

Through Output Effectiveness of Private Transnational Governance Regime, to Evaluating Environmental Corporate Sustainability Reporting According to the Global Reporting Initiative

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ABSTRACT

The increasing adherence to self-regulatory behaviour of Multinational Enterprises under Private Transnational Governance Regimes has been viewed as a step in the right direction in the improvement of Corporate Sustainability Reporting. Hence, I investigate the output effectiveness of Global Reporting Initiative (GRI), environmental corporate sustainability reporting practices in accordance with the GRIS (GRIS) with a set of mixed methods and Benchmarking Scoring System. The results show that GRI has been overall successful in terms of output effectiveness by increasing the quality and quantity of the disclosed information, and in increase of the corporate capacity to incorporate GRIS. However, the output effectiveness has also been proven to result in unregular report contents indicating that corporations manage to comply with GRIS – Core Option of reporting, but with great discretion in terms of the quality and amount of specific content disclosures found within the GRIS. As GRI still lacks the absolute enforcement power of its sustainability reporting standards due to its voluntary regulatory regime nature, it remains incapable of addressing the ‘governance gap’ on its own.

Key words: Corporate Social Responsibility, Environmental Sustainability Reporting, Global Governance, Global Reporting Initiative, Governance Effectiveness, Private Transnational Governance Regime.

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ACRONYMS

BENCHSS – benchmarking scoring system

CO - Core Option

CSR – Corporate Social Reporting

EVMOD – Evaluatory Model

GLOGOV – Global Governance

GOVGAP – Governance Gap

GRI – Global Reporting Initiative

GRIGL – GRI Guidelines

GRIS – GRI Standards

MNE – Multinational Enterprise

PCSRT – Political CSR Theory

PTGR – Private Transnational Governance Regime

SI – Sub indicator

SR – Sustainability Reporting

TAI – Total Accounting Index

TOCH – Theory of Change

TS – Threshold Score

1. INTRODUCTION

This introductory section is to provide for an understanding of the problem under investigation, the context and the construct of the study, the need, purpose, and significance of it.

1.1. Contextual Background

Multinational Enterprises (MNEs) have increasingly involved themselves in self-regulatory behaviour by voluntary submission to 'Private Transnational Governing Regimes' (PTGR). The reason for such obedience is rooted in the attempt of MNEs to shield themselves from possible state governance intrusions into their currently large and relatively unhindered freedom of conduct within the field of Corporate Social Responsibility (CSR) and Sustainability Reporting (SR). In this conflict of interest between the MNEs goal to remain under as little regulation as possible, and the inability and unwillingness of states to regulate them, Global Reporting Initiative (GRI) has emerged as a PTGR attempting to minimize the occurring governance gap (GOGAP). In tackling this issue, GRI has been promoting its SR standards in order to provide for more standardized reporting on sustainability issues. In turn, these standards have become the world's most trusted and widely used guidelines for SR, helping organizations to understand and communicate their impacts of business on sustainability issues such as environmental degradation and climate change. By incorporating these standards, MNEs can measure and understand their most critical impacts on the environment, economy, and society.

1.2 The Need and Purpose of the Study

The previous literature on GRI and SR has paid critically little attention to the crucial element of effectiveness of environmental information policies in affecting the scope and content of the information disclosures within the reports. Cause for such research gap has been due to the seldom and undetailed studies of non – financial reports and reporting practices. It is here where this research draws its value and significance as its purpose is to find out about the effectiveness of GRI in increasing the accountability and transparency of MNEs environmental SR.

1.3 Research Construct

In order to succeed in this research endeavour, research has been constructed around a comparative case study with mixed methods comprising out of the two MNEs from the technology - computer sector in Taiwan, alongside the theories of Political CSR and Change. Firstly, each corporation's sustainability report has been analyzed as a unit for itself; after that,

reports have been compared against each other, to finally be compared to GRI environmental standards for answering of the research question Is the Private Transnational Governance Regime -GRI- effective in holding MNEs accountable for their Corporate Sustainability Reporting according to the GRI Guidelines?. It is valuable and crucial to conduct such a comparison as it gives us much-needed insight into the inner workings of the relationship between the GRI as a PTGR and the MNEs SR performance in accordance to the GRI Standards (GRIS). These two corporations are ideal for comparison as both originate from the small island nation of Taiwan, are involved in the field of computers sector, are of substantial size, are legally constricted by the same legislature, and are majorly dependent on the supply chain of manufacturing facilities situated in mainland China.

1.4 THEORETICAL FRAMEWORK

The following section provides for the theoretical rationale and the perspective of the study, guiding the logic of the research conduct.

1.4.1 Political CSR Theory

As the author had a particular research interest at hand, it had to be accompanied by appropriate and well-fitting theory. A theory that could explain the relationship between the MNEs and PTGR is the Political CSR theory (PCSRT) and is thus chosen for this study (Garriga & Mele, 2012, p. 51 - 57; Halliday & Shaffer, 2015).

PCSRT argues that economic activities, both those at the national and international level, are dependent on well-functioning institution and in the majority of cases, this has been provided for by the sovereign states being the monopolist on force within its borders (Cutler, 2001, p. 133 - 150; Held et al, 1999). State, having the absolute right to construct laws and regulations within its territory, is also the one who guides the domestic economic activity through its institutions (Held & McGrew, 1993, p. 261 - 288). As such, it holds the authority to outline its economic and political relations with other states through international agreements and institutions (Krasner, 1988, p.66 - 94). Consequently, it can use institutions to govern international economic activities. However, globalization has increasingly challenged such state governance structures. Thus, “where states were once the masters of markets, now it is the markets which, on many crucial issues, are the masters over the governments of the states” (Strange, 1996, p. 4). The weakening of the state and its dominance has allowed for the emergence of many authorities in the transnational arena, blurring the responsibilities between

public and private sectors (Held & McGrew, 1998, p. 219 - 245; Korbin, 2009, p. 349 - 374; Scherer & Palazzo, 2011, p. 899 - 931). Therefore, the world has become more politically fragmented while at the same time, economic interdependence has become greater than ever before due to the “the dramatic increases in the cost, risk, and complexity of technology in many industries render[ing] even the largest national markets too small to serve as meaningful economic units” (Korbin, 1998, p. 361).

The new emerging system of governance is significantly shaped by “the apparent assumptions by MNEs and global business associations of roles traditionally associated with public authorities” (Ruggie, 2004, p.502). Such PTGRs operate through nonstate market-based frameworks in order to address what is a wide range of their external corporate activities ranging from supply chains, human rights, and environmental issues (Vogel, 2010, p.68 – 87). MNEs, by providing welfare and other benefits to the people beyond their narrow economic role contribute not only to the production of public goods but have simultaneously become political actors in their own right (Crane & Matten, 2005, p. 166 – 179). Such development is increasingly seen in none – western MNEs, as in China and Taiwan, as they seek to increase their influence over the international institutional environment (van Tulder, 2010, p.201). A crucial part of MNEs nonmarket strategy has emerged to be their business political behaviour or corporate political activity (Hillman et al., 2004, p. 837–857; Lawton et al., 2012, p. 86 – 105). Corporate political activity has been defined as corporate activities to; “influence electoral and legislative/regulatory processes so that the outcomes of those processes better reflect the internal goals of the organization” and “the responsibility of enterprises for their impacts on society” (Baysinger, 1984, p. 249).

The development of TPGR has been emphasized as a highly promising solution to the innate shortcomings of state regulation; however, they have also been sharply criticized because voluntary business regulations are typically incapable of dealing with market and regulatory failures (Vogel, 2010, p. 79). Nevertheless, private governance has been argued to be a more inclusive and effective form of governance regime as corporate codes tend to improve corporate environmental practices (Haas, 2004, p. 1-15; Locke et al., 2007, p.21 – 40; Scholte, 2002, p. 281). However, a potential problem simultaneously occurs with private governance as corporate involvement in forming of governance structures becomes increasingly separated from what is democratically legitimate structure of state law (Scherer et al., 2012, p.473 – 514). TPGR has been especially criticized for its lack of insufficient

transparency and accountability (O'Rourke, 2003, p.1-29), its weak enforcement and limited firm inclusion across sectors (Vogel, 2010, p. 68-87).

As the PCSRT is occupied by issues found at the macro level, it tells us about how different government actors and corporations act and what their motivations might be, however, what this theory lacks is a clear framework for the evaluation of the effectiveness of the governance and the different instruments that ought to fill the GOVGAP which is found on the micro-level. Here, therefore, in the section that follows, an additional theory is applied to take over where the PCSRT reaches its limits.

1.4.2 The Theory of Change

The Theory of Change (TOCH), even though usually viewed as a form of critical theory, can also be viewed as a type of a specific methodological framework which is logical. It is used for evaluative purposes of different programs and policies by different government actors, aid and development organizations in the advancement of social change (Brest, 2010, p. 1-10). Firstly, It aids the evaluator in defining the long term organizational goals, thereafter it allows the evaluator to engage in the process of backward mapping, meaning, one begins with the already set out long - term goal/outcome and then works back towards the identification of the earliest preconditions or requirements that need to occur for achievement of the outcome (Clark & Taplin, 2012, p.2). Thus, it explores the process of change as it explains the connections between the outcomes and the reasons for why one outcome is necessary as a prerequisite for the achievement of another. This is quite the opposite of the traditional planning practices where planning starts with the question of: "What preconditions must exist for the long-term outcome to be reached?" rather than with: "What activities can we be doing to advance our goals?" (Clark & Taplin, 2012, p.2). Prerequisite to this theory is that every effectiveness measurement requires a specifically designated indicator of success, as in this case, this is achieved through the scoring system and the effectiveness presets.¹

In order to make TOCH operational, it is crucial to accompany it with an evaluatory model which will serve as the conceptual, logical model helping us to illustrate GRI's contributions on the level of output effectiveness. The entire model is presented in more detail in the section below.

¹ Note; effectiveness pre-sets refer to the output effectiveness, pre-sets are presented under each objective.

1.4.3 The Evaluatory Model

The model (EVMOD) applied in this research to evaluate the outcome effectiveness of GRI, stems from the field of International Relations literature as proposed by Easton (Easton, 1965, p. 196 – 198), further developed by Underdal and Young (Underdal & Young, 2004; Young, 2002, p. 73-77), and put in a methodological context by studying the ‘World Bank Institute Evaluation Group’s’ literature on “Results Chain” (WBI, 2007). The successfulness of this model has been demonstrated in a study by Barkemeyer, Preuss, and Lee, where they looked at the effectiveness of GRI at the international level (Barkemeyer et al., 2015, p.312–325). Nevertheless, it is important to mention that the evaluatory model in this paper has been uniquely modified and expanded by the author to fit the specific purposes of the research and thus, it brings an alternative research approach to the field of study.²

With the help of EVMOD, the effectiveness of GRI PTGR can be analyzed through the distinctions between the output, outcome, and impact effectiveness, alongside the set objectives accompanying each of the above. EVMOD can be further described in more detail as following;

OBJECTIVES / INPUT > OUTPUTS > OUTCOMES > IMPACTS

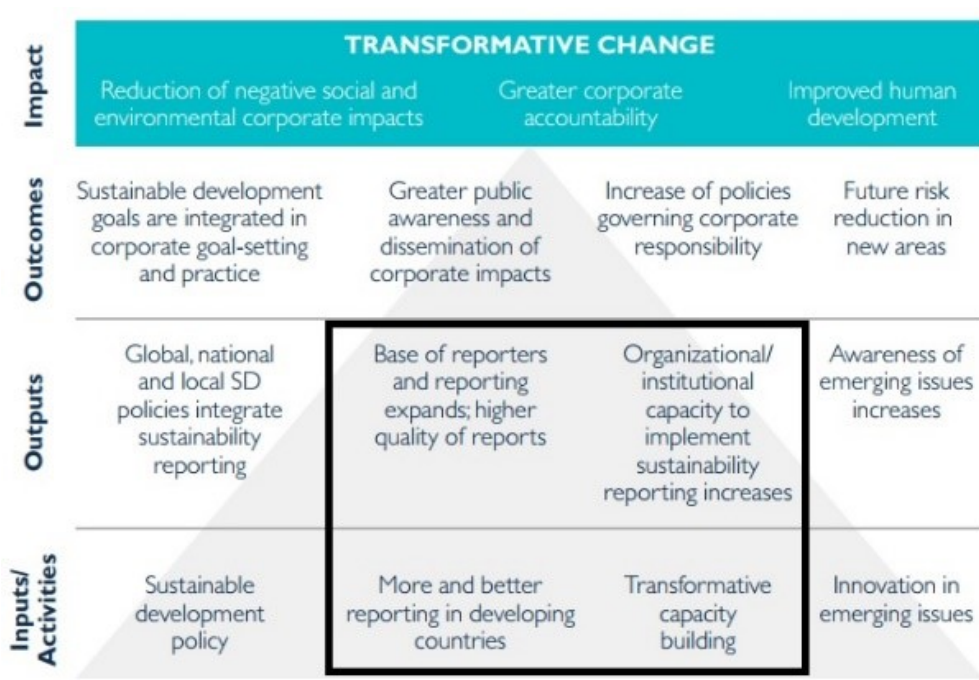
GRI promotes GRI Guidelines (GRIGL) / GRIS to pursue certain Objectives/Inputs; if GRI accomplishes its planned objective, it will hopefully succeed in delivering the amount of its service (GRIGL) that it intended, this being the Output. After that, if GRI accomplishes its planned activity to the extent it intended, then its beneficiaries (MNEs) will benefit in a certain way, this being the Outcome. After that, if these benefits to beneficiaries are achieved, then certain changes in the corporations reporting practices might be expected to occur, this being the Impact (WBI, 2007).

The operationalization of this model is presented in the analysis chapter. The entire model utilized by GRI can be seen in the table below with the markation of the sections on interest for this paper. However, even if this model offers a clear structure for a large scope of what can be achieved in reference to it, a necessary delimitation had to be made. This study focuses only on the inputs and the output segments found in the model. This initial stage is crucial as it set the stage for further research on the outcomes and Impacts levels.

² The model has been improved with the addition of the objective’s criterion and its adjacent positioning to the Political CSR theory.

In the figure below, we can see the Theory of Change and the evaluator model as utilized by GRI. It serves as the conceptual logic model illustrating GRI's contribution to the output, outcome and impact level. The area of interest for this paper is demarked within the figure.

Figure 1. GRI EVMOD (GRI, 2016, p. 28)



1.4.4 GRI Principles

This section elaborates in more depth and detail on why the problem of GLOGOV deficit is of pressing concern and academic interest.

GRI attempts to increase the standardization of corporate reporting practices and thus, its primary goal is to enhance the quality, rigour, and utility of SR (GRI, 2002, p.i). It achieves this through its GRIGL, which incorporate an extensive set of reporting principles consisting of performance indicators and sub-indicators (Sis) (GRI, 2006, p.4). For GRIGL to be successful, enforcement has been of critical importance taking place through reporting itself and in addition to inspections by other private authorities. In situations where enforcement is lacking or is of poor quality, MNEs are faced with consequential sanctions consisting of withdrawal of certifications, damage to public reputation and brand name (Crane et al., 2008, p. 411). However, of equal importance, is the fact that corporations choosing to opt-in GRI are given the ability to measure and report on their environmental impacts with higher quality and

transparency. Through this process, MNEs have been able to gain a certain level of accountability in terms of their corporate performance and sustainable development goals (GRI, 2006, p.4).

Since its establishment in 2000, GRI has become the main prescribing body in the field of CSR (Etzion et al., 2010, p.1092–1107; Levy et al., 2009, p. 88-115; KPMG, 2013, p.10). GRIGL contributes to the enhancement of credibility and accuracy of sustainability reports and thus has been widely accepted by thousands of companies (KPMG, 2017). GRIGL stipulate a set of principles around which the process of creating a sustainability report takes place and furthermore, they specify the actual content of the reports where the most critical impacts, be they positive or negative - on the environment, society and the economy are reported on (GRI, 2019). GRIGL also provide for applicable rules used for the definition of reporting boundaries and materiality issues (GRI, 2019). Even if GRI provides for the guidelines, it is up to the corporations to tailor their reports to the characteristics of their business operations, taking into consideration the informational needs of their stakeholders. GRIGL have, therefore, become the standards to follow and to evaluate the environmental performance against (Crane et al., 2008, p.181). GRI is particularly involved in the promotion of the expression of stakeholder engagement and dialogue procedures in order for the reporting process to be transparent.

Through the two options of reporting, those being “The Core” (CO) and “The Comprehensive” options, GRIGLs give the corporations a choice of adhering to a set of minimum standards of information disclosure which are to form a base content that is to be present in the sustainability report. There are 36 ‘GRI Sustainability Reporting Standards’ out of which 8 concern the environmental topics belonging to the ‘GRI 300 Series’ of standards.³ As such, GRIGL is intended to promote MNEs SR in accordance with CO being the minimum baseline asking for at least 1 indicator per standard to be reported on, while at the same time, MNEs are given the freedom to tailor their reports to the context-specific information requirements of their stakeholders (GRI FAQ, 2015). In turn, stakeholders benefit of such approach as: “information serves as an instrument of private civil regulation by mobilizing its recipients to demand certain performance levels and providing a channel for transparency and accountability” (Levy et al., 2009, p.49).

³ For a complete list see Table 2.

1.4.5 CSR, Globalization and Government Deficit

Global Governance (GLOGOV) refers to the multi-layered and multi-actor system of global authority, and as such, it deals with institution building, rule creation, and enforcement. With its soft power infrastructure of norms, it holds stakeholders against certain expectations attached to their participatory status. CSR, being a multi-sector and multi-level system comprised of expectations, standards, rules, and norms, is one example of this kind of governance governing corporate behaviour (Crane et al., 2008, p. 437-8).

Due to the structural imbalance that has been created between the size and the power of MNEs, and often the weak ability, capacity, and willingness of governments to regulate them, a 'governance deficit' has emerged (Newell, 2002, p.908). It has been argued that economic globalization, being measured by the growth of international trade and the expansion of international investment, has been responsible for its creation (Newell, 2002, p.908). Even with this gap being obvious, there is yet no strong enough global governance institution beyond the nation-state itself that could take on the task of absolute defining and imposing rules and mechanisms towards penalizing deviant corporate behaviour. In turn, corporations have been left to their own devices in dealing with ethical questions arising out of their business operations in addition to finding robust solutions in response to them. Subsequently, without much oversight, MNEs have been able to take advantage of the 'governance deficit', wielding great power without necessarily having to show for any increase in their accountability (Crane et al., 2008, p. 423-4). Yet, they have been aware that if they did not make any attempts in finding solutions to social and environmental problems resulting out of their own operations, governments may indeed step in and increasingly take on the regulatory responsibility themselves. In turn, this would result in additional corporate obligations and costs, restricting their freedom of business conduct, especially so in the field of CSR and SR. To avoid this scenario, many companies have preferred to be one step ahead of the government legislation or intervention by anticipating social pressures themselves, and hence, being able to develop their own policies in response. Some corporations have even begun redefining legal standards and their compliances with society's morals and norms. However, by increasingly involving themselves in societal governance, they have also assumed a politically enlarged responsibility (Crane et al., 2008, p.425). Thus, they have stepped into what can be termed as a 'sub-political' role (Crane et al., 2008, p.307-9).

By helping to address political problems in collaboration with the state and civil society actors, solutions for societal challenges are no longer within the context of the political system but have become incorporated in decentralized processes that accommodate non – state actors such as corporations. Therefore, corporations need to be unmistakably understood as both economic and political actors (Crane et al., 1998, p.426-7).

With corporations taking a greater interest in societal governance, additional policy space for CSR has also been created. It is precisely within this “space” CSR and GRI have gained influence in acting as catalysts in creating an effort to counter the increasing reluctance of national governments to impose regulations on global firms. This has become increasingly important as in some situations; states have even preferred to remain inactive and in favour of self-regulatory behaviour as it lowers the political and financial costs of creating and enforcing regulations. Governments have been fearing that imposing additional regulations could result in a discouraging domestic investment making their economies less competitive (Crane et al., 2008, p.308-9). Therefore, governments have been seeking to share responsibilities with MNEs, either due to the capacity overloads or because they do not hold the workable solutions for societal demands and issues taking place. Thus, there has been a recognition of a need for the establishment of the values of business sustainability and integrity in both policymaking and business decision making where in fact, GRI can help regulate these within the internal organizational processes resulting in more transparent and sustainable business development and management (Sharma, 2013, p.223). Consequently, CSR has taken a new form of ‘an alternative to government’ serving as ‘a means of filling gaps in governance that have arisen with the acceleration of liberal economic globalization (Crane et al., 2008, p.483-4).

1.5 RESEARCH QUESTION

This paper aims to answer the main research question of; Is the Private Transnational Governance Regime -GRI- effective in holding MNEs accountable for their Corporate Sustainability Reporting according to the GRI Guidelines? Two sub-questions aid in answering the main question; 1. What is the MNEs Approach Towards Stakeholder Inclusiveness and Materiality Assessment? and 2. What is the Quality and Quantity of Environmental Information Disclosed Through the Sustainability Reports of MNEs due to the GRI Guidelines?’.

1.6 LIMITATIONS AND DELIMITATIONS

- The standards and indicators incorporated in the research are only those that the companies have claimed to have reported on, and that pertain to the environmental

impacts caused by the corporation's internal activities; meaning that there might be other indicators within a GRI standard which have not been incorporated into the study as the corporations themselves have not reported on them. One exception is 'Supplier Environmental Assessment' as even though Asus has not reported on it, it has still been used for comparison between the two, due to its importance as an indicator for the study.

- The weight attribution for the qualitative and quantitative data was dependent on the contents within the standard itself, and as such, could not have been affected by the author, resulting in 29 Qualitative and 31 Quantitative indicators.
- A prioritization needed to be made in situations where an SI could have been a fusion of Qualitative and Quantitative data, priority was given to the quantitative type of data, and it was assigned the attribute of a Quantitative indicator. This has been done because quantitative data is critical for measuring the output effectiveness of GRI. It helps the author to understand the magnitude of the problem in the form of hard data.
- It is essential to define the extent of research dealing with the quality of the disclosed information. In this paper, quality refers to the content within reports in terms of its adherence to GRIGL and the amount of it, but not the information itself.
- In dealing with the 2nd sub research question, there exists a limitation to the extent of the scope of the question; measurable variables can be measured only at a certain point in time, within cases, in cross-case and case vs GRIGL manner as reports from previous years for comparison are not a part of the research. Furthermore, the number of indicators per standard has been set by adhering to the requirement within the GRI – core option itself; minimum 1 indicator per standard.
- When it comes to the qualitative assessment of the SIs, the research criterion for that aspect has not been defined according to the GRI quality criterion, but the specially developed scoring – benchmarking system.
- Due to the word and time limitation, the scope of this paper is delimited to the Evaluator Model – Output Effectiveness. Without this initial step, no other steps of evaluator model can be conducted. It serves as the steppingstone for any following research that might follow.
- Data analysis software Nvivo was not used as it proved to be of limited use.
- The mixed method in this study remains at the technical level, where different data is generated from different procedures.
- Compliance aspect refers to the Indicators in reference to the CO.

- As this case study research deals with a topic within a specific geographical area and context, the more holistic picture will emerge with complementary studies.

1.7 ETHICAL STAND

In this research, no human subjects were taking part. Thus, ethical considerations do not directly apply to this paper as otherwise might have been the case. Even so, The Swedish Research Council's guidelines "*Good Research Practice (2017)*" has been taken notice of. Furthermore, even though the author is confident in the research methods chosen and employed in this research, he is also aware of possible limitations to this research brought by the extent of his knowledge and research skills interpretation. Therefore, in order to limit unwanted failings in the rigour of the research, the author was under regular and qualified supervision by a senior research supervisor at Lund University on a weekly and biweekly basis through February, March, April and May 2019.

There have been no intentional omissions of results that the author was aware of. The author was not under any partiality in dealing with the corporations or the GRI, has remained as unbiased and as objective as possible without having any personal, commercial, political, academic, or financial conflicts of interest. Furthermore, the author has not been aware of any other research being carried out in the same manner, scope, and extent at the time of finalization of the research. Finally, the mantra the author was persistently inspired by, was by Prof. Meleis:

"a scholar is a person who has a high intellectual ability, is an independent thinker and an independent actor, has ideas that stand apart from others, is persistent in her quest for developing knowledge, is systematic, has unconditional integrity, has intellectual honesty, has some convictions, and stands alone to support these convictions" (Meleis, 2012, p.7).

1.8 LITERATURE REVIEW

In this section, previous research on the topic will be presented, and the research gap will be highlighted. Furthermore, the research problem will be further described, and the value of this research will be promoted.

The interest for this research problem has arisen due to the author's great curiosity about the MNEs modus operandi in the field of CSR while at the same time, the author wanted to gain a greater understanding of the impacts of corporate business operations on the environment. In the authors view, this is an area of research equally crucial for both those involved in business

and those who stand outside of it, as the former unavoidably affects the later and because changes in the environment and climate change affect all humans globally.

It is argued, that by having access to information about the sustainability of a corporation, different stakeholders “can assess risks to companies’ business models and... express their views in the market” while policymakers can use this information to “learn from markets’ reactions and refine their stance, with better information allowing more informed reactions, and supporting better policy decisions including on targets and instruments” (Carney, 2015, p.9).

Social responsibility activists and investors have promoted information disclosure, and transparency as important factors for changing corporate behaviour, especially so as corporate business activities continue to affect the environment (Williams, 2016, p.69). New governance standards as GRI have attracted a fair amount of attention from academics from a wide range of fields leading to a substantial increase in the literature on the topic over the last thirteen to eighteen years (Benneer & Olmstead, 2008, p.117,129; Fung et al, 2008; Lobel, 2004; McCarty & Moring, 2015; Schaffer, 2018, p.2; Shamir, 2011, p.313). However, the research gap arises as there has not been a great deal of research focusing on the effectiveness of environmental disclosure policies and especially so, there has not been any research of this type done regarding the Taiwanese computer sector MNEs. The lack of research on this topic has been further voiced by Delams and Lessem stating how: “despite the popularity of environmental information policies, we still have little understanding of their effectiveness” (Delmas & Lessen, 2014, p.353-4) and, as stated by Levy et al “[there is a] widespread agreement that non-financial reports are rarely studied in any detail” Levy et al., 2009, p.82). Thus, due to the lack of research, the question of how effective GRI as a TNGR is in expanding environmental information within corporate SR is of importance for the enhanced understanding of the issue at hand. Better information would help the market and the stakeholders to adjust themselves efficiently in the situation where multiple parameters influence the speed of transition to new investor preferences, physical events, supportive public policy environment and technological advancements aimed at environmental preservation (Carney, 2016).

Furthermore, with more clear, comparable, consistent, efficient and reliable information about corporations current environmental impacts and the strategies corporations plan to employ towards a “net zero world” of the future(NYT, 2007), both governments and

markets would be able to employ better tools to manage the transition towards a global low-carbon economy (Carney, 2015). Another important reason for this study is the understanding that the lack of accuracy, comparability, and reliability of the information in sustainability reports limits the usefulness of that information for the stakeholders. Moreover, with the lack of such, the corporations' own ability to respond to environmental impacts emerging from their business activities is diminished. In order to manage the impacts properly, they would first need to have a clear measurement of them. Thus, by managing what gets measured, the world has a better chance of breaking the "Tragedy of the Horizon."⁴

GRI itself is aware that SR, according to the GRI framework, has not necessarily resulted in a more systematic consideration of environmental issues in corporations' decision-making processes. GRI observes this in its five years plan stating how it is time to move on beyond just reporting; "Our focus has always been on the reporting process and the value of the information that comes from it. While the sustainability report remains a crucial output of the reporting process, we must now move beyond the report itself to ensure that decision-makers have access to the high quality and reliable information they are increasingly demanding..." however," for this information to truly empower sustainable decisions in every organization, it must be more accessible, comparable and available in real-time" (GRI, 2015, p. 3-4).

Regarding previously conducted research, the author has neither been able to find the readily available body of evidence showing that corporations are making improvements in their environmental performance because they have been engaging in voluntary information disclosure according to GRI or any other framework (Clark et al., 2015; Schaffer, 2015). This would have been beneficial as to increase the understanding of the connection between the information disclosure and the GRI as a regulatory framework.

Only one study has been using a case study approach to compare 'Coca Cola' and 'Anglo – American' sustainability reports focusing on the external informational structure of the reports (Eccles & Serafin, 2015). They conclude with a two-way argument which stands in agreement with other research in the field; the regulation is extremely important for an effective information function as much as it is necessary for the establishment of accounting standards. Furthermore, they argue that if regulation ought to be more prescriptive and rules-

⁴ 'Tragedy of the horizon': See; <http://tragedyofthehorizon.com/>

based, the risk of reporting would manifest itself more as a compliance exercise (Eccles & Serafin; 2015).

Some research suggested that firms with better environmental performance usually disclose more environmental information. However, it has not been proven that it is due to the disclosure itself that the companies achieved better environmental performance. Instead, the research showed that companies with better environmental performance decided to disclose more information, but with emphasis on the objective facts about their performance (Clarkson et al., 2006, p.303-327).

On the other hand, empirical studies investigating the relationship between, i.e. the CSR and better financial performance and lower costs of capital have been plentiful and abundant, and many of these studies have evaluated the companies' commitments to sustainability through their financial reports (Clarkson et al., 2006, p.303-327). Studies about investors reactions towards a more extensive scope of CSR disclosure have also been plentiful (Clarkson et al., 2006, p.303-327). In contrast, the research focus on the environmental aspect of corporate social responsibility and environmental materiality reporting has remained very limited and scarce.

1.8.1. Previous research on GRI

One study conducted by Dingwerth and Eichinger compared GRI reports from the automotive industry with the attempt to evaluate if the information being produced by corporate sustainability reporters could be used in the same way as GRI proposes; namely, to affect corporations' decisions, to empower stakeholders and to promote sustainability (Dingwerth & Eichinger, 2010). They reached a conclusion stipulating that all companies included in the study claimed to have covered all GRI greenhouse gas indicators in full. However, it turned out that the information companies provided proved to be of limited practical use. Studies by Levy et al., Hedberg & von Malmborg have encountered similar issues with the comparability of the information disclosed in other reports (Levy et al., 2009; Hedberg & von Malmborg, 2003, p. 153,163). Other research by Milne et al. evaluated the efficiency of GRI in promoting actual sustainability, finding serious gaps arguing how the quality and the completeness of many GRI sustainability reports are not high (Milne et al., 2012, p.19).

Even if it might seem that GRI has not accomplished much at all since it started, other scholars such as Clarkson et al have argued that GRI promotes systematic and useful reporting

by encouraging information disclosure of objective facts about the environment and other performances rather than soft statements referring to their commitment strategies and management approaches (Clarkson et al., 2006).

1.8.2 Previous research on technology sector induced environmental impacts.

The main focus of previous research has been placed on the environmental aspects of air - carbon footprint and pollution, chemicals, energy, resource consumption, water, solid and hazardous waste (Greenpeace, 2017; Reynolds, 2009; Villard, 2015, p.98-109; Li, 2019; Plepys, 2004, Li et al, 2019). The International Finance Group, a sister organization to World Bank, has in its ‘Environmental, Health, and Safety Guidelines for Semiconductors & Other Electronics Manufacturing Guidelines’ identified environmental issues resulting out of the semiconductors and other electronics manufacturing including the following; hazardous material use and waste management, air emissions, wastewater, energy use and general process modifications (IFC, 2007).

Moreover, in research conducted by Voicu, only 3 papers out of 172 reviewed explicitly included environmental aspect with data of qualitative nature as a dimension of Corporate Environmental Performance (Voicu, 2018, p. 1124–1157). Other research on the topic has also raised the issue of the lack of qualitative data (Olmedo et al., 2015; Hassel et al., 2005; Jacobs et al., 2010). This further strengthens the argument for the need of undertaking of this research.

1.8.3 Previous research on materiality topics identified by reporters and stakeholders

GRI conducted a research project in 2013, to collect documentation from different stakeholder groups which identified sustainability topics considered to be relevant to them. In total, 194 organization) related to 52 different stakeholder groups were a part of the study (GRI, 2013. The research generated 2812 topics which were related to stakeholder groups with over 600 documents supporting 1612 unique topics identified through the process. Among others, the collected information was also related to the technology hardware and equipment sector globally. There were just three organizations included in the research from the Asian region, with two being related to business and 1 to mediating institution, amounting to just 2% of the entire organizations participating from which suggestions for the research came (GRI, 2013, p. 14). There were seven most essential topics identified by the technology and hardware stakeholder group presented in the table below.

Table 2. identified topics by stakeholders in the GRI Report (GRI, 2013, p.106-7).

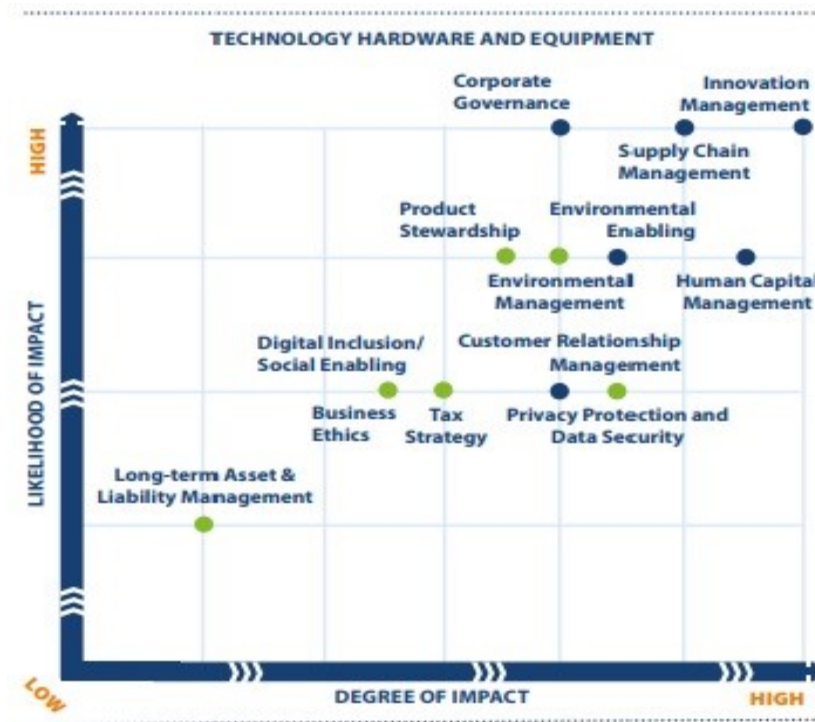
Sustainability Category	Proposed Topic	Topic Specification	Constituency
Environmental	Hazardous materials		Business
	Plastics use and management		Civil Society Organizations
	The energy efficiency of end products	Life Cycle Assessment (LCA)	Mediating Institutions
	Emissions to air – GHG emissions	“Clean Rooms” ⁵	Business
	Emissions to air - GHG emissions	Management and reduction strategies	Mediating Institution
	Electronic waste (e-waste)	End-of-life products - Disposal, recycling, and reuse	Business
	Chemicals emissions	Electronic Equipment	Mediating Institution

Other GRI research focused on the issue of what is material and to whom. 39 reports from the sector were analyzed, out of 391 topics were classified as sustainability topics, with 28% of the topics falling into GRI’s Environmental category (GRI, 2015). From the reporter’s perspective; the most frequently reported GRI category was, in fact, the environment with the aspects of emissions, effluents, waste, energy and materials being the most reported on (GRI, 2015, p.3). On the other hand, from the investor - stakeholder perspective, the most important materiality aspects were the Environmental Enabling and Environmental Management (GRI, 2015, p.11). Regardless, both actors were interested in the environment management with research showing an overall high degree of overlap between the reporters and investors perception of what a material topic is (GRI, 2015, p.19). Why there is overlap is due to “the fact that companies that identify and report on the most material topics are likely to have a relatively advanced understanding of the views of their internal and external stakeholders, conducting their reporting with the input and influence of those views” (GRI, 2015, p.19).

⁵ Clean “areas.” For chip production

In the materiality matrix below, one can see the 13 most important material issues for the technology sector emerging out of the GRI research.

Materiality Matrix (GRI, 2016. p.19).



A research report from 2009 by the Ministry of Economic Affairs, ‘Taiwan’s Present and Future Prospects of CSR Report’ identified the issues of most concern to Taiwanese companies with regards to CSR being; Protection of the environment, 85.1 %, Improvements of CSR disclosure and transparency, 80,9 % and Strengthening partnership with stakeholders, 58% (Sharma, 2013, p.234).

A research conducted in 2015 by the ‘World Business Council for Sustainable Development’ published a study ‘Reporting Matters: redefining performance and disclosure’ in which assessment was made on the reporting characteristics of 169 reports by some of the world’s largest companies. A set of criteria was used including principles such as materiality and completeness; content such as accountability, governance and performance, and experience; such as accessibility, concluding that organizations using GRIS performed overall better against the set criteria (WBCSD, 2015).

Other research was also taken notice of; however, it was not included due to the lack of research transparency (Ellis, 2000, p. 17-21).

2. RESEARCH METHODOLOGY

This section elaborates in greater detail about the research design and how it applies to the study. It will explain the procedure for collecting, analyzing and reporting of the data and why the methods and design are appropriate for the solving of the research problem.

2.1 Data Collection

Relevant Academic material has been collected through reviewing already existent literature dealing with the topic of SR. Sources found within reviewed academic journals and published books that directly and indirectly lead to the issue of interest have been followed up. Additionally, course syllabus of a previous academic course on CSR has been used as a source of condensed and highly relevant material that has been used to shed light on the contents of the problem (Crane et al., 2008).

Searches have been made by using Google online search motor, and it's more academically specialized online search motor 'Google Scholar. Additionally, Lund University's own online digital library LUBsearch has been used for the same purpose. Within the already gathered material, searches have been done by targeting specific words and phrases with the help of program Agent Ransack⁶ in order to filter through data and locate the most relevant data fragments and sections. This method has also helped with the shortening of the time-consuming process of manual index searches. Furthermore, a record of references (titles of books or periodicals) has been kept, including the authors, articles, books, journals, magazine, publishers' names, relevant page numbers and years.⁷ Any citations, quotations or paraphrases, alongside all other referencing of the sources with the exact page numbers when possible, has been achieved using the reference software product 'Mendeley.'⁸ It has also served the purpose of assisting with keeping track of gathered references. The program creates databases that store the references which can then be further sorted and exported. Electronic sources need to be entered manually. However, the stored sources can then be clicked-upon to immediately bring up the document in the program itself, which is of usefulness while dealing with the task of creating a reference database.

Value of the material has been decided by evaluating the publisher, year of the publishing, if the text has been peer-reviewed and if the journal it is found in is reputable within

⁶ Agent Ransack, Release Build 867. <https://www.mythicsoft.com/agentransack/>

⁷ Note; With the help of Mendeley.

⁸ Mendeley Desktop, V. 1.19.4. https://www.mendeley.com/?interaction_required=true

the academic community. The titles of the material were compared in direct correlation to my research topic. In cases where first-grade material might lead to other sources with possible relevant literature, it has become a source of a second grade. The material necessary for the primary analysis section was obtained through the GRI's webpage and sustainability reports from the firms' web homepages. The material was obtained from these databases by simply visiting their webpages and downloading the readily available documents. The selected reports are the companies' latest sustainability reports, which are structured and done according to the GRIS CO of reporting. In cases where additional external material was necessary, that material has also been included, however only if it was directly connected to the sustainability report and the environmental issues.

The target key search words have been; GRI + standards, CSR + reporting disclosure, materiality topics, stakeholder engagement, GRI principles, CSR responsibility, CSR corporate behaviour, the effectiveness of + transnational governance systems and regimes, sustainability, sustainability reporting, environmental CSR disclosure, output + outcome + impact effectiveness.

Inefficient multiple double searches were avoided by keeping a separate log where all search terms have been noted down along with the names of authors and the titles of material. After that, a decision was made about which material was to become a part of the core supporting literature based on its relevance and validity.

2.2 Mixed methods approach

Previous research surrounding the topic of GRI, CSR, and environment has been conducted with a variety of different methods and approaches. Most common out of these have been based on content analysis, correlational analysis, regression analysis with primary material in the form of annual social responsibility reports, environmental and sustainability reports, and web sites (Sopkauskiene & Leitonien, 2015). Previous research employed qualitative or quantitative methods or both. However, the research proved to be unsystematic as the researchers chose to use different research techniques with different classifications of information, making different final research results difficult to compare.

Within the scope of this paper, all of the methods above were initially potential candidates for this research. However, the author was looking for a specific set of methods that would be best suited for the purpose and the research problem of the study. Thus, with this

particular intent in mind, chosen methods could be directly coupled to the research needs at hand, while playing a crucial role in multiple aspects within the research design.

The research form in this paper is based on a set of mixed methods of qualitative and quantitative nature. It is done so due to the assumption that integration of qualitative and quantitative methods within the same study can be seen as complementary to each other, especially so if the research aims to determine the performance and efficiency of a program, policy or a standard (Dzurec, 1989; Greene et al., 1989, p. 255–274). Furthermore, the inclusion of both types of research are crucial aspects of any environmental reporting and should not be left out as it has been the case for the majority part in previous research.

Rigour in quantitative research is reflected in conciseness, narrowness, and objectivity, leading to adherence to research design and precise statistical analysis, while qualitative rigour is associated with openness, subjectivity, adherence to a theory, and thoroughness in collecting data. However, qualitative research methods have been criticized for a lack of rigour. This has occurred due to the attempts to judge qualitative research methods rigour using the same rules developed for the judgment of quantitative research. Thus, one must keep in mind that the rigour criterion is to be defined differently for qualitative research because the desired outcomes are of a different type (Burns, 1989, p 69-77; Morse, 1989, p. 14-22; Sandelowski, 1986, p.27-37). However, in order for qualitative research to be rigorous, the researcher must engage in the process of ‘deconstructive knowledge.’ Nevertheless, both types of research are systematic.

In order to judge the value and efficiency of the GRI framework according to the research questions, the author employs different methods that will generate supportive evidence and enable him to draw conclusions and make decisions. This research framework is utilized towards obtaining qualitative and quantitative information about environmental sustainability issues found in MNEs sustainability reports. The primary aim of these techniques is to measure the kind, quality and quantity of environmental sustainability information disclosed within the reports.

Thus, the first segment of the methodological framework is based on a benchmarking – scoring system (BENCHSS) (Nikolaou & Tsalis, 2103, p. 78-86) which enables the researcher to quantify the information systematically. However, it does not provide for enough qualitative details to the extent that the author deems sufficient as results remain numerical.

Therefore, methodology continues with the descriptive content analysis techniques focusing on the codification of sentences and pages of disclosed information concerning the content, or to the kind of disclosure which is of qualitative or quantitative nature (Bell & Bryan, 2011, p. 288-311). In turn, this approach increases the available amount of both types of data. The next segment, the cross-case analysis (Bell & Bryan, 2011, p. 63), on the other hand, helps us to cross-compare cases at a single point in time in order to collect qualitative and quantitative data in connection with several variables which are then examined to detect similarities and differences, patterns and associations (Bell & Bryan, 2011, p. 53). Finally, with the help of resulting data gathered through previous research methods, the segment of evaluator model dealing with the output effectiveness is used in order to evaluate the effectiveness of GRI reporting as a private transnational governance mechanism which is rooted in evaluative research (Easton, 1965; Underdal & Young, 2004; Young, 2002). With other words, both quantitative and qualitative data serves the purpose of the evaluator effectiveness model where the model also takes a form of a tool for further result structuring of the obtained information. The evaluation of effectiveness itself must be based upon comparing the effects of a measure (i.e., output) to its explicitly stated objectives. These objectives may be expressed in general or specific terms, but the most useful evaluations of effectiveness require objectives to be expressed as clearly as possible. A more detailed explanation of each segment is presented in the following sections below.

2.3 Benchmarking – Scoring System

2.3.1 Indicator System

The first component of the proposed BENCHSS technique is the indicator system. The indicators' selection and the structure of the scoring system are crucial components for most types of BENCHSS. As such, these components have a direct impact on the adequacy and effectiveness of the benchmarking techniques in assessing the completeness and transparency of the reports in question. Taking into consideration this important prerequisite needed for an optimal BENCHSS, the chosen methodology combines a predefined set of GRI indicators which are derived from 'GRI Environmental Standards' (GRIS) (Gris, 2019) along with the objective scoring system. In such a way, the credibility and validity of the benchmarking system have been increased.

GRIS are intended to help MNEs in their reporting practices by guiding them through the reporting process with the aim of MNEs reaching a higher accuracy and quality level of

disclosed information about their various aspects of corporate responsibility in their sustainability reports. Thus, the chosen methodology adopts GRIS: GRI 301 – Materials, GRI 302 – Energy, GRI 303 – Water, GRI 305 – Emissions, GRI 306 – Effluents and Waste, GRI 307 – Environmental Compliance and GRI 308 - Supplier environmental assessment, which uniformly focuses on corporations’ environmental issues.

The main concern for the indicators’ selection process was that the final set of indicators and SIs had to the greatest extent possible cover a wide range of aspects associated with the sustainability performance of environmental material topics for both corporations. The selected indicators needed to be present in both sustainability reports in order for them to be comparable. Thus, 7 indicators with a total of 60 SIs were selected to gather reliable information through sustainability reports published by MNEs. For the sake of clarity, the aspect of SR which was left out of the analysis due to the issues of incomparability concerns the GRIS dealing with ‘biodiversity’ as none of the corporations has reported on it.

Table 1. in the appendix presents the final GRI indicators with qualitative and quantitative indicators, giving an overview of the indicators quantitative or qualitative nature (Qnt: Quantitative indicator, Qlt: Qualitative indicator).

2.3.2 Scoring System

The second component of the benchmarking – scoring technique utilized in this paper is based on the scoring system, which is used to evaluate the quality and quantity of SR information disclosure. The possibility to benchmark the performance of different environmental material topics is a significant incentive towards corporations’ further improvement in the quality of reporting and environmental responsibility. This benchmarking – scoring technique is based on a revised version of ‘Accountability Index’ (AI) as created by Nikolaou and Tsalis and is slightly modified to suit the purposes of this paper better⁹ (Nikolaou & Tsalis, 2013, p.76-86). This scoring system is relatively uncomplicated and is comprised out of four – level measurement scale ranging from 0 – 3:

- 0 points (Level 0): no information is disclosed for a specific indicator;
- 1 point (Level 1): qualitative/quantitative information is available to a smaller extent for a specific sub indicator or when a qualitative/quantitative sub indicator is present but not in the form required by the corresponding GRIS;

⁹ The system was expanded up to level 4 from original level 3.

- 2 points (Level 2): qualitative/quantitative information is disclosed for a specific sub indicator as required by the corresponding GRIS; This is also the minimal optimum level.
- 3 points (Level 3): sustainability report discloses information which shows visible progress of environmental performance for a specific sub indicator (e.g., information is disclosed for the last years indicator to benchmark present performance, or information is disclosed on a previous managerial approach which can be contrasted with the current one).

Due to the descriptive nature of qualitative sub-indicators and the complicated assessment procedure of the environmental material topics disclosure, the attempt to assess the actual performance of the qualitative indicators carries an analytical risk of its own. Thus, with this in mind, the author has chosen to engage in the evaluation process on the content level with GRIS as the core to which to compare against, understand and analyze the content at hand. In such a way, the author has been able through logical analysis come to an understanding of the company's adherence levels for each indicator.

Regarding the Accountability Index (AI) and the total number of the selected SI, the Total Accountability Index (TAI) can be calculated as the sum of the scores achieved across all GRI SI where 's' represents the number of qualitative sub-indicators, and 't' represents the number of sub quantitative indicators.

Table 5. Equation

$$TAI = \sum_{s=1}^{29} AI_{QLt} + \sum_{t=1}^{31} AI_{Qnt}$$

The scores range from 0, when no information is disclosed for a specific SI, to 180 when a sustainability report fully discloses all aspects of sustainability performance including the information which shows visible progress of environmental performance for all quantitative and qualitative SI. Thus, TAI measures the level of disclosure in terms of both quality and quantity of the information disclosed within a particular corporate sustainability report. Furthermore, the mean score of each category was defined as an upper limit score, which indicates the minimum acceptable level of reporting performance.

From the table below, we can see the number of standards, indicators, Sis in reference to the Threshold Score (TS).

Table 3. Overview of the standards, indicators and sub-indicators in reference to TS.¹⁰

Standard	Description	Qualitative performance Indicators (s) (Scoring Scale: 0-3)	Quantitative performance Indicators (t) (Scoring Scale: 0-3)	Max Score	TS
GRI 301	Materials	1	1	6	3
GRI 302	Energy	4	7	33	16.5
GRI 303	Water	5	3	24	12
GRI 305	Emissions	14	12	78	39
GRI 306	Effluents and Waste	2	3	15	7.5
GRI 307	Environmental Compliance	2	0	6	3
GRI 308	Supplier Environmental Assessment	1	5	18	9
	Total nr. of Indicators: 60	29¹¹	31¹²	180¹³	90¹⁴

Table 4. Indicators¹⁵

ASPECTS OF SUSTAINABLE ENVIRONMENT	TOTAL NO. OF POSSIBLE GRI INDICATORS	NO. OF INDICATORS ANALYSED IN THIS STUDY	TOTAL NO. OF POSSIBLE GRI SI	TOTAL NO. OF GRI SI ANALYSED IN THIS STUDY
ENERGY	5	1	21	11
WATER	3	1	12	8
EMISSIONS	7	4	36	26
EFFLUENTS AND WASTE	5	1	12	5
ENVIRONMENTAL COMPLIANCE	1	1	2	2
MATERIALS	3	1	4	2
SUPPLIER ENVIRONMENTAL ASSESSMENT	2	2	6	6
TOTAL	26	11	93	60

Table 5. A number of indicators Reported on by corporations.¹⁶

ENVIRONMENTAL INDICATORS REPORTED ON BY MNES OUT OF ALL POSSIBLE INDICATORS PER STANDARD	ACER	ASUS
MATERIALS GR 301	301-1, 301-2 (2/3)	301-1, 301-2 (2/3)
ENERGY GRI 302	COMPLETE (5/5)	302-3 (4/5)
WATER GRI 303	COMPLETE (3/3)	303-2 (2/3)
EMISSIONS GRI 305	305-7 (6/7)	305-4, 305-6, 305-7 (4/7)

¹⁰ Based on the Appendix Table 1.

¹¹ (TOTAL INDICATOR SCORE =29sX3p=Max 87p)

¹² (TOTAL INDICATOR SCORE =31tX3p = Max 93p)

¹³ (SCORE RATIONAL 60IX3p= Max 180p)

¹⁴ (SCORE RATIONAL 180p/2 (50%) = 90p)

¹⁵ Note; for a full list of indicators and SI see Appendix Table

¹⁶ Based on Appendix Table 1.

EFFLUENTS AND WASTE GRI 306	306-3, 306-4, 306-5 (3/5)	306-4, 306-5 (2/5)
ENVIRONMENTAL COMPLIANCE GRI 307	COMPLETE (1/1)	COMPLETE (1/1)
SUPLIER ENVIRONMENTAL ASSESSMENT GRI 308	COMPLETE (2/2)	308-1, 308-2 (0/2)
SCORE %	MAX SCORE 26 OBTAINED 22 (84.6%). ¹⁷ REPORTED ON 84.6% % OF POSSIBLE GRI ENV. STA. IND.	MAX SCORE 26 OBTAINED 15 (57.6 %). REPORTED ON 57.6% OF POSSIBLE GRI ENV. STA. IND.
DIFFERENCE: Acer vs Asus	Acer vs. Asus; Acer +27%¹⁸	

2.4 Content Analysis

In this paper, the content analysis is defined as "an approach to the analysis of documents and texts that seeks to quantify content in terms of predetermined categories in a systematic and replicable manner" (Bell & Bryan, 2011, p.289). It takes the form of both qualitative and quantitative nature and is connected to the benchmarking - scoring system. The quantitative method is viewed as a method where numerical data is obtained and used through data collection and data analysis processes (Saunders, 2009, p.151), while qualitative research is viewed as an interpretive approach to create an understanding of a phenomenon (Ritchie and Lewis, 2003. p.3). The goal of the qualitative content analysis is to provide knowledge and understanding of a specific process which is studied by analyzing the content or contextual meaning of the text with research questions taking the form of what and how much (Hsieh & Shannon, 2005, p. 1277-1288; Bell & Bryan, 2011. p. 292).

As such, this research approach has been extensively used in the understanding of sustainability research and for determining both the extent and nature of corporate SR. Consequently, reports are critically analyzed by using the GRIGL as comparison material in discerning the extent to which the sustainability reports adhere to the GRIS. Thus, this approach enables the author to gain a greater understanding of the concept of materiality in the context of sustainable corporate reporting and to discern between the omissions in the report coverage and the actual contents of the report (Bell & Bryan, 2011. p. 292). This is of interest as it becomes clear what is, and what is not, vital to the MNEs regarding their environmental commitment. Thus, content analysis in this paper focuses on the codification of sentences and pages of disclosed information concerning the content, or to the kind of disclosure which is of qualitative or quantitative nature.

¹⁷ $100 / 26 = 3.84, 3.84 \times 22 = 84.6$

¹⁸ $84.6 - 57.6 = 27$

2.5 Comparative Case Study Design

This research design is focused on studying two individual cases using the same methods. The primary purpose is to provide for an understanding of a particular phenomenon comparatively. Thus, in the comparative case study analysis, cases are compared and contrasted. Multiple case studies are also used for verification of a hypothesis which is also present in this research (Bell & Bryan, 2011, p. 63).

2.5.1 Cross-sectional design

Cross-sectional design format falls under comparative design (Bell & Bryan, 2011, p. 63). When an evaluation includes multiple studies of similar cases, i.e. individuals, groups, locations, programs, and policies, three distinct stages of analysis are to be conducted. First, each corporate report is analyzed individually to understand it as a separate entity. After that, a cross-case analysis is conducted, comparing, and contrasting the results from different reports. The aim is to seek explanations, similarities, and differences, and to gain a deeper understanding of a phenomenon in different contexts (Bell & Bryan, 2011, p. 66). After that, the results are compared to the GRIGL themselves, in order to establish the extent of the omission and the inclusion of the resulting informational content within the reports. This process is similar to triangulation and also yields similar benefits: greater confidence in findings and the minimization of potential bias. The difference is that while triangulation can happen within a single case study, cross-case analysis requires more than one comparable case study within a single evaluation (Bell & Bryan, 2011, p. 63).

2.6 Evaluative Research

Evaluative research can be conceptualized as a research study that uses standard social research methods for evaluative purposes, as a specific type of research methodology, and as an assessment process that utilizes special techniques unique to the evaluation of organizations, programs, services, and policies among others. Evaluation, according to Weiss is “the systematic assessment of the operation and the outcomes of a program or policy, compared to a set of explicit or implicit standards, as a means of contributing to the improvement of the program or policy” (Weiss, 1998, p.4). In this paper, evaluative research is based on the use of output effectiveness, the benchmarking system, the GRIS, quantitative and qualitative

methods, and is of summative type looking at what GRIGL have accomplished in terms of its stated objectives.

Summative evaluatory research encompasses both qualitative and quantitative methods, which play a crucial role in the performance effective evaluation. Greene, Caracelli, and Graham claimed that “underlying the notion of a mixed-method approach appears to be the pragmatic assumption that to judge the value of a social program or policy, an evaluator should employ whatever methods will best generate evidence of the warranted assertability of the program or policy” (Greene et al, 1989, p. 255). This type of research is conducted because we are interested in the evaluation of the GRIGL and what the resulting data can offer, i.e., description of GRIGL impacts, increase of their efficiency and usefulness for more effective decision making (Powell, 2006, p.103-4). The Theory of Change is also applied on this level.

2.7 Sample Selection

The sample consists of 2 MNEs within the Computers Sector in Taiwan (China). The criterion for selection was based on multiple factor criterion; 1. The corporations needed to use GRIS – Adherence Level: CO in their SR. 2. The reports needed to be in a language understandable to the author, which in this case was the English language. 3. The sustainability reports needed to be the latest version published by the corporations; in this case, reports are from the year 2017. 4. Reports needed to be externally assured as such assurance provides for greater transparency and credibility of the information. 5. The reporting corporations must have submitted their sustainability report to the GRI Report Database on a previous occasion as such act signifies their understanding of GRIS and their application. 6. Corporations sustainability reports needed to be readily publicly available from their home webpages in character format, enabling the information extraction digitally. 7. Corporations report needed to contain a section dealing with materiality assessment, the stakeholder identification, and engagement relating to the topics of this paper. 8. Enterprises needed to be of MNEs type as such are more likely to produce reports in the first place.

The number of corporations has been limited to two, due to the nature of this research, which is based on a cross-case analysis study. As such, its purpose is to deal with the selected cases in depth, rather than in width. Furthermore, in this research, corporate sustainability reports, the corporations, and GRI are viewed as units of analysis. The company reports were exclusively analyzed in reference to environmental impacts created within corporations’ operational activities themselves.

3. GLOBAL GOVERNANCE AND CSR IN TAIWAN

3.1 Governance Deficit and CSR

In recognition of the governance deficit and the rapid economic growth which came at huge environmental costs, both the Taiwanese government and the Taiwanese MNEs have been impelled to promote, adopt and practice CSR. This attitude has been further embraced due to the understanding that additional environmental costs are to occur if no action was taken (Sharma, 2013, p.33). Taiwanese companies have thus chosen to move in the right direction in at least some aspects recognizing the environment as their most pressing issue with regards to their CSR (Sharma, 2013, p.48).

Due to Taiwan's position as a highly important market for foreign investment with its export-oriented high-tech industry, it has consequently increased the pressure on MNEs to adapt GRIS (Sharma, 2013, p.223). Market share has been a key driver for improvement and communication of Taiwanese MNEs CSR performance, especially for those aiming at exporting and retailing in global markets. Another driving factor for Taiwanese increase in CSR performance has originated from its largest trading partner, mainland China. This situation has occurred due to China's shift towards more sustainable business practices regulated under the 'harmonious society' policy (Sharma, 2013, p.223). Due to the strong international business relations within the economy, particularly due to the 'Taiwanese Technology Sector' supply chain being mainly found in mainland China, there has been an increase in pressure for the development of CSR, because of the ever-growing need for strengthening of the competitiveness of the Taiwanese economy globally, and between the companies domestically and internationally (Sharma, 2013, p.223). The government has actively promoted the CSR, but it has let multilateral agencies and quasi-government regulatory bodies such as GRI take over (Sharma, 2013, p.29). This choice of strategy has been of vital importance for Taiwan, and its MNEs as a deliberate effort to incorporate global practices in firms' decision makings are a potential source of competitive advantage in the longer run (Detomasi, 2007).

Currently, Taiwan is one of the few governments and stock exchanges in the world that are leading the way in SR policies. The 'Taiwan Stock Exchange' (TWSE) and its 'Corporation Rules Governing the Preparation and Filing of Corporate Social Responsibility Reports' has put forward rules for listed companies at the stock exchange where it is mandatory for large enterprises with a capital of at least USD310 Million to incorporate GRIS into their reports

(GRI, 2016). Furthermore, they should specify whether the reports have been externally assured or not. Both Acer and Asus are represented at the TWSE (GRI, 2016).

However, even with the acceptance of self – regulation under GRI, Taiwanese companies continue to suffer from the ‘Confucian family ties’ resulting in corruption and cronyism within business relationships (Sharma, 2013, p.223). Corruption within MNEs has been recognized as a growing concern for Taiwan and Asia overall and has presented a major obstacle to CSR strategy in business. As corruption often takes place within the government and business, it contradicts the CSR ethos of ethical behaviour. Taiwan is no exception to corruption; it ranks on the 31st place on the ‘Transparency International’s Corruption Perceptions Index 2018’, with a score of 63 out of 100 (Transparency, 2018)¹⁹, and furthermore, on the ‘Bribe Payers Index’ it shared its 19th place in the latest report from 2011, with Turkey and India with a score of 7.5 out of 10 (Transparency, 2011).²⁰

Regarding corporations under investigation, both Acer and Asus are Taiwanese multinational computer and phone hardware electronics companies with headquarters in Taipei Taiwan. They are the world’s 5th (Asus) and 6th (Acer) largest PC vendors in the world, according to Gartner (Gartner, 2019). According to the 2018 ‘Taiwan International Brand Value List’ released by ‘Taiwan’s Ministry of Economic Affairs,’ Asus is on the 1st place for best ‘Taiwanese Global Brand’ being worth USD 1.619 billion, and Acer taking the 9th place with the worth of USD 406 million (Interbrand, 2018; Taiwan News, 2018).

Out of the two, Asus is the larger company, employing 16,000 employees and serving in more than 70 countries with established operating bases in more than 50 of them (Asus, 2018). It has manufacturing facilities in the city of Taipei, Guishan, Luzhu, and Nangan in Taiwan, and Suzhou and Chongqing in Mainland China, with additional ones in Cluded Juarez in Mexico and Ostrava in the Czeckia (Asus, 2018). Acer, on the other hand, employs 7000+ employees and has manufacturing suppliers in Taiwan, Brazil, China, Hungary, India, Indonesia, Malaysia, the Philippines, Thailand, and Vietnam; however, the primary production base remains in mainland China (Acer, 2019). When it comes to the CSR environmental sustainability aspects, both corporations are fairly similar and can be easily compared as presented in the CSR describe characteristics of the corporations as presented in the table below.

¹⁹ 100 being worst, 0 being best

²⁰ 10 being best, 0 being worst

Table 6. Descriptive characteristics of corporations and sustainability reports (Acer, 2018; Asus, 2018).

Company	Country of Origin	Industry Sector	Size	Report Assurances	Reports Year	UNSDG	Inventory of Sustainability Issues
Acer	Taiwan - China	Computers	MNE	SGS Taiwan, AA1000 AS (2008) Type 2 High Level, ISA3000, GRIS CO and PricewaterhouseCoopers (PwC) Taiwan.	2017	Goals: 3, 4, 7, 8, 10, 11, 12, 13, 16.	GRIS, ISO, UNSDG, DJSI, SASB, MSCI SRI, MSCI ESG, GeSi. RBA, FTSE4Good, CDP
Asus	Taiwan - China	Computers	MNE	SGS Taiwan, ESG Taiwan, KPMG, ISAE3000, and GRIS CO, AA1000.	2017	Goals: 3, 4, 11, 12, 13.	GRIS, ISO, RBA, UNSDG, DJSI, FTSE4Good, MSCI SRI, CDP, GeSi.

4. ANALYSIS

This section outlines the main results from the assessment of the computer corporations' sustainability reports and answers the research questions. As the information disclosed has been measured through the benchmarking scoring system with the help of the final score of TAI and other methods, it has been possible to present the level of disclosure in terms of both quality and quantity.

The analysis section is constructed as follows²¹; Firstly, the two sub-research questions are first answered in order to gather enough data and evidence to be able to answer the final research question. Secondly, under each sub research question, a description of the importance of the research question for the study is outlined, thirdly, a detailed description of the data uncovered and the data that was analyzed is presented, fourthly, both the objective and effectiveness aspects correlating directly to the research question are presented; fifthly, the findings consisting of data uncovered and analyzed, along with the answer to the research question is presented, and sixthly; the results of the hypothesis testing is presented.

²¹ Note; if applicable to the type of the question

4.1 Sub - Research Question nr 1. What is the MNEs Approach Towards Stakeholder Inclusiveness and Materiality Assessment?

In this first part of the analysis, we will look at the stakeholder and materiality assessment.

4.1.1 Importance of the Research Question

It is of importance to answer this sub-question because it will allow us to gain a better understanding of the relationship between the informational needs of stakeholders and the creation of such by the MNEs according to the GRIS. Additionally, this section provides essential data for a better understanding of the resulting data of the following research questions as well. The criterion for answering this question is informed according to a set of GRIS which are crucial for the understanding of the two aspects of stakeholder inclusiveness and materiality assessment.²² According to GRI itself, “identification of stakeholders and considerations of their needs is of central importance... since the stakeholders who are expected to use the report will become the reference point for many decisions regarding the preparation of the report” (GRI, 2006, p.6).

4.1.2 Findings

Stakeholder Engagement

According to the GRI reporting requirements, when making decisions about the report, the corporation is to consider the expectations and interests of its stakeholders, and their information needs while deciding if the topic is material or not.²³

List of Stakeholder Groups

Acer and Asus have identified the following stakeholders to whom they consider themselves accountable;

ACER	ASUS
Advocacy organizations, academic groups, charitable groups, communities, customers, employees, government agencies, industry associations, investors, media, and suppliers (Acer, 2017, p.18).	Academia, employees, community, shareholders, investors, suppliers, outsources, customers, media, government, and NGOs (Asus, 2017, p.6).

²² Note; For full list of standards see; GRI 102-40,42,43,44, principles for defining report content can be found in gri 101 – foundation.

²³ Criterion for such is according to GRI 102-40,42,43,44, 46,47 and GRI 101 foundation.

Process of identifying and selecting stakeholders.

Both Acer and Asus have described the process for defining and selecting their stakeholder groups by applying the ‘AA1000 Stakeholder Engagement Standard’ to establish the *engagement* process, *identify* the stakeholders and further *communicate* with them (Acer, 2017, p. 18, 20-21; Asus, 2017, p.6).

Approach to stakeholder engagement.

Acer and Asus have disclosed the information about their stakeholder engagement through the means of communication, being: documents, information, presentations, reports, and website, consultations through: a feedback mechanism, meetings, and surveys, through dialog: forums, leaders meetings and workshops, and through cooperation: multi-stakeholder initiative and partnerships among others.²⁴

Key topics and concerns raised.

Acer has reported ‘Advocacy Organizations’ as the stakeholder group that has raised the topic of Energy and Climate Change (Acer, 2017, p.20). It has used the same principle of information disclosure for all other stakeholder groups and topics choosing not to disclose the names of the stakeholders, but instead to state the stakeholder group. Asus, on the other hand, has not categorized stakeholder groups according to their raised concerns, which makes it difficult to conclude their interrelations (Acer, 2017).

Acer has responded to the environmental materiality issues by continuing to sponsor Carbon Disclosure Project (CDP) spring and autumn promotional presentations in Taiwan, and by continuing participation in the CDP supply chain program inviting major suppliers to participate and fill in questionnaires (Acer, 2017, p.20). Asus, on the other hand, engaged in global recycling through its “Refurbished Computer and Digital Training Program” and it is “Zero Waste to Landfill” program (Asus, 2017, p.19, 24). Both Acer and Asus have through their reports mentioned their understanding of climate change, they have disclosed their management strategies for energy and water resources, emissions, wastewater and products, their participation in UN’s Sustainable Development Goals - Climate Action, by presenting a variety of: environmental labels, volunteering activities, energy and climate change targets, strategies for managing greenhouse gases in supply chain, by identifying global climate change

²⁴ For a full list see Asus, 2017, p 6 and Acer, 2017, p. 18-21

and various extreme weather phenomenon as a risk, and by engaging in circular economy (Acer, 2017. p.40, 56, 58, 72, 77, (72-81), 104, 109; Asus, 2017, p.8-30, 46-59).

Both Acer and Asus use the outcomes of stakeholder engagement to define their report contents. However, none of the corporations has explicitly stated if the report content is due to a specific outcome of the stakeholder engagement process, which affects the clarity of the report. In the section where corporations have provided the necessary information, they have informed stakeholders in what can be described as an acceptable manner as they followed the reporting principles for defining report content and its quality (GRI 102, 2016, p.102-40,42,43,44, 46,47; GRI 101, 2016).

Materiality Assessment

According to the GRI reporting requirements, the corporation is to explain the process of defining the report content and the topic boundaries, and how it has implemented the reporting principles for defining the report content (GRI 102, 2016, p.34, 35).

Explanation of the process for defining the report content and the topic boundaries.

Acer used the GRIS as the framework for establishing a process for identifying material sustainable development topics and providing the information upon which CSR report disclosures have been based (Acer, 2017, p.22). Acer has used a procedure for ends of this task; it has first investigated which topics are of concern for stakeholders through open online and company internal surveys through which Acer collected 27 topics with 495 valid surveys returned. After that, Acer determined the relative priority of material topics by analyzing the returned survey using the opinions of internal stakeholders and senior management on the issues as a baseline for assessing the level of importance to 9 categories of external stakeholders for each of the issues. Then, a matrix of material issues has been created and submitted to the corporate sustainability officer with the priority results verified by an audit. Finally, the process of defining the report content and the topic boundaries has been achieved through pairing material issues with GRIS aspects. Thus, Acer was able to identify material topics for the disclosure and their boundaries (Acer, 2017, p.22).

Furthermore, Acer has also referred to a table where it has provided a complete list of “Material Topics and Boundary Identification” (Acer, 2017, p.24-26). Reporting principles have been implemented by following the GRIS and including an index of GRIS indicators and report content (Acer, 2017, p.3). Asus has analyzed and screened environmental materiality

issues through the process of materiality using the same framework of identification, prioritization, validation, and review as Acer, however with much less detail disclosure (Asus, 2017, p.6). In terms of topic boundaries, it has provided a clear and complete overview (Asus, 2017, p.8).

4.2 Sub - Research Question 2. What is the Quality and Quantity of Environmental Information Disclosed Through the Sustainability Reports of MNEs due to Adherence to the GRI Guidelines?

In this second part of the analysis, we will look at the quality and quantity of information.

4.2.1 Importance of the Research Question

This second sub - research question deals with the 1st aspect of the evaluator model; the ‘Output Effectiveness.’ As such, it can give us the results on the quality and quantity of the information, and how GRI increases the transformative capacity building of corporations’ SR.

4.2.2 Objective and Output Effectiveness, Hypothesis

- GRI Output Objective

The objective of GRI is to promote;

- 1. The distribution and the quality of the SR
- 2. The transformative capacity building

- Output Effectiveness

Due to the objective above, GRI should contribute to;

- An increase in the quality and the amount of content
- An increase in corporative capacity to implement GRIGL in SR

Posed Hypothesis; quality and quantity of the information disclosed will be beneath the specific TS, on the other hand, the quantity of the information will be satisfactory according to the CO criterion.

4.2.3 Findings²⁵

❖ Quality and Quantity of the Environmental Information Disclosed ²⁶

In this section, we will be quantifying the disclosed information of the sustainability reports by scoring the quantitative and qualitative information concerning the already predefined GRI SI disclosure list.²⁷ Level 0 – 3 point scale puts the SIs in different adherence categories giving us

²⁵ On the basis of the scoring system which was to give results on both the amount and the quality of information disclosed,

²⁶ Note; concerns the content, but not the information itself

²⁷ Note; see the indicator list table 3 and table 7.

an insight into the quality of SIs overall. These are among the most relevant aspects for computer sector corporations as they explain the impacts of their business operations on the sensitive natural resources they directly or indirectly manage and influence, which in turn is one of their main contributions to sustainable development.

➤ **Quality of the SI Information Disclosed**

On this 1st level of quality analysis, we are looking at the adherence of corporations SI to GRIGL within and across their reports, and in reference to GRI SI.²⁸ Also, the results are organized according to the Level sections criterion. Such structuring of the analysis and the results will allow us to see an overall picture of the extent of the quality and quantity of the reported environmental information

- **Quality of SI within individual reports**
 - **Quality of SIs within and across individual reports in reference to the Level division**

Table 6. Adherence of corporations SIs to GRIGL within and across their reports, and in reference to GRI SI according to the Level division.²⁹

	L0	L1	L2	L3
ACER	9 SI; 15% of reported SI have not adhered to the GRIGL by L0 criterion	11 SI; 8.3% of reported SI have adhered to a smaller extent to the GRIGL by the L1 criterion	27 SI; 44.9% of reported SI have adhered fully to the GRIGL by L2 criterion	13 SI; 21.6% of reported SI have included additional information and fully adhered to the GRIGL by L3 criterion
ASUS	19 SI; 31.6% of reported SI have not adhered to the GRIGL by L0 criterion	8 SI; 13.3% of reported SI have adhered to a smaller extent to the GRIGL by the L1 criterion	24 Si; 39.9 % of reported SI have adhered fully to the GRIGL by L2 criterion	9 SI; 14.9 % of reported SI have included additional information and fully adhered to the GRIGL by L3 criterion
DIFFERENCE	10 SI; Asus has adhered to the GRIGL across its SI by 16.6 % less than Acer ³⁰ on L0	3 SI; Asus has adhered to GRIGL across its SI by 5% less than Acer on L1	3 SI; Asus has adhered to GRIGL across its SI by 5% less than Acer on L2	4 SI; Asus has adhered to GRIGL across its SI by 6.7 % less than Acer on L3
SUCCESS BEYOND THE STANDARD OPTIMAL REQUIREMENT OF SI L2;				
Acer has adhered to the GRI Guidelines beyond the standard optimal requirement of L2 by 21.6 % and Asus by 14.9%, which is a comparative divergence of 6.7% in favour of Acer. Acer fell with negative 23.3% below optimal L2, while on L2 and L3 it has a summed result of positive 66.5%. Asus, on the other hand, fell with massive 44.9%, while on L2 and L3 it has a summed result of 55.1%				

²⁸ Note; see the indicator list table 3 and table 7.

²⁹ Based on Apendic Table 2 and 3.

³⁰ Note; Read the results as Acer has reported on x% more of SI, meaning Asus has reported on the same x% less of SI.

From the table above, we can see that Acer has: 9 SI on L0, 11 on L1, 27 on L2, and 13 on L3. This result means that out of the total 60 SI, Acer has not adhered to GRIGL in 15% of its reported SIs, has adhered to some smaller extent on 18.3%, has adhered fully on 44.9 %, and has adhered beyond the standard optimal requirement for SIs³¹ by 21.6%. Asus, on the other hand, has 19 SI on L0, 8 on L1, 24 on L2, and 9 on L3. This result means that Asus has not adhered to GRIGL in 31.6% of its reported SIs, has adhered to some smaller extent on 13.3%, has adhered fully on 39.9%, and has adhered beyond the standard optimal requirement for SI's³² by 14.9 %. Between L0 + L1 and L2 + L3, summed score for Acer is (-23.3%) vs +66.6% which is an difference of **43.3%**³³ placing Acer on the side of overall successful reporting, For Asus, between L0 + L1 and L2 + L3, summed score is (-44.9%) vs +55.1% which is a difference of **10.2%**³⁴ placing Asus on the side of overall successful reporting.

The quantification results show us that the quantitative and qualitative information disclosed by the corporations in terms of integration and assimilation³⁵, it is clear that Acer has put in more effort in adhering to the GRIGL throughout its report and thus, it has reached a higher report quality on all levels in comparison to Asus. The greatest difference has been found on the L0 where Asus has not reported on more than half of SI in comparison to Acer.³⁶

- **Quality of SI within and across individual reports in reference to GRIGL**

On this 2nd level of quality analysis, we are looking at the adherence of corporations qualitative and quantitative SI in reference to GRIGL within and across their reports, and in reference to GRI SI³⁷ through the application of the benchmarking scoring system and the TS of 50% which gives us an more detailed insight in the quality of the information of each SI. The results are presented in the table below and are obtained from tables 3 and 7.

³¹ The standard optimal requirement is the score 2 – L2 where all information is disclosed according to the GRI guidelines requirements.

³² The standard optimal requirement is the score 2 – L2 where all information is disclosed according to the GRI guidelines requirements.

³³ % points

³⁴ % points

³⁵ Quality is consistent out of 2 aspects; 1. Adherence of Corporate Si to the qualitative aspects of GRIGL. 2. Adherence of the Corporate SI to the quantitative aspects of GRIGL guidelines. Thus, for the sake of clarity, quality is divided into two terms; integration for the score regarding the qualitative aspects and assimilation for the quantitative aspects.

³⁶ Note; Acer 9 SI and Asus 19 SI.

³⁷ Note; see the indicator list table 3 and table 7.

Table 7. Quality of qualitative and quantitative indicators.³⁸

ACER	TOTAL NR. OF QLT SI	TOTAL TAI SCORE	MAX SCORE	TS	TOTAL NR. OF QNT SI	TOTAL TAI SCORE	MAX SCORE	TS
RESULT	29	47	87	43.5	31	57	93	46.5
DIFFERENCE	10	54.0% (PASS)	100%	108.0% (PASS)	100%	61.2% (PASS)	100%	122.5% (PASS)
TOTAL INCREASE OF QUALITY FOR QLT AND QNT SIs BEYOND TS TAI +30.5% ³⁹								
ASUS	TOTAL NR. OF QLT SI	TOTAL TAI SCORE	MAX SCORE	TS	TOTAL NR. OF QNT SI	TOTAL TAI SCORE	MAX SCORE	TS
RESULT	29	44	87	43.5	31	40	93	46.5
DIFFERENCE	100%	50.5% (PASS)	100%	101.1% (PASS)	100%	43.0% (FAIL)	100%	86.0% (FAIL)
TOTAL INCREASE FOR QUALITY QLT AND QNT SIs BEYOND TS TAI -12.9% ⁴⁰								
DIFFERENCE: Acer vs Asus		Acer; + 3.5% higher score than Asus ⁴¹		Acer; + 6.9% higher score than Asus		Acer; +18.2% higher score than Asus		Acer; +36.5% higher score than Asus
TOTAL INCREASE IN THE OVERALL QUALITY BEYOND TS +17.6% ⁴²								

From the table above, we can see that Acer has fully passed the quality test as outlined by the TAI score across all quantitative and qualitative SI. In terms of qualitative SI, Acer surpassed the minimum integratory TS with 8%, while on the quantitative side, it has done so with whole 22.5%. Asus, on the other hand, managed to stumble across TAI only regarding the integration of its qualitative SI where it went beyond the minimum integrational TS by a mere 1.1%. However, this was expected as Acer has disclosed more information than Asus regarding the ‘Supplier Environmental Assessment.’ Regarding the assimilation of Asus’s quantitative SI, it has not passed the quality test and has fallen behind the assimilatory TS by 14%. Acer, in comparison to Asus, was more successful in keeping the quality of its disclosed information across SI by 6.9% more on the qualitative side, and with whole 36.5% on the quantitative side. We can see that the greatest overall quality scores for single standards were achieved for the ‘Energy,’ and especially so for the ‘Environmental Compliance’ standard which was also the least demanding standard in the amount of disclosed information necessary. The least overall quality of SI has been reported on Materials and Water, and additionally, in the case of Asus, the Environmental Supplier Assessment. The Companies reported overall quality wise, equally on the aspects of Environmental Compliance, Effluents and Waste, Energy and Material. However, the lowest scores were regarding ‘Materials’ and ‘Water’ standards for both Acer and Asus. In general, the average overall quality of disclosed information in SI for both

³⁸ Based on Appendix Table 2 and 3.

³⁹ (122.5%) 22.5% + (108%) 8% = 30% points, 1% = 1 point; MBN, “What is a percentage point? Definition and meaning”, <https://marketbusinessnews.com/financial-glossary/percentage-point-definition-meaning/>

⁴⁰ (101.1%) 1.1% + (86%) (100% - 86%) = -14%, 1.1% + (-14%) = 12.9% points

⁴¹ 54% - 50.5% = 3.5% points

⁴² 8% + 1.1% = 9.1% qnt, 22.5% - 14% = 8.5% qnt, 9.1% + 8.5% = 17.6% points

corporations have proven to reach the set minimum TS of 50% for 2/2 quantitative set of indicators⁴³ and only for 1/2 in a qualitative set of indicators.⁴⁴

Moreover, collectively, none of the corporations reached at least a satisfactory score of 2 for each SI under any single indicator except for the ‘Environmental Compliance’ one, while doing worst on ‘Effluents and Waste’ 306-1 indicator where no information was disclosed. An explanation for this outcome could be that corporations are not familiar enough with water discharges as this aspect is not associated with their core operations and business but belongs rather to their manufacturer supplier’s domain.

➤ **Quantity of Environmental Information Disclosed**

In this section, we will look at the number of indicators and SI in the reports. We will do so for each report separately, after that, we will cross compare results, and then we will look at the number of SI in reference to the ‘CO’ and the minimum TS. Meaning, on the 1st level, we are looking at the number of quantitative and qualitative SI corporations have included in their reports in reference to the TS. After that, on the 2nd level of quantity analysis, we are looking at how many indicators corporations have reported on in reference to the ‘CO’ which will give us an insight into to the Corporative Capacity to Implement SR.

- **Quantity of Indicators and SI within individual reports**
 - **Quantity of SI within and across individual reports in reference to the TS**

Table 8.⁴⁵ *Quantity of qualitative and quantitative indicators.*⁴⁶

ACER	TOTAL NR. OF QLT SI	TOTAL NR. OF QLT SI REPORTED	TOTAL NR. OF QLT SI NOT REPORTED	TS	TOTAL NR. OF QNT SI	TOTAL NR. OF QNT SI REPORTED	TOTAL NR. OF QNT SI NOT REPORTED	TS
RESULT	29	27	2	15 ⁴⁷	31	25	6	16
DIFFERENCE	100%	93.1%	6.9%	80% MORE (PASS) ⁴⁸	100%	80.6%	19.3%	56.2% MORE (PASS)
TOTAL INCREASE IN QUANTITY OF QLT AND QNT SI BEYOND TS TAI +136.2%⁴⁹								

⁴³ (Acer and Asus)

⁴⁴ (Acer 1 vs Asus 0).

⁴⁵ Follows the same calculation procedure as table j

⁴⁶ Based on the Appendix Table 2 and 3.

⁴⁷ 29 / 2 = 14.5, 14.5 rounded up to 15 as a SI cannot be divided in half.

⁴⁸ 100%/15=6.66, 6.66% x (27 - 15), 6.66% x 12 = 80%

⁴⁹ 80% + 56,2% = 136,2% points

ASUS	TOTAL NR. OF QLT SI	TOTAL NR. OF QLT SI REPORTED	TOTAL NR. OF QLT SI NOT REPORTED	TS	TOTAL NO. OF QNT SI	TOTAL NO. OF QNT SI REPORTED	TOTAL NO. OF QNT SI NOT REPORTED	TS
RESULT	29	23	6	15	31	18	13	16
DIFFERENCE	100%	79.3%	20.7%	53.3% MORE (PASS)	100%	58%	42%	18.7% UNDER (FAIL)
TOTAL INCREASE IN QUANTITY OF QLT AND QNT SI BEYOND TS TAI +34.6% ⁵⁰								
DIFFERENCE.: Acer vs Asus		Acer; 13.8% more than Asus ⁵¹	Asus; 13.8% more than Acer	Acer; 26.7% ⁵² more than Asus		Acer; 22.6% more than Asus	Asus; 22.7% more than Acer	Acer; 37.5% more than Asus
TOTAL INCREASE IN THE OVERALL QUANTITY BEYOND TS FOR ACER AND ASUS +170.5% ⁵³								

On this 1st level of analysis, If we look at the quantity of the information disclosed within qualitative SIs, it is clear that both companies have reported on the same SIs in the majority of cases with Acer going beyond the TS requirement by whole 80% more, and has reported on 13.8% more SI than Asus. Acer managed to report on all qualitative and quantitative SI while Asus failed in assimilatory segment falling below the TS by 18.7%. Acer reported fully on qualitative SI aspects of Energy, Water, Environmental Compliance and Environmental Supplier Performance, while Asus has done so only for the aspect of Environmental Compliance. Additionally, even if not part of the analysis, neither reported on the final standard of Biodiversity in the Environmental 300 Standard series. Regarding the overall amount of the quantitative indicators, again, Acer took the lead with 56.2% above the required TS, and 37.5% more so than Asus, which is a significant comparative divergence. Beyond that, Asus failed to reach the minimum TS for its quantitative SI by a whole 18.7%.

○ **Quantity of Indicators within and across individual reports in reference to the Core Option**

On this 2nd level of analysis, with the help of the analysis conducted in Table 9 below and Appendix Table 2, we can see how many indicators corporations have included in their reporting in reference to the Core Option. Corporative Capacity to Implement SR⁵⁴

⁵⁰ 53.3% -18.7% = 34.6% points

⁵¹ 93.1% - 79.3% = 13.8% points

⁵² 1 Percentage points = 1%, 80% - 53.3% = 26.7% points

⁵³ 80% + 53.3% = 133% qlt

56.2% - 18.7% = 37.5% qnt points

133% qlt + 37.5% qnt = 170.5% points (qltqnt)

⁵⁴ This section also gives us an additional insight into the quantitative aspect of the first part of then question dealing with the amount of the content.

Table 9. Based on Appendix Table 1.

ACER	NUMBER OF INDICATORS PER STANDARD AS REQUIRED BY THE CO	MINIMUM NUMBER OF INDICATORS OUGHT TO BE INCLUDED FOR ALL 7 STANDARDS	NUMBER OF INDICATORS INCLUDED IN THE REPORT	NUMBER OF INDICATORS INCLUDED BEYOND CO REQUIREMENT	DIFFERENCE IN % BEYOND CO
	1	7 ⁵⁵	13	6	+85% ⁵⁶
ASUS	NUMBER OF INDICATORS PER STANDARD REQUIRED BY THE CO	MINIMUM NUMBER OF INDICATORS OUGHT TO BE INCLUDED FOR ALL 7 STANDARDS	NUMBER OF INDICATORS INCLUDED IN THE REPORT	NUMBER OF INDICATORS INCLUDED BEYOND CO REQUIREMENT	DIFFERENCE IN % BEYOND CO
	1	7	12	5	+71%
DIFFERENCE IN NUMBER OF INDICATORS BEYOND CORE OPTION REQUIREMENT (ACER VS ASUS)					
ACER HAS DISCLOSED + 14% MORE INDICATORS IN COMPARISON TO ASUS. ⁵⁷					
The total increase in the overall quantity beyond the TS due to GRI for Acer and Asus;					
+156% ⁵⁸					

The Core Option requires that at least 1 indicator is reported on per identified materiality topic - standard. Out of the results, it is obvious that both Acer and Asus have gone far beyond that requirement and have included 6 vs 5 more indicators than required which is a difference of 85% vs 71% respectively. This is somewhat of a surprise and an unexpected result as none of the companies needed to report on more than 1 indicator per materiality topic according to the Core Option of the GRIS they voluntarily opted in for. Thus, this indicates that the output effectiveness of GRI for the indicator section has proven successful, meaning, GRI has been able to strengthen the ‘Corporate Capacity to Implement SR’ (CCISR).⁵⁹ The number of indicators included is well and beyond the minimum requirement. Beyond the output effectiveness of GRI, an alternative reason for such a high number of indicators might be that both corporations catered for their stakeholders’ informational needs beyond what could reasonably be achieved by the inclusion of the minimum number of indicators. On the other hand, this also indicates that the shareholders might have had a strong influence on the reporting practices of the corporations. In turn, these results consequently increase a corporations’ legitimacy and transparency.

⁵⁵ Note; there are 7 Standards all together and thus, there should be a minimum of 7 indicators, thus, 7 x 1 = 7.

⁵⁶ 100%/7= 14.28%, 14.28% x 6 = 85%

⁵⁷ 85% – 71%= 14% points

⁵⁸ 85% + 71% = 156% points

⁵⁹ Except for 1 indicator for Asus

➤ ***Answer to the Research Question***

- **Quality**

The overall quality of the information disclosed within SI has proven to be satisfactory in reference to the TS with + 17.6%. On the individual corporation level, Acer reached an increase in quality by 30.5% while Asus failed to do so by 12.9%. In reference to levels, Acer found itself on the overall positive side of SI reporting by 43.3% and Asus by 10.2%.

- **Quantity**

Quantity wise, the overall amount of SI surpassed the TS by a massive 170%. On the individual corporation level, Acer reached an increase in quantity by 136.2% while Asus did so by 34.6%. In reference to levels, Acer found itself on the overall positive side of SI reporting by 43.3% and Asus by 10.2%. The overall increase in the number of indicators was exceeded by 156% with Acer doing so by 85% above the Core Option requirement and Asus with 71%.

➤ **Output Effectiveness**

- Increase in the quality and the amount of content

As seen in table 10 and 11. GRI has been successful in increasing the overall quality of the information to a lesser extent, but it has been much more successful in the increase of the amount of information across both SI and Indicators.

- Increase in corporative capacity to implement GRIGL in SR

As seen in table 12 and 13. GRI has been very successful in increasing of corporative capacity to implement GRI guidelines in their SR. The result is solid.

4.2.4 Hypothesis result

Considering the empirical material presented, the hypothesis has been disproved to a large extent and has to be rejected.

5. Answer to the Main Research Question of “Is the Private Transnational Governance Regime -GRI- effective in holding MNEs accountable for their Corporate Sustainability Reporting according to the GRI Guidelines? “

5.1 Objective 1. Regulatory capacity

From the result emerging from the evaluatory model, we can conclude the following; In terms of compliance, both corporations have complied with the GRI CO fully and extensively. This

indicates that GRI was successful in its objective of increasing the capacity of the corporation's ability to incorporate GRIS into their reporting to a very successful extent, by a massive 156% beyond its primary requirement. Thus, the regulatory capacity of GRI in terms of promoting and increasing distribution and standardization of SR has been effective. However, discretion in reference to contents disclosure within the indicators has been discovered. This is discussed in more detail in the section below.

5.2 Objective 2. Quality and Quantity of Si

Corporations have through their reported qualitative, and quantitative SIs reached an overall satisfactory level in terms of quality by +17.6% and quantity by massive 170.5% beyond TS. Overall, GRI has succeeded in its objective of increased distribution and quality of SR.

However, at a closer examination, corporations have not disclosed information uniformly across either type of Sis in quality or quantity, consequently reaching vastly different report contents. As results show, Asus lacked in the quality of quantitative, and quantity of its qualitative Sis, while Acer succeeded across all its SI. This means that corporations have been able to claim to comply with the GRIS, however with great discretion in reference to contents disclosure. The results highlight the inherent inability of GRI to enforce predictable corporate reporting behaviour. Perceptive corporations can incorporate a large number of indicators, and this action can positively affect their accountability; however, it is not a guaranty that the reported information itself is of adequate quality, quantity, and usefulness to the stakeholders in every aspect.

5.3 Governance Gap

With regard to GOVGAP, GRIS poses weak enforcement power, but give an incentive for corporations to progressively develop in their reporting practices. Once they have opted in for the GRIS, they are bound to continue with them as otherwise, they would face unaffordable consequences. In a sense, the status quo creates a way towards more transparency and less uncertain development even though it is not without its flaws. Legal rules and regulations pose much higher enforcement power, but GRIS in such a form would not be appealing to the MNEs due to their eagerness for self – regulation. As GRI does not create an even playfield, reporting practices are as expected very different within and across MNEs both in the extent and nature of reporting and in comparison, to GRIS. Consequently, due to this unevenness, the dysmorphic image of the nature of their business conducts remains. Implications are thus created for

corporations and stakeholders. For corporations, this means that due to their neglect of adequate measurement of their impacts, the risk of improper management of their environmental impacts is increased. Stakeholders are in turn deprived of an opportunity to start with a decent chance in the understanding the information and forming an optimal opinion. In comparison to legal rules and regulations, GRIGL impacts are still very limited, and the lack of proper enforcement leaves for large manoeuvring options with respect to how information is disclosed.

5.4 CONCLUSION

Even if GRI has, to a large extent, succeeded in reference to BENCHSS, there is still much left to desire. Much more needs to be done in terms of increased comparability, high quality and quantity across all standards and Sis. Due to the GRI's lack of absolute enforcement power, governance gap cannot (yet) be plugged with GRIS on their own. Both GRI and Taiwanese corporations need to do more to enhance the synchronisation between themselves, their objectives and outcomes on different levels.

5.5 OUTLOOK

Future research could find many different and interesting veins of research when it comes to the outcome... and impact effectiveness of GRI. Such research would shed more light on how to improve the design of PTGR that is a prerequisite for successful tackling of sustainability issues. It is important to keep up the pressure on both GRI and corporations in order to allow sustainable reporting to reach its full potential.

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APPENDIX

Glossary;

Company / Corporation / Firm / Organization / Multi-National Enterprises

Are used as interchangeable terms for Acer and Asus.

Core Option

Core Option refers to the option for preparing a report and defines a specific extent of disclosures ought to be included in the report; minimum 1 indicator per standard.

Effectiveness

In this paper, effectiveness relates to the output, outcome and impact effectiveness as a means for evaluating the effectiveness of the GRI as a transnational governance regime.

Environmental Issues

Environmental issues can include i.e. biodiversity, emissions, energy, effluents, material use, waste, and water.

Impact

Impact refers to the effects a corporation has on the environment which can, in turn, indicate its contribution in a positive or negative way to sustainable development.⁶⁰

Material Topic

Refers to a topic that reflects a reporting organization's important economic, environmental and social impacts; or that fundamentally influences the assessment and decision makings of stakeholders.

Standard / Reporting Guideline

There are numerous topic-specific standards belonging to different series of standards and are used to report information on corporation's impacts related to its identified material topic, i.e. within GRI 300 Series of Standards on Environment; 'GRI 302: Energy'.

- Indicator⁶¹

The indicator refers to the specific reporting requirements found within the standard, i.e. '302-1 Energy: Consumption within the organization'.

⁶⁰ Ibid

⁶¹ Note; It is important to mention that GRI refers to an 'Indicator' and 'Sub Indicators' simply as a 'Disclosure'.

- **Sub-indicator**, on the other hand, refers to the set of reporting requirements found with the indicator itself which provide more detailed requirements, i.e. ‘a. Total fuel consumption within the organization from non-renewable sources, in joules or multiples, and including fuel types used’. It is important to mention that GRI does not have any definition for ‘Sub Indicators’ and neither does it categorically refers to them in any specific manner.

Stakeholder

Is an entity or individual that can be affected by the reporting organization’s activities, products, and services, or whose actions can affect the ability of the organization to successfully implement its strategies and achieving its goals.

Topic Boundary

Is a description of where the impact occurs for a material topic, and the organization’s involvement with those identified impacts.

Table 1. Indicators grid as obtained from GRIS.⁶² (The indicators where prioritization has been made have been marked with QNT*)

Description	
Standard GRI: 301 Materials	
301-3 Reclaimed products and their packaging materials	
a. Percentage of reclaimed products and their packaging materials for each product category.	QNT
b. How the data for this disclosure have been collected.	QLT
Standard 302: Energy	
302-1: Energy consumption within the organization	
a. Total fuel consumption within the organization from non-renewable sources, in joules or multiples, and including fuel types used.	QNT
b. Total fuel consumption within the organization from renewable sources, in joules or multiples, and including fuel types used.	QNT
c. In joules, watt-hours or multiples, the total: i. Electricity consumption ii. Heating consumption iii. Cooling consumption iv. steam consumption.	QNT
d. In joules, watt-hours or multiples, the total: i. electricity sold ii. heating sold iii. cooling sold iv. steam sold.	QNT
e. Total energy consumption within the organization, in joules or multiples.	QNT
f. Standards, methodologies, assumptions, and/or calculation tools.	QLT
g. Source of the conversion factors used.	QLT
302:4 Reduction of energy consumption	
a. Amount of reductions in energy consumption achieved as a direct result of conservation and efficiency initiatives, in joules or multiples	QNT
b. Types of energy included in the reductions; whether fuel, electricity, heating, cooling, steam, or all.	QLT
c. The basis for calculating reductions in energy consumption, such as base year or baseline, including the rationale for choosing it.	QNT*
d. Standards, methodologies, assumptions, and calculation tools used	QLT
Standard GRI: 303 Water	
303-1 Interactions with water as a shared resource	
a. A description of how the organization interacts with water, including how and where water is withdrawn, consumed, and discharged, and the water-related impacts caused or contributed to, or directly linked to the organization's activities, products or services by a business relationship (e.g., impacts caused by runoff).	QLT
b. A description of the approach used to identify water-related impacts, including the scope of assessments, their timeframe, and any tools or methodologies used	QLT
c. A description of how water-related impacts are addressed, including how the organization works with stakeholders to steward water as a shared resource, and how it engages with suppliers or customers with significant water-related impacts.	QLT
d. An explanation of the process for setting any water-related goals and targets that are part of the organization's management approach, and how they relate to public policy and the local context of each area with water stress.	QLT
303-3 Water withdrawal	
a. Total water withdrawal from all areas in megaliters, and a breakdown of this total by the following sources, if applicable: i. Surface water; ii. Groundwater; iii. Seawater; iv. Produced water; v. Third-party water	QNT
b. Total water withdrawal from all areas with water stress in megaliters, and a breakdown of this total by the following sources, if applicable: i. Surface water; ii. Groundwater; iii. Seawater; iv. Produced water; v. Third-party water, and a breakdown of this total by the withdrawal sources listed in i-iv.	QNT
c. A breakdown of total water withdrawal from each of the sources listed in Disclosures 303-3-a and 303-3-b in megaliters by the following categories: i. Freshwater ($\leq 1,000$ mg/L Total Dissolved Solids); ii. Other water	QNT
d. Any contextual information necessary to understand how the data have been compiled, such as any standards, methodologies, and assumptions used.	QLT
Standard GRI: 305 Emissions	
305-1: Direct (Scope 1) GHG emissions	
a. Gross direct (Scope 1) GHG emissions in metric tons of CO2 equivalent.	QNT
b. Gases included in the calculation; whether CO2, CH4, N2O, HFCs, PFCs, SF6, NF3, or all.	QLT
c. Biogenic CO2 emissions in metric tons of CO2 equivalent.	QNT
d. The base year for the calculation, if applicable, including i. the rationale for choosing it; ii. Emissions in the base year; iii. the context for any significant changes in emissions that triggered recalculations of base year emissions.	QNT*
e. Source of the emission factors and the global warming potential (GWP) rates used, or a reference to the GWP source.	QLT
f. Consolidation approach for emissions; whether equity share, financial control, or operational control.	QLT
g. Standards, methodologies, assumptions, and calculation tools used.	QLT
305-2 Energy Direct (Scope2) GHG emissions	
a. Gross location-based energy indirect (Scope 2) GHG emissions in metric tons of CO2 equivalent	QNT
b. If applicable, gross market-based energy indirect (Scope 2) GHG emissions in metric tons of CO2 equivalent.	QNT
c. If available, the gases included in the calc.; whether CO2, CH4, N2O, HFCs, PFCs, SF6, NF3, or all.	QLT
d. The base year for the calculation, if applicable, including i. the rationale for choosing it; ii. Emissions in the base year; iii. The context for any significant changes in emissions that triggered recalculations of base year emissions.	QNT*
e. Source of the emission factors and the global warming potential (GWP) rates used, or a reference to the GWP source.	QLT
f. Consolidation approach for emissions; whether equity share, financial control, or operational control.	QLT
g. Standards, methodologies, assumptions, and calculation tools used.	QLT
305-3 Other Indirect (Scope 3) GHG emissions	
a. Gross other indirect (Scope 3) GHG emissions in metric tons of CO2 equivalent.	QNT
b. If available, the gases included in the calc.; whether CO2, CH4, N2O, HFCs, PFCs, SF6, NF3, or all.	QLT
c. Biogenic CO2 emissions in metric tons of CO2 equivalent.	QNT
d. Other indirect (Scope 3) GHG emissions categories and activities included in the calculation.	QLT
e. The base year for the calculation, if applicable, including i. the rationale for choosing it; ii. Emissions in the base year; iii. The context for any significant changes in emissions that triggered recalculations of base year emissions.	QNT*
f. Source of the emission factors and the global warming potential (GWP) rates used, or a reference to the GWP source	QLT
g. Standards, methodologies, assumptions, and calculation tools used.	QLT

⁶² <https://www.globalreporting.org/standards/gri-standards-download-center/>

305-5 Reduction of GHG emissions		
a.	GHG emissions reduced as a direct result of reduction initiatives, in metric tons of CO2 equivalent.	QNT
b.	Gases included in the calculation; whether CO2, CH4, N2O, HFCs, PFCs, SF6, NF3, or all.	QLT
c.	Base year or baseline, including the rationale for choosing it.	QNT*
d.	Scopes in which reductions took place; whether direct (Scope 1), energy indirect (Scope 2), and other indirect (Scope 3).	QLT
e.	Standards, methodologies, assumptions, and calculation tools used.	QLT
Standard GRI 306: Effluents and Waste		
GRI 306-1: Water discharge by quality and destination		
a.	Total volume of planned and unplanned water discharges by: i. destination; ii. quality of the water, including treatment method; iii. whether the water was reused by another organization.	QNT
b.	Standards, methodologies, and assumptions used	QLT
306-2 Waste by type and disposal method		
a.	Total weight of hazardous waste, with a breakdown by the following disposal methods where applicable: i. Reuse, ii. Recycling, iii. Composting, iv. Recovery, including energy recovery v. Incineration (mass burn), vi. Deep well injection, vii. Landfill, viii. On-site storage, ix. Other (to be specified by the organization).	QNT
b.	Total weight of non-hazardous waste, with a breakdown by the following disposal methods where applicable: i. Reuse, ii. Recycling, iii. Composting, iv. Recovery, including energy recovery v. Incineration (mass burn), vi. Deep well injection, vii. Landfill, viii. On-site storage, ix. Other (to be specified by the organization).	QNT
c.	How the waste disposal method has been determined: i. Disposed of directly by the organization, or otherwise directly confirmed ii. Information provided by the waste disposal contractor iii. Organizational defaults of the waste disposal contractor	QLT
Standard GRI 307-1: Environmental Compliance		
a.	Significant fines and non-monetary sanctions for non-compliance with environmental laws and/or regulations in terms of: i. Total monetary value of significant fines; ii. total number of non-monetary sanctions; iii. cases brought through dispute resolution mechanisms.	QLT
b.	If the organization has not identified any non-compliance with environmental laws and/or regulations, a brief statement of this fact is sufficient.	QLT
Standard GRI 308: Supplier Environmental Assessment		
GRI 308-1 New suppliers that were screened using environmental criteria		
a.	Percentage of new suppliers that were screened using environmental criteria.	QNT
308-2 Negative environmental impacts in the supply chain and actions taken		
a.	Number of suppliers assessed for environmental impacts.	QNT
b.	Number of suppliers identified as having significant actual and potential negative environmental impacts	QNT
c.	Significant actual and potential negative environmental impacts identified in the supply chain	QLT
d.	Percentage of suppliers identified as having significant actual and potential negative environmental impacts with which improvements were agreed upon as a result of assessment.	QNT*
e.	Percentage of suppliers identified as having significant actual and potential negative environmental impacts with which relationships were terminated as a result of assessment, and why.	QNT

Data analysis: Specific Material Topics

Table 2. Indications according to quality and quantity levels of Qnt vs Qlt SI (Coding scheme)

GRI 302; Energy	ACER					ASUS				
	L0	L1	L2	L3		L0	L1	L2	L3	
GRI 302-4										
302-4a				x						x
302-4b				x						x
302-4c			x					x		
302-4d			x					x		
Score	10					10				
GRI 302-1										
302-1a				x						x
302-1b				x		x				
302-1c				x						x
302-1d	x					x				
302-1e	x					x				
302-1f			x					x		
302-1g	x							x		
Score	11					10				
Total score	21					20				
GRI 303; Water										
GRI 303-1										
303-1a			x					x		
303-1b	x						x			
303-1c		x					x			
303-1d		x					x			
303-3a		x					x			
303-3b		x					x			
303-3c	x					x				
303-3d			x					x		
Total score	8					9				

GRI 305; Emissions										
GRI 305-1										
305-1a				x					x	
305-1b			x					x		
305-1c			x					x		
305-1d		x					x			
305-1e		x						x		
305-1f			x					x		
305-1g			x					x		
Score	13					14				
305-2a				x					x	
305-2b				x				x		
305-2c			x					x		
305-2d			x					x		
305-2e		x						x		
305-2f			x					x		
305-2g			x					x		
Score	15					15				
305-3a			x				x			
305-3b			x				x			
305-3c			x				x			
305-3d		x					x			
305-3e		x					x			
305-3f			x				x			
305-3g			x				x			
Score	12					0				
305-5a				x					x	
305-5b			x					x		
305-5c			x					x		
305-5d			x					x		
305-5e			x					x		
Score	11					11				
Total score	51					40				
GRI 306; Effluents and Waste										
GRI 306-1										
306-1a	x						x			
306-1b	x						x			
306-2a				x					x	
306-2b				x					x	
306-2c			x					x		
Score	8					8				
GRI 307; Environmental Compliance										
GRI 307-1										
307-1a			x					x		
307-1b			x					x		
Total score	4					4				
GRI 301; Materials										
GRI 301-1										
301-3a		x					x			
301-3b		x					x			
Total score	2					2				
GRI 308; Supplier Environmental Assessment										
GRI 308-1										
308-1a	x						x			
Score	0					0				
GRI 308-2										
308-2a				x			x			
308-2b				x			x			
308-2c			x				x			
308-2d			x				x			
308-2e	x						x			
Score	10					0				
Total score	10					0				
Total Overall Score for Ls	104					83				
Total no. of sub indicators per each L	9	11	27	13	60	19	8	24	9	60

Table 3. Indications according to the quality and quantity score of Indicators and Sub indicators (Coding scheme)

Indicators	ACER			ASUS		
	Individual Score	Max Score	Threshold Score	Individual Score	Max Score	Threshold Score
GRI 301: MATERIALS						
GRI 301-3						
301-3a QNT	1	3		1	3	
301-3b QLT	1	3		1	3	
SCORE	2(-)	6	3	2(-)	6	3
Total Nr. of Indicators beyond CO	+0 indicators			+0 indicators		
GRI 302: ENERGY						
GRI 302-4						
302-4a QNT	3	3		3	3	
302-4b QLT	3	3		3	3	
302-4c QLT	2	3		2	3	
302-4d QLT	2	3		2	3	
SCORE	10(+)	12	6	10(+)	12	6
GRI 302-1						
302-1a QNT	3	3		3	3	
302-1b QNT	3	3		0	3	
302-1c QNT	3	3		3	3	
302-1d QNT	0	3		0	3	
302-1e QNT	0	3		0	3	
302-1f QLT	2	3		2	3	
302-1g QLT	0	3		2	3	
SCORE	11(+)	21	10.5	10(-)	21	10.5
TOTAL QUALITY SCORE	21(+)	33	16.5	20(+)	33	16.5
Total Nr. of indicators beyond CO	+1 indicator			+1 indicator		
GRI 303: WATER						
GRI 303-1						
303-1a QLT	2	3		2	3	
303-1b QLT	0	3		1	3	
303-1c QLT	1	3		1	3	
303-1d QLT	1	3		1	3	
Score	4	12	6	5	12	6
GRI 303-3						
303-3a QNT	1	3		1	3	
303-3b QNT	1	3		1	3	
303-3c QNT	0	3		0	3	
303-3d QLT	2	3		2	3	
Score	4	12		4	12	
TOTAL QUALITY SCORE	9(-)	27	12	10(-)	27	12
Total Nr. of indicators beyond CO	+1 indicator			+1 indicators		
GRI 305: EMISSIONS						
GRI 305-1						
305-1a QNT	3	3		3	3	
305-1b QNT	2	3		2	3	
305-1c QNT	2	3		2	3	
305-1d QNT	1	3		1	3	
305-1e QLT	1	3		2	3	
305-1f QLT	2	3		2	3	
305-1g QLT	2	3		2	3	
Score	13(+)	21	10.5	14(+)	21	10.5
GRI 305-2						
305-2a QNT	3	3		3	3	
305-2b QNT	3	3		2	3	
305-2c QLT	2	3		2	3	
305-2d QNT	2	3		2	3	
305-2e QLT	1	3		2	3	
305-2f QLT	2	3		2	3	
305-2g QLT	2	3		2	3	
Score	15(+)	21	10.5	15(+)	21	10.5
GRI 305-3						
305-3a QNT	2	3		0	3	
305-3b QLT	2	3		0	3	
305-3c QNT	2	3		0	3	
305-3d QLT	1	3		0	3	
305-3e QNT	1	3		0	3	
305-3f QLT	2	3		0	3	

305-3g QLT	2	3		0	3	
Score	12(+)	21	10.5	0(-)	21	10.5
GRI 305-5						
305-5a QNT	3	3		3	3	
305-5b QLT	2	3		2	3	
305-5c QNT	2	3		2	3	
305-5d QLT	2	3		2	3	
305-5e QLT	2	3		2	3	
Score	11(+)	15	7.5	11(+)	15	7.5
TOTAL QUALITY SCORE	51(+)	102	51	40(-)	102	51
Total Nr. of indicators beyond CO	+ 3 indicators			+3 indicators		
GRI 306: EFFLUENTS AND WASTE						
GRI 306-1						
306-1a QNT	0	3		0	3	
306-1b QLT	0	3		0	3	
Score	0(-)	6	3	0(-)	6	3
GRI 306-2						
306-2a QNT	3	3		3	3	
306-2b QNT	3	3		3	3	
306-2c QLT	2	3		2	3	
Score	8(+)	9	4.5	8(+)	9	4.5
TOTAL QUALITY SCORE	8(+)	15	7.5	8(+)	15	7.5
Total Nr. of indicators beyond CO	+1 indicator			+1 indicator		
GRI 307: ENVIRONMENTAL COMPLIANCE						
GRI 307-1						
307-1a QLT	2	3		2	3	
307-1b QLT	2	3		2	3	
TOTAL QUALITY SCORE	4(+)	6	3	4(+)	6	3
Total Nr. of indicators beyond CO	+0 indicators			+0 indicators		
GRI 308: SUPPLIER ENVIRONMENTAL ASSESSMENT						
GRI 308						
308-1a QNT	0	3		0	3	
308-2a QNT	3	3		0	3	
308-2b QNT	3	3		0	3	
308-2c QLT	2	3		0	3	
308-2d QNT	2	3		0	3	
308-2e QNT	0	3		0	3	
TOTAL QUALITY SCORE	10	18	9	0	18	9
TOTAL NR. OF IND. BEYOND CO	0			0		
TOTAL OVERALL QUALITY SCORE	104(+) 57.7%	180	90	83(+) 46.1%	180	90
TOTAL NR. OF SUB INDICATORS REPORT ON	51 SI	60-REPORTED ON 85% OF POSSIBLE SI ⁶³	30-REPORTED ON 160% SI ABOVE THE THRESHOLD SCORE ⁶⁴	41 SI	60 REPORTED ON 68% OF POSSIBLE SI	30 REPORTED ON 136% SI ABOVE THE THRESHOLD SCORE
TOTAL NR. OF INDICATORS BEYOND CORE OPTION	+6 Indicators Minimum nr of Ind. according. To the GRI CO; 7. 85% more Ind. reported then obliged ⁶⁵			+5 Indicators Minimum nr. of Ind. according to the GRI CO; 7. 71% more Ind. reported then obliged		

⁶³ 100 / 60 = 1.66, 1.66 X 51 = 85

⁶⁴ 100 / 30 = 3.33, 3.33 X 51 = 160

⁶⁵ 100 / 7 = 14.28, 14.28 X 6 = 85