CS (chapter 4). Looking at CS-related performance impacts, the comprehensive view on CS areas, CSM components, and fit outlines what may determine such impacts. First empirical results show that a holistic rather than selective CSM approach drives higher CSP and that this association is positively moderated by fit (chapter 5).

All in all, my dissertation shows the advantages of applying general systems theory in CS research. It also contributes to strategic management research. CS research taking a systems perspective is concerned with the connections and interdependencies of

companies, societies, and environments. CS research in light of strategic management wants to capture how and why CS engagement may enhance performance (Bansal and Song 2017).

Last but not least, my dissertation underpins the necessity for industry-specific CS research (van Beurden and Gössling 2008; Peloza 2009). It provides the first systematic review of CS research focusing on energy companies. Additionally, my qualitative study extends research insights on CSM of previously weakly covered energy industries, so TSOs and municipalities, next to the more often examined O&G companies and electric utilities. My work sets the basis for future comparison of energy sector specific insights in CSM to CS areas and CSM components emphasized in other sectors. Furthermore, the CS system framework and gained research results allow proposing measures for enhancing CSM of energy companies in practice (chapter 6). Thus, I address the shortcoming of previously lacking guidance to practitioners on how to successfully manage CS engagement (Lindgreen et al. 2009b).

Despite offering relevant contributions, my work, like any research, faces limitations that are recommended to be alleviated in future studies.

Firstly, I focused at one point in time only. On the one hand, I used cross-sectional data in my quantitative study which prevented me from examining causalities. Thus, future studies using panel data should substantiate empirical results on the effects of systematically managed CS engagement and the moderating role of fit on CS-related performance. On the other hand, I gained only limited insights on fit. Building upon work by Maon et al. (2008) and Tang et al. (2012), longitudinal studies can illuminate how fit is established over time, which impacts it has and how it evolves. Examining fit over different time periods may not only advance research utilizing general systems theory. For

several theories of the firm, it is worth examining whether the short-term *exploitation* of resources goes in line with stronger fit at different CS system levels, and the long-term *exploration* coincides with less strong fit as control of resources to build new competencies.

Secondly, the narrow samples constitute limitations with 147 quantitatively and 8 qualitatively examined companies that were all large and active in the European Free Trade Association. Additional research with larger samples spanning companies of different sizes and regions is needed to verify whether my results may be generalized.

Thirdly, I decided to focus on the environmental CS dimension for my quantitative study. Thus, scholars are encouraged to repeat my study for all CS dimensions. Based on the meta-analysis by Orlitzky et al. (2003), the environmental dimension shows less strong associations with enhanced performance than the social CS dimension. Consequently, one may expect even stronger positive associations between systematic CSM and CSP.

As fourth limitation, I provided arguments on how the elements in the CS system may contribute to reaching implemented CS, but I do not empirically test them. Utilizing my arguments for developing hypotheses, scholars may provide according empirical results in future.

The fifth limitation of my work resides in general systems theory itself and the fact that I took a practice-oriented approach based on existing concepts, esp. attributes of social systems. General systems theory has contributed to social science, esp. by departing from a reductionist view in favor of an holistic view on companies, their interdependencies and dynamics for reaching outcomes (Mulej 2007; Ulrich 1984; Luhmann and Baecker 2017; Starik and Kanashiro 2013). Despite its relevant contributions, there are also shortcomings.

For example, operationalization of concepts remain insufficient like unclarities to examine a system's boundary or its elements' interactions (Oelsnitz 1994). Therefore, scholars are recommended to operationalize and continuously work out still weakly defined concepts related to social systems to progress CSM research using general systems theory further. Moreover, systems face the hardship that their interdependencies internally and externally are very hard to model which I also faced in my quantitative study. Future work needs to expand insights on measuring such interdependencies – including but not limited to building higher-order models in PLS-SEM. Additionally, systems tend to be rationalized ex-post (Oelsnitz 1994), i.e., that the existence of a system as outcome is utilized to derive determinants of this outcome. Instead of this approach, scholars would have to define determinants and develop hypotheses on how determinants shape a system's outcome in order to then examine empirically whether the hypotheses have to be rejected or not.

Next to these overall limitations in general systems theory, I focused on the research stream treating phenomena as systems. However, one cannot fully capture reality with all elements and their interactions with the outer environment (Knez-Riedl et al. 2006; Ulrich 1984). As such, the mentioned CS areas, CSM components and details on fit may not be complete. Any illustration of the CS system provided in this dissertation is a simplification of reality. Therefore, future research is not only recommended to extend my work but also to substantiate empirical evidence for the systems perspective in CS research.

Marking a particularly promising area for future research, it is worthwhile to pay larger attention on fit in CSM. I could only shed initial light on the moderating role of the different types of fit. Especially, horizontal coherence and company-external consistency are still to be examined for the first time in CS research to my best knowledge. Moreover, additional tests are needed on company-internal consistency and vertical coherence – the

latter with a potentially improved way of measurement. Additionally, the influence from different degrees of fit may attract scholarly attention, esp. additive positive (2+2=4) or synergistic positive (2+2>4) degrees of fit and their relative influence on CS-related performance. Chadwick (2010) points out methodological procedures for examining degrees of fit like advanced factor analyses for synergistic positive fit or analysis of variance for additive positive fit.

In addition, I see a promising path for future research in the equifinality of CS. Equifinality means that the "same final state may be reached from different initial conditions and in different ways" (von Bertalanffy 1950, p. 40). According to this definition, practitioners and scholars should not fall into the trap of declaring best-practice approaches and better or worse configurations of managing CS engagement. Rather, we need to better understand whether certain CSM components and CS areas prove to be common elements among companies and by which means CSM-related differentiation takes place. There are already promising research approaches for investigating equifinality which scholars in CSM research may build upon. Especially, Fiss (2011; 2007) has provided relevant insights on different configurations in organization research and their outcomes by using fuzzy set qualitative comparative analysis (in short fsQCA).

Moreover, additional influences on CSM and its outcomes are encouraged to be better captured. For doing so, the CS system framework offers a starting point. Although I focused on the company level in this dissertation, the CS system framework allows considering institutional influences like business environments as well as influences at individual level like single stakeholder expectations, managers' CS attitudes or knowledge on CSM (Delmas et al. 2007a; Sharma 2000; Hörisch et al. 2017; Hörisch et al. 2015a). Therefore, I re-emphasize past calls for more multi-level research (Bansal and Song 2017;

Starik and Kanashiro 2013). According to these authors, scholars will be able to shed further light on obtained CP from CS engagement by examining multi-level influences. I extend such claims by my elaboration on fit that will most likely also help explaining deviating empirical results in past studies on the relationship between CS engagement and CP. Having been weakly considered in past research (Aguinis and Glavas 2012), individual level influences seem particularly promising for extended insights. For this purpose, scholars may continue to combine CS and HR research (Voegtlin and Greenwood 2016). Having grounded the CS system in the well-established concept of HR systems, I have laid a foundation for such endeavors.

Last but not least, my work followed the CS research stream – not the converging yet distinct stream on CSR having a more normative position (Bansal and Song 2017). I re-emphasize the call by Bansal and Song (2017) for further research utilizing complementary insights of both streams. As such, the desirability of different CS systems can be explored using CSR knowledge, or irresponsible vs. responsible behaviors can be explained using a systems perspective from CS research.

All in all, I encourage scholars and practitioners to apply a systems perspective when managing CS engagement. It not only provides a comprehensive view on areas, components, fit and other influences but also helps explaining impacts on achieved outcomes like implemented CS and CS-related performance. Furthermore, I illustrate what this may mean for energy companies.

8 Appendix

List of appendices

Steps	1 Scope	2 Search database	3 Screen specia-lized journals	4 Screen potential sources						5 Read, extendsample		6 Code, analyze
Sub-steps, results	Scoping sample	Search result	Additional sources	Elimination by selection criteria	Elimination of duplicates	Elimination by title	Potential sample	Elimation by abstract	Pre-final sample	Additional sources	Elimination by reading	Final sample
Initial scoping study	**23**			**-19**			**4**		**4**			**4**
Databases (keywords in abstract: *sustain* OR *social* OR environment* OR CS* AND *perform* OR measur* OR competit* OR evaluat* OR business case AND energy* OR electri* OR renewable* OR utilit* OR suppl* OR oil* OR petrol* OR grid operat* OR gas* OR nuclear*)		**3,941**		**-3,574**	**-15**	**-213**	**139**	**-101**	**38**		**-3**	**35**
Subtotal Business Source Complete		407		-281	-5	-77	44	-28	16		-2	14
Subtotal ISI Web of Knowledge		3,408		-3,173	-9	-133	93	-72	21		-1	20
Subtotal ECONIS		126		-120	-1	-3	2	-1	1			1
Specialized journals			**72**	**-6**	**-10**		**56**	**-32**	**24**		**-4**	**20**
Cross-references, recommendation										**7**	**-1**	**6**
Total	**23**	**3,941**	**72**	**-3,599**	**-25**	**-213**	**199**	**-133**	**66**	**7**	**-8**	**65**

Appendix 1: Review procedure and results

Sources	Review question (sub-topic)	Research method	Theoretical background[1)]	Energy industry	Main findings	Shape of relationship[2)]
Mirvis 2000	CS management (areas, components)	Empirical qualitative	Stakeholder theory	O&G	Change process at Shell driven by economic and CS arguments; success w/ internal reflection and next generation managers	(Positive)
Sharma 2000	CS management (areas, components); performance impact (CSP)	Empirical quantitative	RBV	O&G	Managers seeing environmental issues as central to corp. identity and having decision power regard to env. issues as opportunity resulting in more voluntary environmental engagement	Positive, linear
Bansal and Roth 2000	CS management (areas, components); performance impact (CSP)	Empirical qualitative	Institutional theory, economic paradigm, value theory	O&G	Main contextual factors for environmental engagement motivation to gain competitiveness, legitimation, living firm's social responsibility	(Positive)
Kiernan 2001	Performance impact (CSP, CP)	Empirical quantitative		O&G; electric utilities	Positive relation between environmental activities and share price performance	Positive, linear
Kaptein and Wempe 2001	CS management (components)	Theoretical	Ethical theories	O&G	Outlined approach for CS mgmt. along PLAN, DO, CHECK, LEARN	(Positive)
Kleb 2002	CS management (areas, components); performance impact (CSP)	Empirical qualitative		O&G	CS evolution at SunCor Energy with increased role of stakeholder interests, change need, acceptance in society	(Positive)
Perceval 2003	CS management (areas, components)	Empirical qualitative	Shareholder theory, stakeholder theory	O&G	Approaches to integrating CS into company business by BP (deeply changing) and Shell (risk avoiding) for enhanced CSP evaluation	(Positive)
Schaefer 2004	CS management (areas, components); performance impact (CSP, CP)	Empirical qualitative		Electric utilities	CS implementation in multi-utility company for recognition to attract more business, legal requirements; key role of internal CS champions	(Positive)

Appendix 2: Overview of reviewed sources (hints: 1) Empty when no background mentioned; 2) For non-quantitative studies, only implied relationship in parentheses)

Sources	Review question (sub-topic)	Research method	Theoretical background[1)]	Energy industry	Main findings	Shape of relationship[2)]
Steger 2004	CS management (areas, components); performance impact (CSP, CP)	Empirical qualitative/ quantitative	Stakeholder theory	Energy industry	Sector-specific CS attitudes, issues, CSM structures, tools, processes; overall positive impact of CS engagement on corporate performance	Positive, linear (CSP), inverse U-shape (CP)
Salzmann 2004	CS management (areas, components); performance impact (CSP, CP)	Empirical qualitative/ quantitative	Stakeholder theory	O&G; electric utilities	Deep dive into O&G and electric utilities industries with specific CS attitudes, issues, CSM structures, tools, processes; overall positive impact of CS engagement on corporate performance	Positive, linear (CSP), inverse U-shape (CP)
DeBono 2004	CS management (areas, components)	Empirical qualitative		Electric utilities	Extension of environmental mgmt. system e.g., for strategic and financial planning / relationship mgmt. in Pacific Gas and Electric Company	(Positive)
Filbeck and Gorman 2004	Performance impact (CP)	Empirical quantitative		Electric utilities	Lower environmental performance leading to higher financial performance for electric utilities; positive influence of regulatory climate on relationship	Negative, linear
Krajnc and Glavič 2005	Performance impact (CSP)	Empirical qualitative		O&G	CSP measurement (own index) applied to BP and Shell showing that broad CS engagement, measurement shows higher CSP	(Positive)
Searcy 2005	CS management (areas, components); per-formance impact (CSP)	Empirical qualitative	Cycle of continuous improvement	TSO	Designed CSP indicator system for electric utility company	(Positive)
Bansal 2005	CS management (areas, components); per-formance impact (CSP)	Empirical quantitative	RBV, institutional theory	O&G	International experience, mimicry, media attention leading to higher CS engagement and, thus, CSP; lower influence of media attention over time	Positive, linear
Frynas 2005	CS management (areas, components)	Empirical qualitative		O&G	Best- and worst-case examples of local community development by O&G companies in developing countries	(Insignificant)

Appendix 2: Continued (hints: 1) Empty when no background mentioned; 2) For non-quantitative studies, only implied relationship in parentheses)

Sources	Review question (sub-topic)	Research method	Theoretical background[1)]	Energy industry	Main findings	Shape of relationship[2)]
Salzmann 2006	CS management (areas, components); performance impact (CSP, CP)	Empirical qualitative/ quantitative	Model by Wood (1991)	O&G; electric utilities	Drivers for more strategic CSM being relevance of CS issues, stakeholder pressure esp. from customers/investors, proactive manager attitudes, company factors like culture/relevance of social license to operate; more strategic CSM leading to higher CSP	Positive, linear
Perron et al. 2006	CS management (areas, components); performance impact (CSP)	Empirical qualitative		Municipalities	Positive impact of environmental education and awareness trainings of employees in two electric utilities (with and w/o such trainings)	(Positive)
Steger et al. 2007	CS management (areas, components); performance impact (CSP, CP)	Empirical qualitative/ quantitative	Stakeholder theory, shareholder theory, theory of firm	Energy industry	Manager opinion impacting business case, esp. lower relevance of issues and stakeholder demands reducing CSP and CP (vice versa); overall, positive impacts expected and shown in pilot companies with saturation over time	Positive, linear (CSP), inverse U-shape (CP)
Searcy et al. 2007	CS management (areas, components); performance impact (CSP)	Empirical qualitative		TSO	Designed CSP indicator system for electric utility company incl. priority area selection	(Positive)
Delmas et al. 2007a	Performance impact (CSP)	Empirical quantitative	Stakeholder theory	Electric utilities	Positive impact of mandatory environmental disclosure programs energy source mix, influenced by customer composition and prior fuel mix levels	Positive, linear
Delmas et al. 2007b	CS management (components); performance impact (CSP)	Empirical quantitative		Electric utilities	Deregulation impacts firm strategies and environmental differentiation, esp. with high environmental sensitivity among customers, low coal generation, lower productive efficiency	Positive, linear
Ziegler et al. 2007	Performance impact (CP)	Empirical quantitative		O&G; electric utilities	Positive impact of industry's average environmental performance on stock returns - but negative impact for social performance; insignificant relationship overall	Insignificant

Appendix 2: Continued (hints: 1) Empty when no background mentioned; 2) For non-quantitative studies, only implied relationship in parentheses)

Sources	Review question (sub-topic)	Research method	Theoretical background[1)]	Energy industry	Main findings	Shape of relationship[2)]
Thomas et al. 2007	Performance impact (CP)	Empirical quantitative		Electric utilities	TRUEVA as new measure for corporate performance incl. external environmental costs for selected companies; resulting need to use TRUEVA as more holistic performance indicator	Positive, linear
Idemudia 2007	CS management (areas, components)	Empirical qualitative	Stakeholder theory, psychological contract theory	O&G	Too diverse stakeholder expectations for O&G projects in Niger Delta with increased conflict between community and corporate world; need to reassess reasons of CS engagement to reach mutual beneficially perceived stakeholder relationships	(Positive)
Ketola 2007	CS management (areas, components)	Empirical qualitative	Various philo-sophical, psy-chological and managerial theories	O&G	Applied integrated, interdisciplinary model of CS mgmt. for highlighted types of CS engagement and resulting external perception	(Positive)
Andreassen Saverud and Skjarseth 2007	CS management (areas, components); per-formance impact (CSP)	Empirical qualitative		O&G	Compared CS strategy formulation and implementation of ExxonMobil (reactive), BP and Shell (more proactive) and resulting external perception	(Positive)
Searcy et al. 2008a	CS mgmt. (areas, com-ponents); performance impact (CSP, CP)	Empirical qualitative		TSO	Designed CSP indicator system for electric utility company; setting priorities for choosing indicators	(Positive)
Searcy et al. 2008b	CS management (areas, components); per-formance impact (CSP)	Empirical qualitative	System theory	TSO	Designed CSP indicator system for electric utility company; outlined characteristics of performance measurement and management systems	(Positive)
Vaaland and Heide 2008	CS management (areas, components)	Empirical qualitative	Industrial network theory	O&G	CS enforcement (long-term reduction of gaps btw. stakeholder expectations and CS) vs. incident recovery (short-term measures); one incident case by Statoil with few areas for improvement but positive effects of addressed incident	(Positive)

Appendix 2: Continued (hints: 1) Empty when no background mentioned; 2) For non-quantitative studies, only implied relationship in parentheses)

Sources	Review question (sub-topic)	Research method	Theoretical background[1)]	Energy industry	Main findings	Shape of relationship[2)]
Searcy et al. 2009	CS management (areas, components); per-formance impact (CSP)	Empirical qualitative		TSO	Designed CSP indicator system for electric utility company; learning on designing approach and selected indicators	(Positive)
Mio 2010	Performance impact (CSP)	Empirical qualitative/ quantitative	Control theory	Electric utilities	Varying, yet overall medium quality of CS reports of companies, esp. low materiality, inclusivity and balance; high level of timeliness, accuracy, reliability; medium comparability, completeness; resulting medium CSP for companies	Positive, linear
Bolton et al. 2011	CS management (areas, components)	Empirical qualitative	Stakeholder theory	O&G; electric utilities	Stressed relevance of employees in CS engagement with waves (initiation with 'why CS'; implementation with 'how to justify business against stakeholder claims'; maturation with 'how to create CS identity')	(Positive)
Epstein and Widener 2011	CS management (areas, components); per-formance impact (CSP)	Empirical qualitative	Stakeholder theory	O&G	Approach for stakeholder identification and definition of CSP indicators for gas reservoir of Shell; stressed relevance of detailed insights for impact / outcome evaluation, clear cause-and-effect relations	(Positive)
Lee et al. 2011	Performance impact (CP)	Empirical quantitative	Stakeholder theory, share-holder theory	O&G	Positive relation between higher Pacific Sustain-ability Index to CP; comparable low Pacific Sustainability Index for O&G companies	Positive, linear
Ekatah et al. 2011	Performance impact (CP)	Empirical quantitative		O&G	Positive relation between CSP indicators from Shell's CS reports of 5 years on financial performance	Positive, linear
Yuan et al. 2011	CS management (components)	Theoretical	Contingency theory, RBV	O&G	Outlined forms of fit in CS mgmt. to derive patterns for integration of recurring CS initiatives into existing business practices (e.g., born CS oriented, relabeling, thickening)	(Positive)

Appendix 2: Continued (hints: 1) Empty when no background mentioned; 2) For non-quantitative studies, only implied relationship in parentheses)

Sources	Review question (sub-topic)	Research method	Theoretical background[1)]	Energy industry	Main findings	Shape of relationship[2)]
Parast and Adams 2012	Performance impact (CSP, CP)	Empirical quantitative	Contingency theory, institutional theory, innovation diffusion	O&G	Positive relation from better quality management and CS practices to higher CSP; insignificant impact of CSP on corporate performance, maybe via higher internal quality results	Positive, linear (CSP), insignificant (CP)
Metaxas and Tsavdaridou 2012	CS management (areas, components)	Empirical qualitative		O&G; electric utilities	Many similarities in CS reports along CS policies and actions with environment showing standardized measurement; but differences in detail level or regularity with higher CSP perception for more detailed and regularly published CS reports	(Positive)
Hughey and Sulkowski 2012	Performance impact (CSP)	Empirical quantitative		O&G	Positive relation between greater CS data availability in CS reports and CSP (here reputation)	Positive, linear
Trapp 2012	CS management (areas, components); performance impact (CSP)	Empirical qualitative	CS frameworks on triple objectives	Electric utilities	CS marketing campaign by Vattenfall with overall positive impact, but limited credibility with claim to tackle climate change as sole company; improvement by communicating on business objectives and collaborating with NGOs	(Positive)
Mobus 2012	CS management (areas, components)	Empirical qualitative		O&G	Low credibility of CS reports by BP prior to incident at DeepWater Horizon platform given lack of lived (only claimed) culture of openness and continuous improvement; need for stricter CS reporting standards, company's proactive crisis prevention	(Positive)
Pätäri et al. 2012	Performance impact (CP)	Empirical quantitative	Stakeholder theory, shareholder theory, RBV	Energy industry	Positive relation between CSP (here DJSI) and financial performance	Positive, linear

Appendix 2: Continued (hints: 1) Empty when no background mentioned; 2) For non-quantitative studies, only implied relationship in parentheses)

Sources	Review question (sub-topic)	Research method	Theoretical background[1)]	Energy industry	Main findings	Shape of relationship[2)]
Du and Vieira 2012	CS management (areas, components)	Empirical qualitative		O&G	Diverse channels, topics, mechanisms like story-telling covered in CS communication to overcome image as 'controversial industry'; need for more transparency, proactive two-way communication and stakeholder dialogues	(Positive)
Cai et al. 2012	Performance impact (CP)	Empirical quantitative	Morality framework of leaders	O&G	Moral managers engage strategically in CS for supply chain mgmt. resulting in higher financial performance, also in 'controversial industries'	Positive, linear
Matos and Silvestre 2013	CS management (areas, components)	Empirical qualitative	Stakeholder theory	O&G; electric utilities	Approaches for local development in emerging markets by Petrobras and Electrobras; stressed need for NGOs and champions to build trust, education, sharing of benefits, avoided corruption, enhanced collaboration across companies	(Positive)
Glavas and Godwin 2013	CS management (areas, components); per-formance impact (CP)	Theoretical	Social identity theory, organizational identification theory	O&G	Proposed impact of perceived internal CS image on employees' identification, prestige, personal interest; proposed positive impact on corporate performance when internal CS image matches external CS image (CSP in ratings) due to larger organization identification (and vice versa)	(Positive)
García-Rodríguez et al. 2013	CS management (areas, components); per-formance impact (CSP)	Empirical qualitative		O&G	Positive effects from establishing environmental management system with international standard (ISO 14001) in Angolan company (incl. improved effects on its surroundings)	(Positive)
del Mar Alonso-Almeida et al. 2014	Performance impact (CSP)	Empirical qualitative		Energy industry	CS reporting with fast and high adoption rate of GRI (further increase in Europe, North America) serving as potential CSP indication for investors; energy companies focusing on environmental improvements in operations and benefits to communities	(Positive)

Appendix 2: Continued (hints: 1) Empty when no background mentioned; 2) For non-quantitative studies, only implied relationship in parentheses)

Sources	Review question (sub-topic)	Research method	Theoretical background[1)]	Energy industry	Main findings	Shape of relationship[2)]
Herbohn et al. 2014	Performance impact (CSP)	Empirical quantitative	Stakeholder theory	Energy industry	Strong positive relation between CS disclosure and CSP; energy companies not disclosing a lot in CS reports (improvements possible in external assurance for credibility, using international framework, performance development); CSP esp. driven by compliance, EHS systems	Positive, linear
Pätäri et al. 2014	Performance impact (CP)	Empirical quantitative	Stakeholder theory, share-holder theory, RBV	Energy industry	Positive relation between CSP (here DJSI) and financial performance; found time lag between CS activities and financial performance impacts	Positive, linear
Valenti et al. 2014	CS management (areas, components)	Empirical qualitative	Stakeholder theory	O&G	Approaches by Boeing and ExxonMobil along CS strategy being influenced by internal and external influences; leading to process and mgmt. systems; leading to performance	(Positive)
Graafland and Zhang 2014	CS management (areas, components); per-formance impact (CSP)	Empirical quantitative		Energy industry	Mostly used formal CS instruments in China; challenges in implementing CS instruments esp. lacking government and NGO support, fierce competition and high cost of CS, lack of skilled HR	Positive, linear
Raufflet et al. 2014	CS management (areas, components)	Empirical qualitative	Institutional theory, script research	O&G	Main institutional expectations on CS grouped to ethics & governance, environment, community relations, health & safety; O&G companies focusing on environment and health&safety; institutional scripts needed to ease comparing CS practices across companies	(Positive)
Poisson-de Haro and Bitektine 2015	CS management (areas, components); per-formance impact (CSP)	Empirical qualitative	Institutional theory, con-tingency theory, poli-tical theory	Electric utilities	Three companies with varying traditional sustainable energy mix; overall, effect on technical core tried to be limited by symbolic and early acts, non-market capabilities; gradual adjustment of technical core over time	(Positive)

Appendix 2: Continued (hints: 1) Empty when no background mentioned; 2) For non-quantitative studies, only implied relationship in parentheses)

Sources	Review question (sub-topic)	Research method	Theoretical background[1)]	Energy industry	Main findings	Shape of relationship[2)]
Pacheco and Dean 2015	Performance impact (CSP)	Empirical quantitative	Social movement theory, insti-tutional theory	Electric utilities	Positive relation between social movement pressures and CS engagement being moderated by degree of competitive actions and market dependence	Positive, linear
Stankova 2015	Performance impact (CSP)	Empirical quantitative	Stakeholder theory, share-holder theory	Electric utilities	CSP measurement (own approach) applied to selected companies showing that broad CS engagement shows higher CSP	Positive, linear
Ortiz-de-Mandojana and Aragon-Correa 2015	CS management (areas, components); performance impact (CSP)	Empirical qualitative	RBV, social capital theory, contingency theory	Electric utilities	Influence of company's advisory board with director interlocks being positively connected with environmental performance, esp. when being part of parent company and existing interlock diversity	(Insignificant)
Slack et al. 2015	CS management (components)	Empirical qualitative	Stakeholder theory, shareholder theory	Electric utilities	Employee engagement in CS impeded by both, employee and company factors; in investigated company, low degree of awareness of action areas, insufficient internal communication; also varying personal CS interests	(Positive)
Miras-Rodríguez et al. 2015	Performance impact (CP)	Empirical quantitative		Electric utilities	U-shaped relation between CS actions and financial performance; stand-alone, environmental actions w/o influence on financial performance, but diversity or employment or community actions as well as product-related actions w/ such influence on financial performance	U-shaped
Tian and Slocum 2016	CS management (areas, components)	Theoretical		O&G	Successful CS activities by global corporations in China considering local context / habits incl. Guanxi, engaging local stakeholders	(Positive)
Rogall et al. 2016	CS management (areas, components)	Theoretical		Electric utilities	Highlighted CS areas of relevance for electric utilities covering all dimensions and the energy value chain	(Positive)

Appendix 2: Continued (hints: 1) Empty when no background mentioned; 2) For non-quantitative studies, only implied relationship in parentheses)

Sources	Review question (sub-topic)	Research method	Theoretical background[1)]	Energy industry	Main findings	Shape of relationship[2)]
Wagner and Hense 2016	CS management (areas, components)	Theoretical		Munici-palities; DSO	Traditional focus on social CS dimensions by municipalities given ownership structures - extension to more business areas, environmental CS areas	(Positive)
Scheunemann 2016	CS management (components)	Theoretical		Energy industry	Improvement areas of energy companies' CS communication along bets practice criteria: authentic, proactive, interlinked with real measures, complementary to other communication, holistic, inductive, human- and society-oriented, value-based, reputation-enhancing, committed to truth, focused on company's business, transparent	(Positive)
Abro et al. 2016	CS management (areas, components)	Empirical qualitative		O&G	CS engagement by Saudi Aramco along CS dimensions (e.g., economic: largest employer, local partners and suppliers; social: basic education and health care; environment: internal energy efficiency/ environmental mgmt. system, biodiversity plan)	(Positive)

Appendix 2: Continued (hints: 1) Empty when no background mentioned; 2) For non-quantitative studies, only implied relationship in parentheses)

Components	Amount	Sources
CS-related strategy	15	Kleb 2002; Schaefer 2004; Matos and Silvestre 2013; Perceval 2003; Kaptein and Wempe 2001; Mirvis 2000; Valenti et al. 2014; Abro et al. 2016; Delmas et al. 2007; Andreassen Saverud and Skjarseth 2007; Bolton et al. 2011; Rogall et al. 2016;
CS-related structures and responsibilities	11	Salzmann 2006; Perceval 2003; Kaptein and Wempe 2001; Yuan et al. 2011; Wagner and Hense 2016; Abro et al. 2016; Andreassen Saverud and Skjarseth 2007; Raufflet et al. 2014; Schaefer 2004; Graafland and Zhang 2014; Scheunemann 2016
CS reporting	10	Schaefer 2004; Perceval 2003; Mobus 2012; DeBono 2004; Kaptein and Wempe 2001; Valenti et al. 2014; Mirvis 2000; Scheunemann 2016; Raufflet et al. 2014; del Mar Alonso-Almeida et al. 2014
External communication	9	Trapp 2012; DeBono 2004; Du and Vieira 2012; Mirvis 2000; Scheunemann 2016; Poisson-de Haro and Bitektine 2015; Idemudia 2007; Glavas and Godwin 2013; Ketola
Stakeholder management	9	Kleb 2002; Bolton et al. 2011; Perceval 2003; Idemudia 2007; Bansal 2005; Kaptein and Wempe 2001; Mirvis 2000; Scheunemann 2016; Epstein and Widener 2010
Environmental initiatives for pollution prevention	9	Poisson-de Haro and Bitektine 2015; Metaxas and Tsavdaridou 2012; Kleb 2002; DeBono 2004; Bansal 2005; Valenti et al. 2014; Sharma 2000; Raufflet et al. 2014; Wagner and Hense 2016
Environmental initiatives for pollution control	8	Poisson-de Haro and Bitektine 2015; Metaxas and Tsavdaridou 2012; Kleb 2002; DeBono 2004; Bansal 2005; Valenti et al. 2014; Sharma 2000; Raufflet et al. 2014
CS-related planning	9	Bolton et al. 2011; Perceval 2003; DeBono 2004; Kaptein and Wempe 2001; Ketola 2008; Yuan et al. 2011; Mirvis 2000; Rogall et al. 2016; García-Rodríguez et al. 2013
CS-related progress tracking	8	Searcy et al. 2007; Epstein and Widener 2010; Perceval 2003; Valenti et al. 2014; García-Rodríguez et al. 2013; Mirvis 2000; Yuan et al. 2011; Salzmann 2006
CS-enforcing corporate values and cultures	8	Kleb 2002; Mirvis 2000; Kaptein and Wempe 2001; Ketola 2008; Raufflet et al. 2014; Perron et al. 2006; Mobus 2012; Abro et al. 2016
Internal communication	8	Bolton et al. 2011; Schaefer 2004; Perceval 2003; DeBono 2004; Glavas and Godwin 2013; Mirvis 2000; Slack et al. 2015; Yuan et al. 2011
Initiatives to support local communities	8	Wagner and Hense 2016; Metaxas and Tsavdaridou 2012; Valenti et al. 2014; Abro et al. 2016; Matos and Silvestre 2013; Mirvis 2000; Frynas 2005; Raufflet et al. 2014
CS-related policies	7	Kaptein and Wempe 2001; Scheunemann 2016; Schaefer 2004; Perceval 2003; Yuan et al. 2011; Graafland and Zhang 2014; Abro et al. 2016
CS-related employee trainings, awareness initiatives	6	Perron et al. 2006; Matos and Silvestre 2013; Graafland and Zhang 2014; Bolton et al. 2011; García-Rodríguez et al. 2013; Raufflet et al. 2014
Standardized and certified management systems	6	DeBono 2004; Valenti et al. 2014; Graafland and Zhang 2014; Perceval 2003; Metaxas and Tsavdaridou 2012; García-Rodríguez et al. 2013
CS-related vision	6	Kaptein and Wempe 2001; Mirvis 2000; Bolton et al. 2011; Matos and Silvestre 2013; Perceval 2003; Raufflet et al. 2014
Initiatives fostering product stewardship	5	Bansal 2005; DeBono 2004; Matos and Silvestre 2013; Valenti et al. 2014; Raufflet et al. 2014
CS-related financial resource allocation	4	DeBono 2004; Glavas and Godwin 2013; Yuan et al. 2011; Andreassen Saverud and Skjarseth 2007
Handling of CS-related incidents	4	Mobus 2012; Vaaland and Heide 2008; Bolton et al. 2011; Valenti et al. 2014
Regular CS-related actitivities, processes	3	Salzmann 2006; Andreassen Saverud and Skjarseth 2007; Perceval 2003
CS-related partnerships	3	Matos and Silvestre 2013; Graafland and Zhang 2014; Frynas 2005
Initiatives enhancing employee health, safety, well-being	3	Valenti et al. 2014; Raufflet et al. 2014; Metaxas and Tsavdaridou 2012
CS-related performance evaluation, renumeration	3	Matos and Silvestre 2013; Yuan et al. 2011; Salzmann 2006
CS-related reviews	2	DeBono 2004; Kaptein and Wempe 2001
Initiatives securing human rights	2	Valenti et al. 2014; Raufflet et al. 2014
Initiatives along supply chain	2	Valenti et al. 2014; Raufflet et al. 2014
CS-related risk management	1	DeBono 2004
Initiatives fostering diversity	1	Valenti et al. 2014
Employee benefit program	1	Valenti et al. 2014
Monitored CS-related cost, benefit	1	Salzmann 2006

Appendix 3: CSM components in reviewed research

Overview of constructs and their measures					Measurement model assessment		
Con-struct	Item		Scale	Source	Collinearity VIF (<3)	Significance p-value of outer weights (<0.05)	Relevance Outer weights (rank like p-value)
CEP	CEP	Environmental rating	1.0 (lowest) - 4.0 (highest)	(oekom 2016a)	1.000	1.000	1.000
Philosophies	Phil_1	Our company has a clear policy statement urging environmental awareness in every area of operations.	1 (strongly disagree) - 5 (strongly disagree)	(López-Gamero et al. 2008; Banerjee 2002)	1.359	0.000	0.341
	Phil_2	Preserving the environment is a central value in our company.			1.303	0.000	0.451
	Phil_3	Management teams thoughout our company encourage and participate in environmental initiatives.			1.430	0.000	0.472
Policies	Pol_1	Improving our environmental impact is a strategic priority.	1 (strongly disagree) - 5 (strongly disagree)	(Bhupendra and Sangle 2016; Dögl and Holtbrügge 2013; Ervin et al. 2013; Perera Aldama et al. 2009; Branzei et al. 2004; Henriques and Sadorsky 1999)	1.281	0.000	0.437
	Pol_2	Our company has well-defined environmental goals.			1.191	0.000	0.264
	Pol_3	Our organization has an environmental officer at the senior management level.			1.174	0.000	0.286
	Pol_4	Our company has a board-level committee dealing with environmental issues, setting environmental policies and assessing environmental performance.			1.239	0.000	0.298
	Pol_5	Our company has formal teams in order to identify environmental problems and opportunities, and to suggest solutions at all levels.			1.138	0.000	0.269
Practices	Pract_1	Our company uses a structured approach to improve its environmental impact.	1 (strongly disagree) - 5 (strongly disagree)	(Bhupendra and Sangle 2016; López-Gamero et al. 2008)	1.345	0.000	0.371
	Pract_2	Financial and operational plans are elaborated in our company to foster progress on environmental issues.			1.357	0.000	0.325
	Pract_3	Procedures are defined and documented for all activities and processes which have a significant direct or indirect impact on the environment.			1.456	0.000	0.338
	Pract_4[1)]	Emergency procedures are established in order to respond to environmental problems and accidents.			n/a	n/a	n/a
	Pract_5	Savings and costs of environmental activities are quantified in the budget.			1.283	0.000	0.335

Appendix 4: Overview of constructs and measurement model assessment (measurement model assessment according to Hair et al. (2012b; 2017); hint: 1) Excluded given multiple respondents' remarks that not applicable in all industries)

Overview of constructs and their measures					Measurement model assessment		
Con-struct	Item		Scale	Source	Collinearity VIF (<3)	Significance p-value of outer weights (<0.05)	Relevance Outer weights (rank like p-value)
Processes	Proc_HR_1[2)]	Environmental performance is used in the evaluation...	1 (no one.); 2 (selected managers at executive level as mandatory criterion.); 3 (executives and managers with responsibility for a large environmental impact as mandatory criterion.); 4 (all managers as optional criterion.); 5 (all managers as mandatory criterion.)	(Bhupendra and Sangle 2016; Dögl and Holtbrügge 2013; Aragón-Correa 1998)	1.159	0.070	0.112
	Proc_HR_2[2)]	Employees are rewarded for their contribution to environmental goals...	1 (not at all.); 2 (sporadically without clear criteria.); 3 (frequently without clear criteria.); 4 (sporadically based on clear criteria.); 5 (frequently based on clear criteria.)		1.265	0.070	0.119
	Proc_HR_3	Our company conducts natural environmental trainings...	1 (for no one.); 2 (for employees on voluntary basis.); 3 (only for selected environmental experts on mandatory basis.); 4 (for all employees in units that have a large environmental impact on mandatory basis.); 5 (for all employees on mandatory basis.)		1.196	0.000	0.170
	Proc_TR_1	Periodic environmental audits are conducted…	1 (not at all.); 2 (for the company overall.); 3 (for few sites.); 4 (for the majority of sites that have a large environmental impact.); 5 (for all sites that have a large environmental impact.)	(Bhupendra and Sangle 2016; Perera Aldama et	2.199	0.000	0.297
	Proc_TR_2	An environmental management system is established...			1.969	0.000	0.304
	Proc_TR_3	In our company, environmental activities are monitored effectively.	1 (strongly disagree) - 5 (strongly disagree)		1.244	0.000	0.241

Appendix 4: Continued (hint: 2) excluded given lacking significance (also due to outer loadings ≤ 0.5))

Overview of constructs and their measures					Measurement model assessment		
Con-struct	Item		Scale	Source	Collinearity VIF (<3)	Significance p-value of outer weights (<0.05)	Relevance Outer weights (rank like p-value)
Processes (ctd.)	Proc_PS_1	Environmental analysis along the life cycle is conducted...	1 (not at all.); 2 (for selected products and services only.); 3 (for the majority of products and services.); 4 (for all products and services that have a large environmental impact.); 5 (for all products and services.)	(Banerjee 2002; Aragón-Correa 1998)	1.743677094	0	0.155
	Proc_PS_2	In developing products and services, our company ensures minimized environmental impact...			1.670	0.002	0.109
	Proc_CM_1	Please indicate frequency with which communica-tion informs employees about environmental activi-ties and need for environmentally friendly behavior.	1 (not at all); 2 (at hiring); 3 (every year); 4 (twice a year); 5 (quarterly); 6 (monthly)	(Weaver et al. 1999)	1.421	0.000	0.212
	Proc_CM_2	Barriers to environmental communication are removed and employees are encouraged to communicate with managers or other employees.	1 (strongly disagree) - 5 (strongly disagree)	(López-Gamero et al. 2008)	1.331	0.000	0.139
Coherence	Coher_1[3)]	In our company, stated environmental ambitions are selectively reflected in actions. (reverse coded)	1 (strongly disagree) - 5 (strongly disagree)	Constructed based on Helmig et al. 2016; Baumgartner 2014; Ketola 2008; Branzei et al. 2004 and interviews with 14 experts	n/a	n/a	n/a
	Coher_2	We regularly assess that our environmental objectives, plans and conducted activities are in line with our company's values and / or policies on this matter.			1.156	0.000	0.423
	Coher_3	Our company has mechanisms in place to detect, correct and if necessary punish business conduct violating our policy statement urging environmentally friendly behavior.			1.103	0.000	0.447
	Coher_4	In our company, we ensure that environment-related values and strategic goals are acted upon.			1.167	0.000	0.517
Consistency	Consist_1	Please choose the option that best describes your company.	1 (Environmental activities do not necessarily relate to the corporate strategy.); 3 (The corporate strategy is formulated to incorporate environmental activities.); 5 (Environmental activities are aligned with the corporate strategy after the corporate strategy has been set.)	(Bernatzky 2016; Perera Aldama et al. 2009)	1.163	0.000	0.410

Appendix 4: Continued (hint: 3) excluded given multiple respondents' remarks that misleading statement)

Overview of constructs and their measures					Measurement model assessment		
Con-struct	Item		Scale	Source	Collinearity VIF (<3)	Significance p-value of outer weights (<0.05)	Relevance Outer weights (rank like p-value)
Consistency (ctd.)	Constist_2	Our company has integrated environmental issues into the strategic planning process.	1 (strongly disagree) - 5 (strongly disagree)	(Bhupendra and Sangle 2016; Chang 2011; Buysse and Verbeke 2003)	1.355	0.000	0.456
	Consist_3	Environmental investments and procurement are part of our company's budget planning.			1.190	0.000	0.373
	Consist_4	In our organization, production processes and / or technologies are redesigned to match environmental pollution prevention goals.			1.121	0.000	0.286
Controls	Size	Natural logarithm of number of employees	Natural logarithm	(Torugsa et al. 2013; Kang 2013; Aragón-Correa 1998)	1.000	1.000	1.000
	Industry	GICS code	10-223 (arbitrary code)		1.000	1.000	1.000
	Region	Country of headquarter	1-10 (arbitrary code)		1.000	1.000	1.000
	Financial performance	Average return on equity ratio 2013-2015	0-1		1.000	1.000	1.000
	Solvency	Average free cash flow 2013-2015	Natural logarithm		1.000	1.000	1.000
	Experience	Please indicate since when your company is substantially engaged in corporate environmental management.	1 (0-3years); 2 (4-7 years); 3 (8-11 years); 4 (12-15 years); 5 (more than 15 years)		1.000	1.000	1.000
	Social performance	Social rating	1.0 (lowest) - 4.0 (highsest)	(oekom 2016a)	1.000	1.000	1.000
	Environmental attitude	Humans are severely abusing the environment.	1 (strongly disagree) - 5 (strongly disagree)	(Dunlap et al. 2000)	1.000	1.000	1.000
	Gender	Please indicate your gender.	Female; Male; Not provided	(Raineri and Paillé 2016; Peterson 2004)	1.000	1.000	1.000
	Work duration	Please indicate for how long you have been working for this company.	1 (less than 4 years); 2 (4-9 years); 3 (10-15 years); 4 (16-20 years); 5 (21 years or more); Not provided		1.000	1.000	1.000

Appendix 4: Continued

Con-struct	Item		Scale
Philosophies	Phil_1	Unser Unternehmen hat eine Leitlinie, die Umweltbewusstsein in allen Bereichen forciert.	1 (stimme gar nicht zu) - 5 (stimme voll und ganz zu)
	Phil_2	Die Erhaltung der Umwelt ist ein zentraler Wert in unserem Unternehmen.	
	Phil_3	Management-Teams überall in unserem Unternehmen fördern Umweltinitiativen und nehmen daran teil.	
Policies	Pol_1	Die Verbesserung unserer Umweltauswirkungen hat strategische Priorität.	1 (stimme gar nicht zu) - 5 (stimme voll und ganz zu)
	Pol_2	Unser Unternehmen hat gut definierte Umweltziele.	
	Pol_3	Unser Unternehmen hat einen Umweltbeauftragten auf hoher Führungsebene.	
	Pol_4	Unser Unternehmen besitzt einen Ausschuss auf Vorstandsebene, der sich mit Umweltbelangen befasst, unternehmensweite Umweltrichtlinien definiert und die Umwelt-Performance auswertet.	
	Pol_5	Unser Unternehmen hat formal definierte Teams auf allen Hierarchiestufen, die Umweltprobleme und -chancen erkennen und Lösungen erarbeiten.	
Practices	Pract_1	Das Unternehmen hat einen strukturierten Ansatz, um seine Umweltauswirkungen zu verbessern.	1 (stimme gar nicht zu) - 5 (stimme voll und ganz zu)
	Pract_2	Finanzielle und operative Pläne werden erarbeitet, um Fortschritte in Umweltbelangen zu forcieren.	
	Pract_3	Abläufe sind definiert und dokumentiert für alle Aktivitäten und Prozesse, die signifikante direkte oder indirekte Umweltauswirkungen haben.	
	Pract_4	Vorgehensweisen für Notfallsituationen sind etabliert, um auf Umweltprobleme und Unfälle mit Umweltauswirkungen zu reagieren.	
	Pract_5	Einsparungen durch und Kosten von Umweltaktivitäten sind im Budget quantifiziert.	
Processes	Proc_HR_1	Die Umwelt-Performance wird berücksichtigt für die Beurteilung von…	1 (niemandem.); 2 (ausgewählten Vorstandsmitgliedern als verpflichtendes Kriterium.); 3 (Vorstand / Führungskräften von Bereichen mit großen Umweltaus-wirkungen als verpflichtendes Kriterium.); 4 (allen Führungskräften als optionales Kriterium.); 5 (allen Führungskräften als verpflichtendes Kriterium.)
	Proc_HR_2	Mitarbeiter werden für ihren Beitrag zu Umweltzielen ...	1 (gar nicht belohnt.); 2 (unregelmäßig ohne klare Kriterien belohnt.); 3 (regelmäßig ohne klare Kriterien belohnt.); 4 (unregelmäßig nach klaren Kriterien belohnt.); 5 (regelmäßig nach klaren Kriterien belohnt.)

Appendix 5: German survey items

Con-struct	Item		Scale
Processes (ctd.)	Proc_HR_3	Unser Unternehmen führt umweltbezogene Trainings...	1 (gar nicht durch.); 2 (für Mitarbeiter auf freiwilliger Basis durch.); 3 (nur für Umwelt-Experten unter den Mitarbeitern verpflichtend durch.); 4 (für alle Mitarbeiter in Einheiten mit großer Umweltauswirkung verpflichtend durch.); 5 (für alle Mitarbeiter verpflichtend durch.)
	Proc_TR_1	Regelmäßige Umweltaudits werden…	1 (gar nicht durchgeführt.); 2 (übergeordnet für das Unternehmen durchgeführt.); 3 (für einzelne Standorte durchgeführt.); 4 (für die Mehrheit der Standorte durchgeführt, die große Umweltaus-wirkungen haben.); 5 (für alle Standorte durchgeführt, die große Umweltauswirkungen haben.)
	Proc_TR_2	Ein Umweltmanagementsystem ist...	1 (gar nicht etabliert.); 2 (für das Unternehmen übergeordnet etabliert.); 3 (für einzelne Standorte etabliert.); 4 (für die Mehrheit der Standorte etabliert, die große Umweltauswirkungen haben.); 5 (für alle Standorte etabliert, die große Umweltauswirkungen haben.)
	Proc_TR_3	In unserem Unternehmen werden Umweltaktivitäten effektiv überwacht.	1 (stimme gar nicht zu) - 5 (stimme voll und ganz zu)
	Proc_PS_1	Analysen zu Umweltauswirkungen entlang des Lebenszyklus werden...	1 (gar nicht durchgeführt.); 2 (für wenige Produkte und Dienstleistungen durchgeführt.); 3 (für die Mehrheit der Produkte und Dienstleistungen durchgeführt.); 4 (für alle Produkte und Dienstleistungen durchgeführt, die große Umweltauswirkungen haben.); 5 (für alle Produkte und Dienstleistungen durchgeführt.)
	Proc_PS_2	In der Entwicklung von Produkten und Dienstleistungen achtet unser Unternehmen darauf, die Umweltauswirkungen zu minimieren...	1 (in keinem Fall.); 2 (für wenige Produkte und Dienstleistungen.); 3 (für die Mehrheit der Produkte und Dienstleistungen.); 4 (für alle Produkte und Dienstleistungen, die große Umweltauswirkungen haben.); 5 (für alle Produkte und Dienstleistungen.)
	Proc_CM_1	Bitte geben Sie die Häufigkeit an, mit der Mitarbeiter durch Kommunikation über Umweltaktivitäten und ein umweltfreundliches Verhalten informiert werden.	1 (gar nicht); 2 (bei Firmeneintritt); 3 (jährlich); 4 (halbjährlich); 5 (quartalsweise); 6 (monatlich)
	Proc_CM_2	Hürden für die Kommunikation zu Umweltbelangen sind beseitigt und Mitarbeiter werden ermutigt, mit ihren Vorgesetzten oder anderen Mitarbeitern zu sprechen.	1 (stimme gar nicht zu) - 5 (stimme voll und ganz zu)
Coherence	Coher_1	In unserem Unternehmen spiegeln sich umweltbezogene Ambitionen vereinzelt in Handlungen wider. (reverse coded)	1 (stimme gar nicht zu) - 5 (stimme voll und ganz zu)
	Coher_2	Wir überprüfen regelmäßig, dass unsere Umweltziele, -pläne und -aktivitäten den umweltbezogenen Werten bzw. Leitlinien unseres Unternehmens entsprechen.	
	Coher_3	Unser Unternehmen besitzt Mechanismen, um Geschäftsverhalten, das den Leitlinien für umweltbewusstes Verhalten widerspricht, zu identifizieren, zu korrigieren und wenn nötig zu bestrafen.	
	Coher_4	Wir stellen in unserem Unternehmen sicher, dass entsprechend der umweltbezogenen Werte und strategischen Ziele gehandelt wird.	

Appendix 5: Continued

Con-struct	Item		Scale
Consistency	Consist_1	Bitte wählen Sie die Aussage, die Ihr Unternehmen am besten beschreibt.	1 (Umweltaktivitäten stehen nicht zwingend in Beziehung zur Unternehmensstrategie.); 3 (Umweltaktivitäten werden an die Unternehmensstrategie angepasst, nachdem die Unternehmensstrategie festgelegt wurde.); 5 (Die Unternehmensstrategie ist so formuliert, dass sie Umweltaktivitäten beinhaltet.)
	Constist_2	Unser Unternehmen integriert Umweltbelange in seinen strategischen Planungsprozess.	1 (stimme gar nicht zu) - 5 (stimme voll und ganz zu)
	Consist_3	Umweltbezogene Investitionen und Beschaffungen sind Teil der Budget-Planung unseres Unternehmens.	
	Consist_4	Die Produktionsprozesse und / oder -technologien unseres Unternehmens sind angepasst, um die Umweltziele zu erreichen.	
Controls	Experience	Bitte geben Sie an, seit wann Ihr Unternehmen im Umweltmanagement aktiv ist.	1 (0-3 Jahre); 2 (4-7 Jahre); 3 (8-11 Jahre); 4 (12-15 Jahre); 5 (mehr als 15 Jahre); Keine Angabe
	Environm. attitude	Menschen missbrauchen die Natur massiv.	1 (stimme gar nicht zu) - 5 (stimme voll und ganz zu)
	Gender	Bitte geben Sie Ihr Geschlecht an.	Weiblich; Männlich; Keine Angabe
	Work duration	Bitte geben Sie an, seit wann Ihr Unternehmen im Umweltmanagement aktiv ist.	1 (weniger als 4 Jahre); 2 (4-9 Jahre); 3 (10-15 Jahre); 4 (16-20 Jahre); 5 (mehr als 21 Jahre); Keine Angabe

Appendix 5: Continued

	Item	Mean	St. dev.	Skewness	Kurtosis	VIF	1	2	3	4	5
1	CEP	2.094	0.510	0.354	-0.144		1.000				
2	Phil_1	4.173	0.827	-0.947	0.886	1.872	0.340***	1.000			
3	Phil_2	3.755	0.777	-0.319	-0.111	1.969	0.412***	0.456***	1.000		
4	Phil_3	3.684	0.779	-0.345	0.314	1.804	0.459***	0.443***	0.451***	1.000	
5	Pol_1	4.092	0.752	-0.551	0.052	2.631	0.623***	0.441***	0.438***	0.426***	1.000
6	Pol_2	3.908	0.625	-0.265	0.448	1.776	0.365***	0.285***	0.259***	0.380***	0.263***
7	Pol_3	3.905	0.869	-0.640	0.213	1.821	0.394***	0.199**	0.376***	0.283***	0.349***
8	Pol_4	3.497	0.982	-0.535	-0.099	1.933	0.440***	0.225***	0.269***	0.310***	0.318***
9	Pol_5	3.915	0.777	-1.110	2.316	1.712	0.400***	0.303***	0.244***	0.313***	0.251***
10	Pract_1	4.088	0.664	-0.295	-0.207	2.257	0.592***	0.291***	0.255***	0.299***	0.435***
11	Pract_2	3.803	0.653	-0.225	0.129	2.007	0.511***	0.351***	0.317***	0.359***	0.508***
12	Pract_3	3.755	0.743	-0.483	0.182	1.940	0.532***	0.123	0.202**	0.252***	0.410***
13	Pract_5	3.619	0.722	-0.370	0.008	1.872	0.487***	0.301***	0.239***	0.315***	0.392***
14	Proc_PS_1	2.575	0.816	0.081	-0.552	2.208	0.311***	0.157	0.153	0.235***	0.195**
15	Proc_PS_2	3.629	0.800	0.036	-0.538	2.267	0.220***	0.220***	0.225***	0.188**	0.155
16	Proc_HR_3	3.265	0.826	-0.623	0.064	1.550	0.306***	0.330***	0.236***	0.294***	0.192**
17	Proc_TR_1	3.728	0.928	-0.370	-0.660	3.050	0.578***	0.142	0.220***	0.215***	0.336***
18	Proc_TR_2	3.469	1.191	-0.281	-1.043	2.598	0.605***	0.193**	0.234***	0.227***	0.318***
19	Proc_TR_3	4.204	0.613	-0.214	-0.470	1.664	0.499***	0.165**	0.209**	0.189**	0.318***
20	Proc_CM_1	4.068	1.096	-0.168	-0.450	1.978	0.357***	0.227***	0.236***	0.241***	0.363***
21	Proc_CM_2	3.980	0.633	-0.354	0.509	1.785	0.285***	0.198**	0.189**	0.234***	0.259***
22	Consist_1	3.735	1.262	-0.480	-0.644	1.760	0.445***	0.290***	0.304***	0.222***	0.373***
23	Consist_2	3.650	0.676	-0.291	0.004	2.195	0.499***	0.391***	0.333***	0.429***	0.488***
24	Consist_3	3.520	0.697	-0.120	-0.182	1.596	0.368***	0.114	0.186**	0.178**	0.174**
25	Consist_4	3.946	0.712	-0.152	-0.426	1.582	0.276***	0.037	0.034	0.108	0.217***
26	Coher_2	3.918	0.630	-0.124	-0.093	1.771	0.321***	0.134	0.142	0.260***	0.343***
27	Coher_3	3.772	0.612	-0.320	0.522	1.698	0.306***	0.238***	0.140	0.180**	0.256***
28	Coher_4	3.935	0.698	-0.440	0.277	2.029	0.389***	0.185**	0.155	0.294***	0.269***
Controls											
29	Env. attitude	4.167	0.849	-1.575	3.417	1.692	0.070	0.170**	0.169**	0.184**	0.134
30	Gender	1.442	0.498	0.236	-1.973	1.341	0.093	-0.004	-0.048	-0.004	0.060
31	Work duration	2.712	1.065	0.526	-0.119	1.534	0.047	0.049	0.034	0.100	0.104
32	Experience	3.578	1.244	-0.344	-1.053	1.602	0.294***	0.191**	0.183**	0.240***	0.189**
33	Social performance	2.076	0.392	-0.249	-0.907	2.321	0.671***	0.337***	0.317***	0.419***	0.393***
34	Region	5.789	3.143	0.118	-1.467	1.436	-0.050	0.029	-0.091	-0.021	0.060
35	Industry	11.031	6.934	0.243	-1.331	1.775	0.168**	-0.093	0.087	0.013	-0.091
36	Size	9.570	1.511	0.008	-0.352	2.432	0.305***	0.130	0.163**	0.258***	0.166**
37	Financial performance	0.110	0.339	-8.812	94.994	1.303	0.077	-0.031	0.102	0.059	0.054
38	Solvency	19.166	1.573	0.303	0.872	2.185	0.297***	0.049	0.124	0.130	0.174**

Appendix 6: Descriptive statistics and correlations at item-level (VIF = variance inflation factors; correlations using Spearmans rho; * p≤0.1, ** p≤0.05, *** p≤0.001 (two-tailed))

	Item	6	7	8	9	10	11	12	13	14	15
1	CEP										
2	Phil_1										
3	Phil_2										
4	Phil_3										
5	Pol_1										
6	Pol_2	1.000									
7	Pol_3	0.168**	1.000								
8	Pol_4	0.311***	0.287***	1.000							
9	Pol_5	0.293***	0.220***	0.172**	1.000						
10	Pract_1	0.249***	0.253***	0.338***	0.304***	1.000					
11	Pract_2	0.143	0.298***	0.319***	0.296***	0.397***	1.000				
12	Pract_3	0.232***	0.119	0.328***	0.252***	0.434***	0.378***	1.000			
13	Pract_5	0.325***	0.099	0.303***	0.146	0.270***	0.385***	0.418***	1.000		
14	Proc_PS_1	0.186**	0.049	0.303***	0.202**	0.204**	0.233***	0.208**	0.119	1.000	
15	Proc_PS_2	0.119	0.076	0.308***	0.245***	0.148	0.263***	0.190**	0.135	0.618***	1.000
16	Proc_HR_3	0.327***	0.173**	0.202**	0.264***	0.238***	0.272***	0.162	0.238***	0.212**	0.207**
17	Proc_TR_1	0.337***	0.308***	0.330***	0.326***	0.413***	0.327***	0.332***	0.303***	0.153	0.136
18	Proc_TR_2	0.321***	0.307***	0.305***	0.241***	0.434***	0.305***	0.277***	0.335***	0.154	0.108
19	Proc_TR_3	0.215***	0.301***	0.236***	0.289***	0.329***	0.324***	0.331***	0.321***	0.124	0.128
20	Proc_CM_1	0.266***	0.228***	0.303***	0.310***	0.382***	0.330***	0.340***	0.247***	0.153	0.136
21	Proc_CM_2	0.231***	0.199**	0.330***	0.084	0.258***	0.279***	0.261***	0.184**	0.273***	0.163**
22	Consist_1	0.219***	0.343***	0.179**	0.211**	0.281***	0.325***	0.251***	0.235***	0.061	0.085
23	Consist_2	0.278***	0.130	0.376***	0.381***	0.392***	0.479***	0.429***	0.349***	0.183**	0.179**
24	Consist_3	0.086	0.213***	0.275***	0.258***	0.226***	0.267***	0.310***	0.192**	0.070	0.103
25	Consist_4	0.135	0.034	0.134	0.060	0.271***	0.180**	0.356***	0.187**	0.079	0.009
26	Coher_2	0.139	0.251***	,188*	0.240***	0.262***	0.397***	0.294***	0.280***	0.140	0.,210**
27	Coher_3	0.193**	0.171**	0.263***	0.224***	0.344***	0.330***	0.303***	0.284***	0.125	0.137
28	Coher_4	0.153	0.102	0.279***	0.332***	0.334***	0.455***	0.405***	0.353***	0.153	0.,217***
Controls											
29	Env. attitude	0.062	0.141	0.056	0.107	0.036	0.061	-0.009	0.035	0.052	0.076
30	Gender	0.034	-0.142	-0.155	0.133	0.070	0.111	0.078	0.044	0.101	0.109
31	Work duration	0.112	0.227***	0.219***	0.054	0.074	0.033	-0.049	-0.067	-0.066	-0.123
32	Experience	0.247***	0.169**	0.073	0.144	0.216***	0.112	0.078	0.192**	-0.027	-0.010
33	Social performance	0.319***	0.379***	0.377***	0.333***	0.325***	0.412***	0.284***	0.315***	0.292***	0.217***
34	Region	0.012	-0.018	-0.094	-0.185**	-0.169**	-0.105	-0.017	-0.062	0.016	-0.103
35	Industry	0.021	-0.017	0.043	-0.083	0.067	-0.031	0.171**	0.150	-0.045	-0.011
36	Size	0.151	0.346***	0.215***	0.075	0.258***	0.155	0.123	0.161	0.171**	0.054
37	Financial performance	0.074	0.009	0.014	0.121	0.056	0.049	0.039	-0.075	0.037	-0.063
38	Solvency	0.112	0.288***	0.233***	-0.036	0.174**	0.154	0.164**	0.155	0.130	-0.076

Appendix 6: Continued

	Item	16	17	18	19	20	21	22	23	24	25
1	CEP										
2	Phil_1										
3	Phil_2										
4	Phil_3										
5	Pol_1										
6	Pol_2										
7	Pol_3										
8	Pol_4										
9	Pol_5										
10	Pract_1										
11	Pract_2										
12	Pract_3										
13	Pract_5										
14	Proc_PS_1										
15	Proc_PS_2										
16	Proc_HR_3	1.000									
17	Proc_TR_1	0.277***	1.000								
18	Proc_TR_2	0.259***	0.705***	1.000							
19	Proc_TR_3	0.250***	0.411***	0.383***	1.000						
20	Proc_CM_1	0.260***	0.387***	0.268***	0.217***	1.000					
21	Proc_CM_2	0.197**	0.145	0.229***	0.161	0.420***	1.000				
22	Consist_1	0.179**	0.289***	0.417***	0.170**	0.219***	0.301***	1.000			
23	Consist_2	0.293***	0.301***	0.306***	0.228***	0.392***	0.291***	0.346***	1.000		
24	Consist_3	0.174**	0.185**	0.186**	0.189**	0.115	0.125	0.075	0.333***	1.000	
25	Consist_4	0.161	0.127	0.046	0.088	0.138	0.135	-0.010	0.233***	0.261***	1.000
26	Coher_2	0.156	0.341***	0.260***	0.238***	0.239***	0.155	0.204**	0.330***	0.185**	0.146
27	Coher_3	0.166**	0.250***	0.267***	0.098	0.250***	0.293***	0.275***	0.319***	0.213***	0.171**
28	Coher_4	0.167**	0.266***	0.126	0.244***	0.302***	0.210**	0.182**	0.438***	0.213***	0.290***
Controls											
29	Env. attitude	0.052	-0.014	-0.041	0.004	0.014	0.205**	0.058	0.099	0.090	0.044
30	Gender	-0.032	-0.026	-0.042	0.005	-0.043	-0.024	-0.054	-0.039	-0.115	0.161
31	Work duration	0.089	0.215**	0.184**	0.025	0.073	0.088	0.089	0.109	0.095	-0.052
32	Experience	0.176**	0.291***	0.389***	0.192**	0.159	0.148	0.269***	0.212**	0.057	0.008
33	Social performance	0.303***	0.455***	0.433***	0.413***	0.204**	0.222***	0.194**	0.320***	0.267***	0.191**
34	Region	0.000	-0.147	-0.030	-0.058	-0.066	0.064	0.002	0.056	-0.101	-0.037
35	Industry	0.040	0.029	0.111	-0.020	-0.070	-0.001	0.041	0.058	0.172**	0.163**
36	Size	0.080	0.213***	0.265***	0.174**	0.023	0.202**	0.271***	0.241***	0.084	0.074
37	Financial performance	-0.097	0.092	0.087	0.012	0.012	0.104	0.030	0.087	0.048	0.005
38	Solvency	0.146	0.237***	0.249***	0.273***	0.084	0.062	0.154	0.126	-0.007	0.170**

Appendix 6: Continued

	Item	26	27	28		29	30	31	32	33	34	35	36	37	38
1	CEP														
2	Phil_1														
3	Phil_2														
4	Phil_3														
5	Pol_1														
6	Pol_2														
7	Pol_3														
8	Pol_4														
9	Pol_5														
10	Pract_1														
11	Pract_2														
12	Pract_3														
13	Pract_5														
14	Proc_PS_1														
15	Proc_PS_2														
16	Proc_HR_3														
17	Proc_TR_1														
18	Proc_TR_2														
19	Proc_TR_3														
20	Proc_CM_1														
21	Proc_CM_2														
22	Consist_1														
23	Consist_2														
24	Consist_3														
25	Consist_4														
26	Coher_2	1.000													
27	Coher_3	0.226***	1.000												
28	Coher_4	0.316***	0.274***	1.000											
Controls															
29	Env. attitude	0.015	0.133	0.131		1.000									
30	Gender	0.105	0.039	0.155		0.001	1.000								
31	Work duration	0.084	-0.027	-0.042		0.074	-0.213**	1.000							
32	Experience	0.039	0.130	0.031		0.028	-0.113	0.245***	1.000						
33	Social performance	0.282***	0.254***	0.291***		0.127	0.070	0.029	0.192**	1.000					
34	Region	-0.140	0.056	-0.067		-0.003	-0.049	0.066	0.037	-0.076	1.000				
35	Industry	0.222***	0.029	0.136		-0.152	-0.007	0.020	0.041	0.050	-0.043	1.000			
36	Size	0.021	0.069	0.068		0.092	-0.112	0.199**	0.255***	0.405***	0.084	-0.143	1.000		
37	Financial performance	-0.086	-0.043	0.062		0.029	-0.046	0.101	0.024	0.066	0.219***	-0.077	0.109	1.000	
38	Solvency	0.082	0.058	0.069		-0.034	0.013	0.099	0.163**	0.439***	0.106	-0.086	0.610***	-0.005	1.000

Appendix 6: Continued

	Model 1	Model 2	Model 3
Insignificant d_G for estimated model	Met (p = 0.054)	Not met (p = 0.046)	Not met (p = 0.0626)
SRMR ≤ 0.080	Met (0.059)	Met (0.058)	Met (0.061)
RMS_{theta} ≤ 0.120-0.140	Met (0.129)	Met (0.126)	Met (0.123)
NFI > 0.950	Not met (0.785)	Not met (0.771)	Not met (0.755)

Appendix 7: Results of model fit assessment (SRMR = Standardized root mean square residual; RMS_{theta} = Root mean square residual covariance; NFI = Normed fit index; criteria and thresholds based on Dijkstra and Henseler 2015; Henseler et al. 2014; Lohmüller 1989)

Measurement model assessment							
Con-struct	Item		Scale	Source	Collinearity VIF (<3)	Significance p-value of outer weights (<0.05)	Relevance Outer weights (rank like p-value)
CEP	CEP	Environmental rating	1.0 (lowest) - 4.0 (highest)	(oekom 2016a)	1.000	1.000	1.000
Respondents' CEP	Env. impact_1	Our company's record footprint on the natural environment is better. / Der Fußabdruck unseres Unternehmens auf die natürliche Umwelt ist besser.	1 (strongly disagree) - 5 (strongly disagree) / 1 (stimme gar nicht zu) - 5 (stimme voll und ganz zu)	(Dögl and Holtbrügge 2013; Branzei et al. 2004)	1.077	0.000	0.757
	Env. impact_2	External ratings or rankings concerning environmental performance evaluate the our company less favorably. / Externe Ratings oder Rankings der Umwelt-Performance bewerten unser Unternehmen weniger positiv. (reverse coded)			1.017	0.001	0.563
	Env. impact_3[1)]	Our organization's contribution to environmental damage is small and hardly makes any difference. / Der Beitrag unseres Unternehmens zur Umweltzerstörung ist gering und macht kaum einen Unterschied.			1.060	0.104	-0.357

Structural model assessment				
Path to CEP	**ß**	**S. D.**	**p-value**	**f^2**
Respondents' CEP	0.166	0.057	**	0.044

Appendix 8: Robustness check for social desirability bias (**p≤0.05 (two-tailed); 0.000 due to rounding)

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