

Coverage of G4-indicators in GRI-sustainability reports by electric utilities

GRI-
sustainability
reports by
electric utilities

359

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Abstract

Purpose – Electric utility companies (EUC) are expected to play a key role toward implementing ambitious climate change aims being under critical scrutiny by regulators and stakeholders. However, EUC provide an under-researched field regarding sustainability reporting with the focus on economic, social and ecological concerns. This paper aims to gain insights of the sustainability reporting practice of EUC and the coverage of indicators based on the Global Reporting Initiative (GRI)-Guidelines.

Design/methodology/approach – A twofold documentary analysis of 186 GRI-G4 sustainability reports by EUC globally is conducted to investigate the coverage rates of G4-indicators. Neo-institutionalism and strategic stakeholder theory serve as theoretical lenses. A regression analysis is used to examine ownership, stock-exchange listing, area of activity and region as potential drivers of sustainability reporting.

Findings – Results show that the coverage of indicators based on triple-bottom-line dimensions is moderate in EUC leaving room for improvement. The coverage of sector-specific indicators lacks behind the coverage of standard disclosure indicators. Results show that private and listed EUC show better coverage rates than public and not-listed EUC.

Research limitations/implications – Neo-institutionalism shows limited homogenization in the sector. Strategic stakeholder theory demonstrates insufficient stakeholder compliance of public and not-listed EUC.

Originality/value – This study contributes to sustainability reporting research by focusing on the under-researched electricity sector. It provides practical reporting insights for EUC, the GRI and regulators.

Keywords Sustainability reporting, Electric utilities, Global reporting initiative, Regression analysis, Neo-institutionalism, Strategic stakeholder theory

Paper type Research paper

1. Motivation and research objectives

Within the last decades and due to globalization, climate change, increasing environmental pollution and the scarcity of resources, companies experienced increased stakeholder pressure to disclose information not only on financial (economic) performance but also on ecological and social aspects (Boiral *et al.*, 2019; Sartori *et al.*, 2017; Garcia *et al.*, 2016; Fernandez-Feijoo *et al.*, 2014) along the Triple-Bottom-Line (TBL) dimensions (Elkington, 1997). As a reaction and to gain, maintain or regain legitimacy and reputation (Deegan, 2014), sustainability reporting is becoming an institutionalized practice, especially in private and stock-exchange listed companies (Traxler and Greiling, 2018; Brown *et al.*, 2009). Studies show that the public and the non-profit sectors are lagging behind implementing and disclosing TBL-information in sustainability reports (SR) (Traxler and Greiling, 2018; Lock and Seele, 2016; Greiling *et al.*, 2015a, b). This is contradictory to expectations that the public sector, as steward of public interests and welfare, should take a leading role when it comes to voluntary sustainability disclosures (Dumay *et al.*, 2019; Traxler and Greiling, 2018).



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For improving, managing and standardizing SR, a plethora of globally, regional and national guidelines have been developed by standard setters of which the Global Reporting Initiative (GRI)-Guidelines are the most adopted by organizations worldwide (KPMG, 2017). More than 93% of the top 250 largest companies worldwide published a SR in 2016–2017, whereby 74% were using the GRI-G4-Guidelines (KPMG, 2017). The Guidelines provide besides a sector-neutral standard and specific disclosure guidelines also sector-specific supplements (GRI, 2015) allowing for a global perspective and comparison of reporting practices of most important industries worldwide (Lock and Seele, 2016).

This paper aims to gain insights on the sustainability reporting practice of Electric Utility Companies (EUC) and their coverage of indicators based on the GRI-Guidelines and its sector-specific supplement. EUC with its mixed ownership present an industry which is especially confronted with sustainability issues and debates. For years the energy sector has undergone fundamental changes of market-liberalization increasing the hybridity in the sector, changing market conditions and deregulations, turning away from monopolistic companies (Erbach, 2016; Kerckhoffs and Wilde-Ramsing, 2010). EUC are perceived to be significant polluters contributing to climate change and environmental strain, showing social and ecological negative effects (CDP, 2017; GRI, 2015; Alrazi, 2014; Burgherr and Hirschberg, 2014; González González, 2010; Kerckhoffs and Wilde-Ramsing, 2010; Fischhoff, 2007). Critical stakeholders demand that EUC solve that problem (Ng and Nathwani, 2012) and focus on reducing negative environmental performance (Bahari *et al.*, 2016; Moseñe *et al.*, 2013). Hence, EUC are pressured to act sustainable but face a dilemma (González González, 2010). They are challenged to reduce environmental contamination by adapting to renewable energy and carbon-neutral technologies (Erbach, 2016; Moseñe *et al.*, 2013; Bakhtina and Goudriaan, 2011) while simultaneously securing electricity supply (González González, 2010). The 2015 Paris Agreement and the UN Sustainability Development Goals commit national governments to combat climate change having direct effects on regulations and stakeholder expectations for the electricity sector (Traxler and Greiling, 2018). The sectors powerful economic and political influence and often the global operations of EUC are critically observed by stakeholders (Ng and Nathwani, 2012). Therefore, EUC are in need of extensive sustainability concepts, especially, since the sector has immense potential for contributing to TBL-developments while simultaneously being connected with negative social and environmental impacts (Kerckhoffs/Wilde-Ramsing, 2010). Stakeholders demand a TBL-accountability providing financial and non-financial information (Moseñe *et al.*, 2013).

The credibility and reliability of SR have however been continuously criticized in literature for being a green-washing attempt, a legitimacy façade, for being non-transparent and limited in scope, implying impression management and marketing as disguise for enhancing a company's image (Lock and Seele, 2016; Cho *et al.*, 2015). The negative image of EUC regarding sustainability engagement also increases skepticism among stakeholders (Miras-Rodríguez *et al.*, 2015). Therefore, companies in environmental sensitive industries, like EUC, are especially trying to increase their public reputation by disclosing voluntary non-financial reports (Fernandez-Feijoo *et al.*, 2014; Moseñe *et al.*, 2013). Talbot and Boiral (2018) criticize that impression management and marketing is often the disguise of SR for enhancing a company's image. A lack of complete, balanced, comparable, accurate, timely, clear and reliable SR decreases their credibility and relevance for stakeholders (Lock and Seele, 2016; Cho *et al.*, 2015).

In perspective of that criticism, it is questionable whether SR by EUC cover the information needs of multiple stakeholders regarding TBL-accountability providing relevance for this study. This paper analyses the coverage of SR by EUC worldwide based on TBL-sustainability and the GRI-G4-Guidelines. Additionally, the paper analyzes dependency factors like *ownership*, *stock-exchange listing*, *area of activity (national or international)* and *region* and its influence on the coverage of SR. This gives opportunity to better understand the sustainability reporting practice of EUC and its influences. It provides

practical reporting insights for EUC, standard-setters like the GRI and regulators and contributes to sustainability reporting research. Based on the research objective, the following research questions (RQs) are addressed:

RQ1. How is the coverage of indicators in SR by EUC based on the GRI-G4-Guidelines and the three dimensions of sustainability?

RQ2. Which factors influence the coverage of SR by EUC?

Thereafter, chapter two describes the theoretical approach. Chapter three illustrates the descriptive sample and methodology. Results of the study are presented in chapter four followed by the critical discussion, practical implications, limitations and future research in chapters five and six.

2. Prior empirical studies and theoretical approach

2.1 Prior studies on sustainability reporting by EUC

Prior literature between 2000 and 2018 showed that sustainability reporting of EUC has only been covered by research to a small and not generalizable extent. About 18 out of 22 articles found have been published since 2010 showing relevance of the topic. While 13 studies focus on environmental reporting, the three dimensions of sustainability are neglected. Ten articles focus on SR using the GRI-framework. Three studies focus on all three dimensions of sustainability and only four studies cover global SR (see Table 1).

Besides research on content and quality of SR, literature also investigated on dependency factors of sustainability reporting like ownership (Cormier and Gordon, 2001; Van der Laan Smith *et al.*, 2005; Meyer and Pac, 2013; Bae, 2014), size (Cormier and Gordon, 2001; Alrazi *et al.*, 2010, 2016), market situation and competition (Kraft, 2018), country/region and stakeholder pressure (Van der Laan Smith *et al.*, 2005; Alrazi *et al.*, 2010, 2016) as well as institutional contingencies (Moseñe *et al.*, 2013) and whether or not these factors are influencing the coverage and quality of sustainability reporting. Additionally, Alrazi *et al.* (2016) identified that age, stock exchange listing and exposure to media are also influential factors for sustainability reporting. However, the authors are concentrating merely on environmental disclosure.

In sum it is noticed that SR by EUC are covering foremost environmental aspects while the social dimension is underrepresented. Only few studies analyze the coverage and the content of SR based on the TBL (see Gallego, 2006; Roca and Searcy, 2012; Sartori *et al.*, 2017; Traxler and Greiling, 2018). While most studies take reference to the GRI-framework, research shows some limitations, namely, mostly small samples and the concentration on particular countries. Studies do not offer generalizable results. Furthermore, the literature review shows that only one study by Traxler and Greiling (2018) provides a larger sample of empirical research of EUC worldwide. However, since the GRI-G4 Guidelines are the currently most used, the study still presents a weak sample as the authors acknowledge.

2.2 Neo-institutionalism (NI)

NI can explain phenomena for this study since sustainability reporting is a reaction to institutional expectations which provoke companies to publish SR (Chen and Bouvain, 2009). While EUC were long institutionalized in the public sector, for the last decades they have undergone a transformation due to market liberalization. NI observes the reciprocal relationship between EUC and society/environment and the dynamic of a continuous building and reorganizing for adaptation of organizational structures. It is possible to analyze sustainability reporting insight of an organizational field like the energy sector and its sector-wide conformity to institutional expectations (Meyer and Rowan, 1977; DiMaggio and Powell, 1991; Boxenbaum and Jonsson, 2008; Chen and Roberts, 2010). If EUC comply with their organizational activities to established societal expectations (like norms, regulations, beliefs)

Table 1.
Summary of the
literature review

Cluster	Theories	Authors
Focus on environmental reporting since environmental pollution of EUC makes information exchange with multiple stakeholders a central importance. However, the three dimensions of sustainability are neglected	Stewardship theory, legitimacy theory, voluntary disclosure theory and signaling theory, impression management	Freedman and Stagliano (2008); Alrazi <i>et al.</i> (2010); 2016; Silva-Gao (2012); Chang (2013); Meyer and Pac (2013); Moseñe <i>et al.</i> (2013); Alrazi (2014); Camargos <i>et al.</i> (2014); Bae (2014); Bahari <i>et al.</i> (2016); Kraft (2018); Talbot and Boiral (2018)
Focus on sustainability reports. Ten out of 19 articles use the GRI-framework	Legitimacy theory, (strategic) stakeholder theory, contingency theory, neo-institutional theory, signaling theory, agency theory	Gallego (2006); Alrazi <i>et al.</i> (2010); 2016; Bakhtina and Goudriaan (2011); Roca and Searcy (2012); Moseñe <i>et al.</i> (2013); Alrazi (2014); Bahari <i>et al.</i> (2016); Garcia <i>et al.</i> (2016); Sartori <i>et al.</i> (2017); Kraft (2018); Traxler and Greiling (2018)
Focus on all three dimensions of sustainability	Agency theory, strategic stakeholder theory, legitimacy theory	Gallego (2006); Ng and Nathwani (2012); Traxler and Greiling (2018)
Focus on single countries, especially the US and European countries	Legitimacy theory, stakeholder theory, contingency theory, neo-institutional theory	Cormier and Gordon (2001); Van der Laan Smith <i>et al.</i> (2005); Gallego (2006); Freedman and Stagliano (2008); Roca and Searcy (2012); Silva-Gao (2012); Meyer and Pac (2013); Moseñe <i>et al.</i> (2013); Bae (2014)
Five studies cover global sustainability reports, however, the sample size is small, except the study by Traxler and Greiling (2018)	Legitimacy theory, (strategic) stakeholder theory, signaling theory, agency theory, impression management	Alrazi <i>et al.</i> (2010); 2016; Kraft (2018); Talbot and Boiral (2018); Traxler and Greiling (2018)

EUC are able to secure access to resources, gain social support, maximize their legitimacy, reduce insecurities in the dynamic environment and secure organizational survival (DiMaggio and Powell, 1991; Chen and Roberts, 2010; Higgins and Larrinaga, 2014). In that regard, the theory targets the different institutional forces and processes established as coercive, normative and mimetic isomorphism (DiMaggio and Powell, 1991). NI also offers a theoretical base for identifying institutional drivers for sustainability reporting within a sector. Previous research recognized that isomorphic forces have thus the potential to influence the extent, quality and variety of disclosed information in SR (Moseñe *et al.*, 2013; González González, 2010).

Coercive isomorphism is based on power relationships like political forces with sanctioning powers exerting formal or informal pressure (e.g. international, national or regional regulations demanding the adaption of ecological and societal responsibilities within a sector). The pressure can be felt as force (e.g. through the power of the European Commission, regulators, investors) (Chen and Roberts, 2010) or as firm inner conviction of a company. Cross-national guidelines and regulations like the EU-Directive or the Paris Agreement may however overarch institutional contingencies in the different countries (as seen in Europe; Moseñe *et al.*, 2013) Also, stakeholder expectations toward adaptation of renewable energy, securing access to electricity and transparent information place pressure onto EUC (Moseñe *et al.*, 2013; KPMG, 2017), whereby coercive isomorphism is developed

(Boxenbaum and Jonsson, 2008). EUC are trying to avoid sanctioning and gain legitimacy by conforming to these expectations and regulations.

In comparison, *normative isomorphism* develops growing professionalism (DiMaggio and Powell, 1991) and standardization in industries (Bradford *et al.*, 2016) through knowledge acquisition from education facilities or universities or through professional networks like the UN Global Compact (González González, 2010) which interact with companies teaching norms and regulations regarding organizational activities. The professionalized GRI-framework, the UN Sustainability Development Goals and other guidelines are setting norms for reporting practice (KPMG, 2017). The GRI sector-specific supplements are also a contribution to the successful sector-wide institutionalization of standards (Brown *et al.*, 2009). The EU-Directive already enforces the GRI-framework as standard. This puts normative pressure onto EUC which leads to homogenization within the sector. Normative isomorphism fosters a “how to” and “we have to disclose” attitude toward sustainability reporting and can be a stewardship attempt toward compliance with an occurring norm. In that case, compliance is a result of conventional business practices in accordance with established norms (Boxenbaum and Jonsson, 2008).

Mimetic isomorphism is a strategy to cope with those insecurities, like new regulations, extensive liberalization as well as the growing competition in the electricity sector, by imitating organizational structures and processes of other successful and legitimized EUC. For example, some studies identified the reporting practice of Spanish EUC as mimetic force for the rest of European countries (Moseñe *et al.*, 2013; González González, 2010). While Contrafatto (2014) claims that mimetic isomorphism can bring sector-wide standardization regarding sustainability reporting, others tend to recognize a diffusion of isomorphic mechanisms (Shabana *et al.*, 2017).

NI demonstrates that EUC homogenize because of isomorphic forces (Moseñe *et al.*, 2013). A crucial factor for organizational survival is successful compliance to environmental and social pressures. However, complying with isomorphic pressures while acting upon efficiency targets is a phenomenon called *decoupling* from formal structures (Meyer and Rowan, 1977). By decoupling, companies can create stable situations staying within legitimized structures as symbolic conformity while actual activities may differ from such structures (Meyer and Rowan, 1977). While this strategy is described as defensive mechanism, recent studies see decoupling as part of an impression management (Boxenbaum and Jonsson, 2008). In that regard, it becomes questionable whether sustainability reporting is more than just a superficial conformity (Shabana *et al.*, 2017; Cho *et al.*, 2015).

In light of NI, isomorphic pressures have an impact on sustainability reporting. Coercive isomorphism may influence sustainability reporting of *public* and *stock-exchange listed* EUC due to regulations and societal expectations and the need for organizational and public legitimacy (Alrazi *et al.*, 2016; Moseñe *et al.*, 2013). Especially public EUC have a higher accountability obligation to their stakeholders. However, conflicting results in literature suggest that private and listed EUC disclose more indicators in SR by EUC (Traxler and Greiling, 2018; Meyer and Pac, 2013; Bae, 2014). Hence, the following hypotheses were established:

H1. Ownership influences the coverage in SR by EUC.

H2. Stock-exchange listing influences the coverage in SR by EUC.

Normative isomorphism may influence sustainability reporting of *international public* and *listed* EUC due to available voluntary standards, guidelines, memberships (e.g. UN Global Compact) suggesting appropriate reporting practices (González González, 2010). Hence, the *area of activity* may also influence SR by EUC to sustain international reputation.

H3. Area of activity influences the coverage in SR by EUC.

Mimetic isomorphism may also influence sustainability reporting of EUC from economically weaker countries (*regions*) to gain international business legitimacy (Alrazi *et al.*, 2016; Moseñe *et al.*, 2013). *International Public*, *Private* and *listed* EUC are trying to adopt good reporting practices from other more legitimate EUC in order to meet international standards and stakeholder expectations.

H4. Region influences the coverage in SR by EUC.

2.3 Strategic stakeholder theory

Strategic stakeholder theory focuses on the relationship between an organization and the variety of strategic relevant stakeholder groups. By taking stakeholder needs and their demands into account, companies ideally meet stakeholders' expectations securing the availability of resources while creating value for stakeholders (Loh *et al.*, 2015; Hörisch *et al.*, 2014; Harrison, 2013; Freeman, 2010). The study by Van der Laan Smith *et al.* (2005) shows that EUC encounter a great variety of stakeholders like shareholders, customers, regulators, environmental activists, employees, politicians and society with partly conflicting expectations. EUC are faced with the challenge to balance divergent interests, information needs and transparency demands of multiple stakeholders (Garcia *et al.*, 2016; Bahari *et al.*, 2016; Bonsón and Bednárová, 2015; Chen and Roberts, 2010; Freeman, 2010). While the interests of the various stakeholders should be considered alike (Roca and Searcy, 2012) practice shows that stakeholders of EUC are not given equal relevance. Deegan (2000) categorizes stakeholder theory into an ethical and managerial branch which can be compared to Wilmhurst's (2004) normative and managerial perspectives. The ethical branch or normative perspective is to focus on all stakeholders equally. Managers, however, ascribe more relevance to expectations of strategically more interesting stakeholder groups if they consider them to be powerful, foster ways of legitimacy or present certain urgencies and dependencies (Islam and Deegan, 2008; Van der Laan Smith, *et al.*, 2005; Deegan, 2000; Frooman, 1999; Mitchell *et al.*, 1997) thus leading to different organizational strategies of interaction (Herremans *et al.*, 2016). The more dependent organizations are on stakeholders the more likely will managers disclose information necessary for those relevant stakeholders (Frooman, 1999). With the focus on sustainability reporting, this study thus addresses stakeholder theory in light of a managerial perspective.

As a strategic communication tool to relevant stakeholders, EUC are publishing SR trying to match stakeholder expectations and information needs (Loh *et al.*, 2015; Van der Laan Smith *et al.*, 2005; Wilmhurst, 2004) by addressing TBL-accountability issues (Kaur and Lodhia, 2018). Hence, strategic stakeholder theory is an important theory to better understand sustainability reporting practices (Roca and Searcy, 2012; Guthrie *et al.*, 2004). It also helps to explain that sustainability reporting may be influenced by the focus on relevant or selective stakeholders, thus disclosing only selective information.

H5. The selection of relevant stakeholders influences SR by EUC.

3. Sample description and methodology

3.1 Analysis of the coverage of SR

This research focuses on identifying the quantitative coverage of indicators in SR by EUC by analyzing SR content based on the GRI-G4-framework (RQ1). G4-Guidelines are the latest version of GRI-Guidelines after G3.1 and before the GRI-Standard was developed. The G4-Guidelines currently offer the most uploaded reports. For this research, 489 energy companies were retrieved from the GRI database (deadline: 31.12.2017). 186 latest GRI-G4 SR by EUC worldwide were included for further analysis. The other 303 hits were either reports

in the oil or gas sector or had no G4-reporting or were only available in other languages than English or German and were thus excluded from our sample. Due to the foremost voluntary nature of sustainability reporting, the 186 latest SR included reports from 2013 up to 2017, most of which were from SR published in 2016. This sample presents thus the most current status of the reporting practice of the electricity sector. Compared with the previous study by [Traxler and Greiling \(2018\)](#), this study simultaneously shows the learning-curve of discloser practice. However, a comparability problem of, e.g., national, regional or cultural influences did not exist since this study investigated quantitatively measured indicators based on the GRI-content-index and not the qualitative information of disclosed data. EUC are able to report on all GRI provided indicators no matter the national or regional situation.

Indicators and its coverage in SR by EUC were then analyzed twofold: firstly, with a quantitative content analysis of G4-indicators of 186 SR identifying the (total) coverage rates ((T)CR) of reported indicators; secondly, with a multiple (backward) regression analysis for identifying differences between dependency-factors and TCR ([RQ2](#)). The coverage of indicators was analyzed by taking the GRI-content-index in each SR, which provides a list of information and indicators to be covered making SR comparable and allows for deriving a deductive category-system to systematically analyze and evaluate information to be covered in SR. This study analyzed all disclosed general standard and specific and sector-specific G4-indicators of EUC including all performance indicators (PI), material aspects and disclosures on management approach (DMA) that “*provides narrative information on how an organization identifies, analyzes, and responds to its actual and potential material economic, environmental and social impacts*” ([GRI, 2015](#), pp. 45).

The category-system finally covers seven subcategories: (1) 63 general standard disclosures; (2) 21 economic; (3) 47 ecological; and 91 social indicators, namely: (4) 27 to labor practice and decent work; (5) 22 to human rights; (6) 20 to society and (7) 22 to product responsibility. Altogether, the category-system consists of 222 indicators for EUC listed in each content-index with reference to pages in SR and is base for the analysis (random checks were performed whether indicators are also covered in SR-texts). To assess the CR of indicators, a binary coding-scale was used: 1 – when EUC disclosed an indicator and 0 – when they did not. A partial disclosure of indicators as well as declared reasoning for non-disclosure was also treated as disclosed (see [GRI, 2015](#)). Therefore, it is also possible for EUC with restricted fields of activities to reach an extensive CR. Not explaining the non-disclosure of indicators including its DMA was however treated as non-disclosed for lack of transparent communication. The TCR for all seven subcategories were then analyzed in SPSS. The calculations were done by dividing the number of disclosed indicators by the number of total indicators of each subcategory (i.e. the economic dimension consists of 21 indicators, of which company A discloses ten indicators – resulting in a CR of the economic subcategory of 47.6% (10/21)). Furthermore, the TCR was calculated taking the number of indicators as base giving all indicators the same relevance.

$$\text{TCR} = \frac{\sum \text{Amount of disclosed indicators}}{222}$$

3.2 Analysis of dependency factors

Based on the TCR as dependency variable, possible determinants influencing SR like *ownership*, *stock-exchange listing*, *area of activity* and *region* were analyzed ([RQ2](#)). Each factor was tested in SPSS for influencing the TCR. For each factor a H_0 -hypothesis (no correlation) and a H_1 -hypothesis (positive correlation) with $\alpha = 0.05$ were assigned. H_0 was rejected if the p -value was below $\alpha = 0.05$. Hypotheses are established for *ownership*, *stock-exchange listing*, *nationality* and *region* (see hypotheses development in [Section II](#)) each coded with 0 or

1 (Mann–Whitney-*U*-test) and 1–8 for regions (Kruskal–Wallis-*H*-Test). *Ownership* defined whether EUC were more in private (0) or in public (1) hands (>50% of shares). *Stock-exchange listing* shows whether EUC are listed (1) or not (0). *Area of activity* shows whether EUC are only national (0) or international active (1). The *region* is separated into eight areas since regional culture, economies or laws may influence SR: Africa (1), Asia (2), Central America including the Caribbean (3), European Union and Eastern Europe (4), Middle East (5), North America (6), Oceania (7), South America (8).

Additionally, the multiple (backward) regression analysis shows the interrelation of factors in regard to the TCR. It also serves as an instrument of reliability regarding the results of the other two tests.

4. Results

4.1 Descriptive results

This empirical study analyzed 186 GRI-G4 SR by EUC from 2013 to 2017, most of which were published in the year 2016. Results show that a bit less than 78% of all SR cover sector-specific indicators for electric utilities which are on average only covered to 42.6%. While EUC of 45 countries publish G4-SR, most SR are published in the USA, Brazil, Germany, Spain and Russia accounting for 38.7% of the entire sample. 60% of all SR are from public EUC. 59.6% are internationally active while 68.8% are stock-exchange listed EUC. Furthermore, results show 46.7% of SR are published in Europe presenting the largest sample while Central America, Africa and Oceania show the least published SR (see Figure 1).

4.2 Results of the coverage of SR

Regarding RQ1, the following CR along all seven subcategories and the three dimensions of sustainability were found: While *general standard disclosures* are covered to 74.6%, all other categories except *labor practice and decent work* cover less the 50% of indicators. The least amount of information is provided in the subcategories *human rights* and *product responsibility*. Figure 2 shows the six TBL-subcategories. Appendix 1 provides further explanations of highest and lowest CR.

Figure 3 presents a final summary of results. A comparison of CR shows that information on DMAs are much less reported than its related PI. Results also show that the coverage of European SR almost matches the coverage of SR worldwide despite the dominant reporting role of Europe. Moreover, the TCR of SR by EUC worldwide is illustrated. It shows that 50.5%

Figure 1.
Amount of SR based on
dependency factors

Country	Amount	Country	Amount	Country	Amount	Ownership	Amount	Area of Activity	Amount
USA	16	Japan	5	Ireland	1	Private	74	National	75
Brazil	14	Poland	4	Lithuania	1	Public	112	International	111
Germany	12	Netherlands	4	Hungary	1	Σ	186	Σ	186
Spain	11	Columbia	4	Slowenia	1				
Russia	11	Norway	3	Sweden	1				
Italy	8	Turkey	3	Chile	1				
Canada	7	Greece	3	Peru	1				
Australia	7	Philippines	3	Saudi Arabia	1				
South Korea	7	Indonesia	3	Vietnam	1				
Switzerland	6	Portugal	2	Macao	1				
Austria	6	Belgium	2	UAE	1				
Finland	6	New Zealand	2	South Africa	1				
India	6	Nigeria	2	Oman	1				
China	6	Qatar	2	Mauritius	1				
Thailand	5	Czech Republic	1	Singapore	1				
Σ					186				

Region	Amount	Listing	Amount
Africa	3	Listed	128
Asia	32	Not listed	58
Central America	0	Σ	186
Europe	87		
Middle East	12		
North America	23		
Oceania	9		
South America	20		
Σ	186		

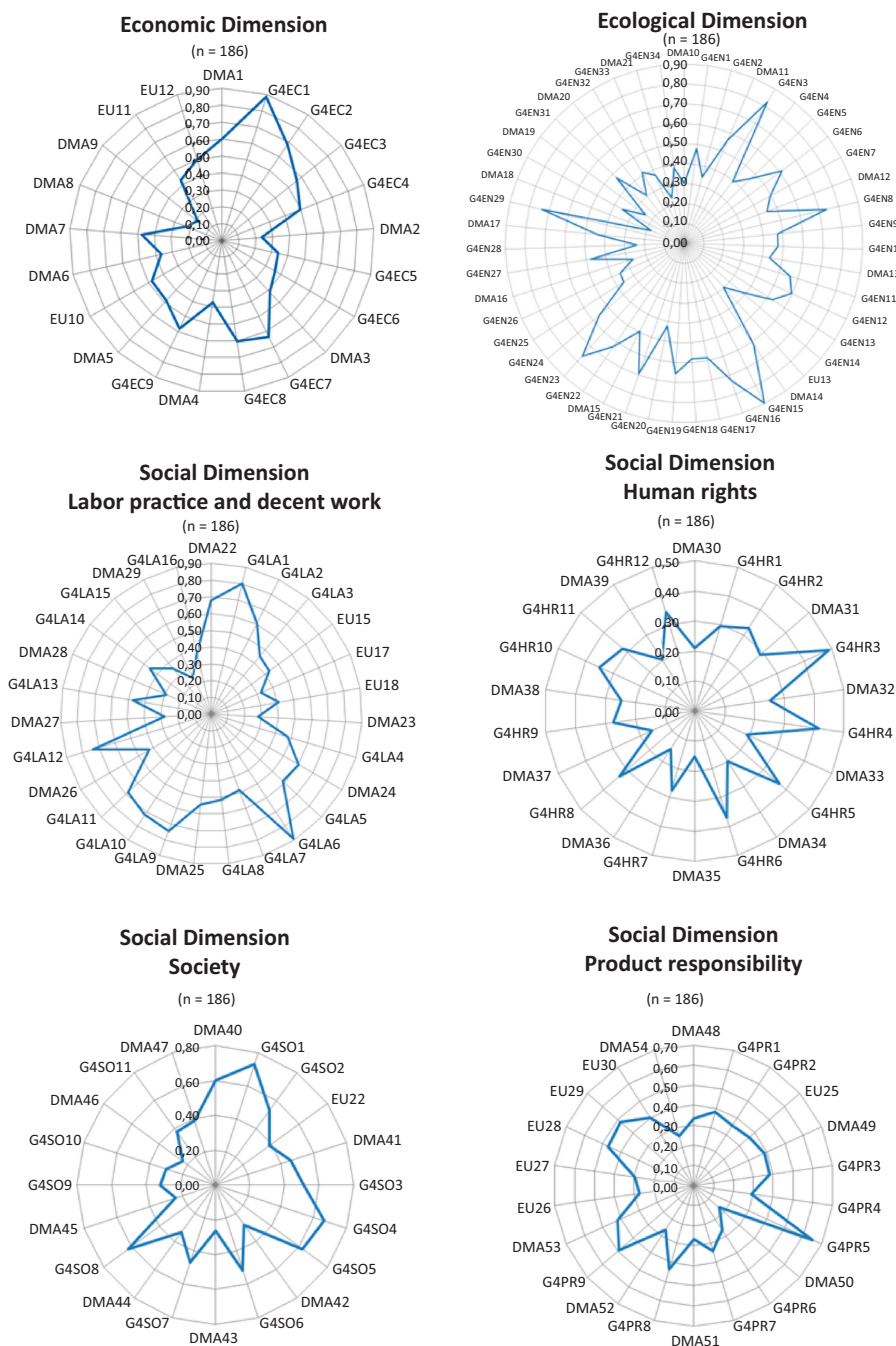


Figure 2.
CR of the TBL-
dimension

(94/186) of all GRI-G4 SR report less than 50% of indicators. Some of the EUC barely cover 15% of all indicators. However, 30 of 186 EUC cover more than 75% in SR. None of the three dimensions of sustainability are covered beyond 48.7%. The ecological dimension shows the highest coverage, followed by the economic and the social dimension.

4.3 Results of dependency factors

Table 2 displays how dependency factors like *ownership*, *stock-exchange listing*, *area of activity* and *region* influence the coverage of SR by EUC (RQ2).

In relation to *ownership*, results show that 74 EUC are privately owned disclosing 56.5% of indicators on average, while 112 public EUC cover only 49.8% with a significance of $p = 0.022$. The TCR of *stock-exchange listed* EUC (54.9%) is almost 8% points higher than the TCR of not-listed EUC (47.2%) with a significance of $p = 0.021$. 69 EUC are public and stock listed while only 59 EUC are private and stock listed. The higher TCR of private and stock listed EUC shows significant results ($p = 0.017$) as does the lower TCR of public and not-listed EUC ($p = 0.011$). The regression analysis verifies these results ($p = 0.015$) showing reliability. *Area of activity* shows no significance. Non-significant results were also found when evaluating the *region* ($p = 0.787$).

However, the backward-regression analysis shows that particularly *private* and *listed* Asian EUC show significantly better coverage in SR than any other region ($p = 0.037$). This also shows that *public* and *not-listed* Asian EUC cover SR-content significantly lower (see Table 2).

5. Discussion and conclusions

Concerning RQ1, the results show that sustainability reporting and the disclosure on sustainability performance is only slowly becoming an institutionalized business practice in EUC. While general standard disclosures regarding *company profile* are on average well

Subcategories	CR Global	CR DMA	CR PI
General Standard Disclosures	74.6%	--	--
Economic Disclosures	47.0%	37.3%	54.6%
Ecologic Disclosures	48.7%	37.7%	52.4%
Labor Practice and Decent Work	50.9%	41.7%	55.3%
Human Rights	28.2%	20.4%	34.7%
Society	44.2%	35.0%	50.4%
Product Responsibility	36.3%	30.0%	39.2%

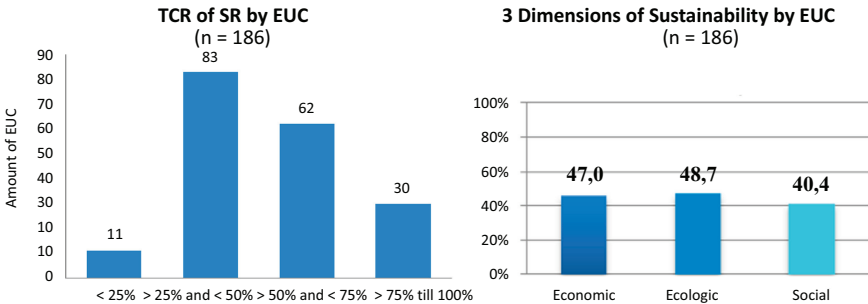


Figure 3.
CR and TCR of SR by
EUC and the three
dimensions of
sustainability

Influential factors	Amount of EUC (<i>n</i> = 186)	TCR	<i>p</i> -value ≤ 0.05	Influential factors	<i>p</i> -value ≤ 0.05	Influential factors	Amount of EUC (<i>n</i> = 186)	TCR	<i>p</i> -value ≤ 0.05
<i>Ownership</i>						<i>Region</i>			
Private	74	56.6%	Mann–Whitney <i>U</i> -Test $\alpha = 0.022$	Private and Listed	Mann–Whitney <i>U</i> -Test $\alpha = 0.017$	Africa	3	44.6%	Kruskal–Wallis <i>H</i> -Test $p = 0.787$
Public	112	49.8%				Asia	32	51.8%	
<i>Stock exchange listing</i>						Central Amer	0	0%	
Listed	128	54.9%	Mann–Whitney <i>U</i> -Test $\alpha = 0.021$	Private and not-listed	Mann–Whitney <i>U</i> -Test $\alpha = 0.011$	Europe	87	52.4%	
Not-listed	58	47.2%				Middle East	12	57.1%	
<i>Nationality(area of activity)</i>						North America	23	54.4%	
National	75	51.9%	Mann–Whitney <i>U</i> -Test $\alpha = 0.778$			Oceania	9	43.3%	
International	111	52.8%				South America	20	53.6%	

(continued)

Table 2.
Influence of
dependency factors
of SR

Table 2.

ANOVA ^a						
Model	Influencing variable	Square sum	df	Mean of square	F	Sig.
1	TRC (dependency Variable) Public, Listing, Nationality, Asia, Europe, North America, Middle East and South America	Regression Not standardized residue Sum 0.476 7,707	8 177	0.059 0.044	1,366	0.214
2	(dependency Variable) Public, Listing, Asia, Europe, North America, Middle East and South America	Regression Not standardized residue Sum 0.476 7,707	7 178	0.068 0.043	1,570	0.147
3	(dependency Variable) Public, Listing, Asia, Europe, North America and South America	Regression Not standardized residue Sum 0.459 7,724	6 179	0.077 0.043	1,773	0.107
4	(dependency Variable) Public, Listing, Asia, Europe and North America	Regression Not standardized residue Sum 0.409 7,774	5 180	0.082 0.043	1,895	0.097
5	(dependency Variable) Public, Listing, Asia and Europe	Regression Not standardized residue Sum 0.391 7,792	4 181	0.098 0.043	2,272	0.063
6	(dependency Variable) Public, Listing and Asia	Regression Not standardized residue Sum 0.373 7,810	3 182	0.124 0.043	2,895	0,037
7	(dependency Variable) Public and Listing	Regression Not standardized residue Sum 0.365 7,818	2 183	0.183 0.043	4,273	0,015
Note(s): The significance value: $p\text{-value} \leq 0.05$		8,183	185			

covered, ecological, social and even economic TCR are imbalanced showing room for improvement. In particular, the social dimension is still underrepresented in SR by EUC. With 42.6%, the average CR of sector-specific indicators is even weaker, which raises the question how well EUC meet reporting expectations of regulators, standard-setters and other critical stakeholders. The extend on which EUC report on TBL-issues is influenced by two dependency factors, namely *ownership* and *stock-exchange listing*, especially in Asian EUC (RQ2). Non-significant results of the *area of activity* and all other *regions* are probably due to cross-national regulations, like the EU-Directive or the Paris Agreement suggesting a cross-national homogenization of SR. Results can be further interpreted in light of the theoretical lenses:

5.1 Neo-institutionalism

EUC are subjected to institutional forces like regulations, societal pressure and stakeholder demands as part of a *coercive isomorphism*. In exchange for critical resources, medium and highly salient stakeholder put pressure onto EUC demanding extensive accountability and transparency (Kaur and Lodhia, 2018) driving especially *private* and *stock-exchange listed* EUC toward higher coverage in SR. *Listed* EUC disclose more information than *not-listed* EUC. *Public* EUC lag behind regarding the quantitative TCR despite the much earlier confrontation with critical stakeholders and the much more complex public accountability obligations than their *private* sector counterparts (see Bae, 2014). *Public* EUC seem to feel complacent lacking of political control mechanisms.

Considering that GRI is a voluntary standard and therefore unlike the energy sector regulation a “privatization of governance” (Gibassier, 2015), the higher guideline compliance of *private* and *listed* EUC can be interpreted that they are more inclined toward private governance modes. Such behavior can be seen in line with *normative isomorphism* or a higher degree of adoption of voluntary professional practices to oblige to the institutionalized norm of TBL-reporting.

Looking at the coverage of indicators, only some indicators are fairly consistent covered, while others vary considerably. The cross-national concentration on the disclosure of similar TBL-indicators in SR by EUC like *economic performance*, *emission*, *energy* and *employment* is a result of *mimetic isomorphism* (see also Moseñe et al., 2013) and what can be regarded as a tendency of selected homogenization. EUC are trying to gain national and international image and sympathy providing transparent SR by imitating reporting practices from other legitimized EUC (Bonsón and Bednárová, 2015; Fernandez-Feijoo et al., 2014; Moseñe et al., 2013).

However, traditional NI authors would interpret the idea of a selective homogenization as a sign of *decoupling* or impression management (Boxenbaum and Jonsson, 2008) for enhancing a company’s reputation, being nothing more than superficial conformity to stakeholder demands (Shabana et al., 2017; Cho et al., 2015). It allows, however, for assuming that despite coercive, mimetic and normative forces, a sector-wide homogenization is so far limited.

In light of NI, the observed higher total compliance rate of *private* and *listed* EUC is not only in line with prior findings across sectors but can also be interpreted as a higher adaptability toward isomorphic pressures. Private governance modes like the GRI may face lesser acceptance resistance in *private* and *listed* EUC which are well aware of the advantages of reputational signaling.

A more positive interpretation of the mediocre TCR could be that EUC might concentrate their reporting on stakeholder-material aspects. The G4-Guidelines recommend concentrating SR on aspects which stakeholders regard as highly relevant. To clarify this, the reported indicators need to be matched with the materially matrices of EUC. In the case of *public* EUC, the low compliance rates could also be due to the dense net of mandatory public accountability

obligations (e.g. in form of democratic or political accountability or special scrutiny by the court of audits). The reporting fatigue (Gibassier, 2015) may be higher in *public* EUC as they are more densely regulated.

5.2 Strategic stakeholder theory

EUC encounter a variety of stakeholders with different information needs and a potential for conflicting interests (Moseñe *et al.*, 2013). As a managerial reaction to the institutionalized stakeholder-power of relevant (critical) stakeholders (Deegan, 2000), one rational strategy to meet extensive accountability and transparency demands can be to report as many indicators as possible thereby increasing reputation and stakeholder value (Hörisch *et al.*, 2014). The mediocre TCR of EUC shows, however, that EUC do not pursue this approach and refrain of potentially overloading stakeholders with too many indicators. The purpose and publication of SR as tool for communicating to stakeholders is not used appropriately, so far, and does not seem to be particularly stakeholder-oriented. *Public* EUC miss especially the opportunity of stakeholder value and image creation by complying with stakeholder information needs through transparent, credible and reliable reporting. It appears that *public* EUC are less dependent on relevant stakeholders.

The mediocre TCR show that no particular stakeholder group of EUC appears relevant except for employees – who surely create dependencies. *Employment* as part of the social dimension is covered slightly higher than the economical or the ecological dimension and indicates the relevance of employees. However, DMAs for those indicators remain under-disclosed. It may be hard for employees (and other interested stakeholders) to trust SR and attribute value to EUC if apparently relevant aspects and its DMAs are not covered satisfactorily. The stakeholder-power of employees seems to evoke a *decoupling* toward impression management. In general, it appears that stakeholders may not be as salient as they are expected to be.

Furthermore, the higher TCR of *private* and *listed* EUC allows for assuming that they are more stakeholder-oriented than *public* and *not-listed* EUC. This is contradictory to the expectations that public utilities as stewards of society at large are intrinsically stakeholder-oriented. However, especially *public* and *not-listed* Asian EUC seem to deemphasize with their stakeholders. While *private* and *listed* Asian EUC better comply with regulations and stakeholder information needs. Thus, it can be assumed that the continuous privatization of the sector is globally beneficial to stakeholders and their attribution of organizational and public value.

The overall purpose of EUC publishing SR does not seem clear to relevant stakeholders. Therefore, the intention and message may be misunderstood by stakeholders who may have difficulty trusting disclosed information (Dumay *et al.*, 2019), especially by *public* and *not-listed* EUC. Whether or not disclosed sustainability information is part of an open and honest disclosure or an act of impression management or a green-washing attempt makes a difference (Bartels *et al.*, 2016).

In light of strategic stakeholder theory, the lack of stakeholder compliance in SR by EUC may increase devaluation (being understood as *decoupling*) from an expected reporting practice. Under stakeholder accountability aspects, *private* and *listed* but especially *public* and *not-listed* EUC still have room to improve the use of SR as a communication tool for demonstrating their extent of stakeholder value creation through transparent, credible and reliable reporting.

5.3 Practical implications and contributions

Consequently, *governments and regulators* should increase and heighten their coercive pressure in those areas which they regard as essential for monitoring the sustainability

performance of the EUC. This would eventually lead to homogenization in the sector and a better reporting practice of EUC. Currently the frequently reported indicators are not sector-specific enough.

Standard-setters like the GRI should continue to urge EUC to focus on materiality identifying stakeholder-material aspects in SR. The GRI-G4 sector supplement is obviously not regarded as useful tool for improving stakeholder accountability as the average TCR of the sector-specific indicators is even lower than the coverage of sector neutral indicators. Identified results could be a starting point for optimizing the GRI-framework toward improved stakeholder accountability in the electricity sector. The disclosure should be fine-tuned toward stakeholder-relevant aspects.

Furthermore, *EUC* are asked to adapt a more pro-active stewardship attitude toward sustainability performance and transparent reporting, acting as stewards to its environment and society. This may produce more credible and reliable reports and will help gaining back trust of critical stakeholders. Based on this study, however, trusting that isomorphism will improve and homogenize the reporting practices of EUC is a misleading assumption. EUC can improve their reporting practices by focusing on quality disclosure of materiality and assuring a complete coverage of those identified material aspects. However, sustainability performance is not a matter of disclosing indicators but rather a matter of adapting performance to continuously improve on all material TBL-aspects.

This study contributes to the, so far, under-researched field of sustainability reporting practices of EUC which are in an important sector under climate change and infrastructure aspects. This study presents findings of a global comparison of SR by EUC along the TBL-dimensions offering a more holistic picture of the sustainability reporting practice of EUC. In addition, the theoretical background allowed for identifying a selective homogenization of disclosed indicators in SR by EUC and a lack of stakeholder compliance.

5.4 Limitations and future research

This study has limitations since only the quantitative CR of GRI-G4 reports by EUC were analyzed. The quality of disclosed information and the actual sustainability performance of EUC was not investigated which offers avenues for further research. Future research could also focus on other reporting frameworks, scrutinizing stakeholder engagement and compliance to their information needs. Furthermore, it is still open to what extent EUC should disclose relevant aspects, i.e. climate change indicators. Whether a change towards a stewardship perspective would improve the reporting practices or whether the reporting fatigue of public utilities is caused by an accountability overload elsewhere is also something to be further explored.

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Appendix

Dimensions	Performance indicators (PI) and disclosure on management Approach(DMA)	
Economic	Highest coverage: Above 75%	Lowest coverage: Above 25%
<i>Ecologic</i>	EC1 (direct economic value generated and distributed) 88.7%	DMA2 (market presence) 23.7%
		DMA8 (plant decommissioning) 22.6%
		DMA9 (system efficiency) 18.3%
<i>Social</i>	EN3 (energy consumption within the organization) 82.3%	EN28 (percentage of products sold and reclaimed packaging materials) 23.7%
	EN15 (direct greenhouse gas emissions (scope 1)) 89.8%	DMA18 (transportation) 17.7%
	EN23 (total weight of waste) 76.3%	DMA19 (overall) 24.2%
<i>Human Rights</i>		DMA21 (environmental grievance mechanism) 23.7%
	Labor practices and decent work	
	LA1 (total number and rates of new employee hires and turnover) 80.1%	DMA29 (labor practices grievance mechanisms) 24.2%
<i>Society</i>	LA6 (type and rates of injury) 89.2%	
	No indicators above 75%	DMA30 (investment) 21%
		DMA33 (child labor) 18.8%
<i>Product responsibility</i>		DMA34 (forced or compulsory labor) 19.9%
		DMA35 (security practices) 15.1%
		DMA36 (indigenous rights) 15.1%
		DMA37 (assessment) 15.6%
		DMA38 (supplier human rights assessment) 24.7%
		DMA39 (human rights grievance mechanism) 20.4%
	No indicators above 75%	DMA45 (supplier assessment for impact on society) 24.2%
		DMA46 (grievance mechanisms for impact on society) 23.1%
		DMA50 (marketing) 16.7%

Table A1.
Highest and lowest
coverage rates in SR
by EUC

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