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Improving the sustainability strategies and performances in the private sector

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Colophon

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Summary

The private sector has the role and responsibility to be sustainable and contribute to achieving global goals such as the Sustainable Development Goals (SDGs) and Paris Agreement. Transparency of companies' sustainability is needed to see if they are actually contributing towards these global goals. In order to understand that the private sector is acting responsible and sustainable, the organization publishes reporting and sustainable information. However, questions arise whether companies are actually acting sustainably and how sustainable they are. Sustainability strategy and performance play a significant role in implementing sustainability.

This research aims to evaluate companies' sustainable strategies and performance to see how companies' strategy influence their performance to contribute to the SDGs. In addition, this study gained insights into practical perspectives to influence their organization to become more sustainable and see the relationship on how to improve the company performance to achieve the global targets such as the SDGs and Paris Agreement. The focus of the study will evaluate two electrical equipment companies named Schneider Electric S.E and Signify N.V, which both companies believe in contributing to the SDGs.

The central question in this research is *"How do the sustainability strategy of Schneider Electric and Signify influence and improve their sustainability performance?"*

In the results, Signify and Schneider have shown to make a strong commitment to sustainability in its operations that align with the Paris Agreement target and Sustainable Development Goals. Standards and regulations have influenced companies in considering their sustainability activity, including the sustainability strategy. Standards and regulations have played a significant influence on the strategy and performance of companies. Although the standards that are used between the companies are the same, the execution and sustainability strategies applied are different. Hence, standards have been shown to help and advise what sustainability implementation should be considered, but the sustainability activity depends on the company. In addition to sustainability strategy and performance, organizations must take ambitious and valuable applications within the sustainability activities to encourage exemplary implementation and development. Hence, an ambitious sustainability strategy and target will influence the sustainability performance and outcome.

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1 Introduction

The Paris Agreement has set a universal goal to limit temperature rise below 2°C, which aims to tackle the impact of climate change (UNFCCC, 2021). With the set target, the public and private actors' actions are needed towards climate change. The Intergovernmental Panel on Climate Change (IPCC) illustrates a global temperature projection, as shown in **Figure 1**. Human activities are estimated to lead to 1.0°C of global warming, and if the current rate continues to increase, it is likely to reach 1.5°C between 2030 and 2052 (IPCC, 2018). The pathway to limit temperature rise to 1.5°C will require a transformative action in adaptation and mitigation investments, policy instruments, technological innovation, and behavioral changes (IPCC, 2018).

Cumulative emissions of CO₂ and future non-CO₂ radiative forcing determine the probability of limiting warming to 1.5°C

a) Observed global temperature change and modeled responses to stylized anthropogenic emission and forcing pathways

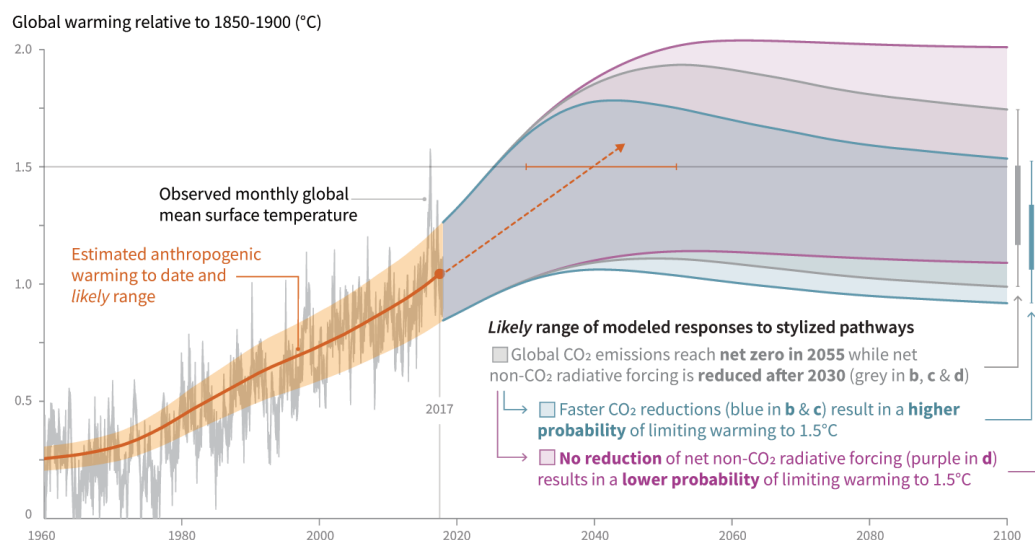


Figure 1 Global temperature pathways

Source: (IPCC, 2018, p.8)

Sustainable development

Sustainable development supports the fundamental societal and systems transitions and transformation (IPCC, 2018). In contemporary debate, sustainability is often associated or synonymous with sustainable development (Meadowcroft, 2021). However, sustainability as a concept term still lacks a working consensus (Garza, 2013). The understanding of sustainable development and sustainability varies, where the most commonly accepted definition comes from the Brundtland Report in 1987 (Siew, 2015). According to the Brundtland Report (1987), global sustainability is the development to meet the needs of the present without compromising the needs of future generations. In that sense, the idea of sustainability relates to environmental and socio-economic issues (Hopwood et al., 2005). Likewise, sustainability

is a multidisciplinary concept covering different life aspects (Sadollah, Nasir, & Geem, 2020). Sustainability is the ability of humans to continue to live within environmental constraints (Robinson, 2004). Sustainability also implies an interrogation of social organizations to determine their implementation as well as a conscious effort to transform the status quo and drive the development of more sustainable activities. (Meadowcroft, 2021). Hence, sustainability can represent an expectation for developments in social and environmental performance. Sustainable development is the result of growing awareness of the global environmental problems, socio-economic issues with poverty and inequality, and concerns about a healthy future for humanity (Hopwood et al., 2005). Sustainable development can also refer to a process to achieve human development in an inclusive, connected, equitable, prudent, and secure manner (Hart & Milstein, 2003). Hence, the sustainability development concept is to bridge the gap between environmental consequences of human activities and human development issues (Robinson, 2004).

Sustainable Development Goals (SDGs) are the blueprint for achieving a more sustainable future for all (UN, 2021). The United Nations (UN) adopted 17 Sustainable Development Goals and 169 target indicators that are planned to achieve by 2030. The SDGs signal a paradigm shift in areas of critical importance for humanity and the planet. Achieving the global goal and targets requires all sectors to play an essential role in taking action for sustainable development (UN, 2015). Business, government, and civil society are equally responsible for advancing a more sustainable path (Scheyvens, Banks, & Hughes, 2016). Indeed, all sector plays an essential role towards sustainable development by embracing the practice of sustainability. For example, the action of high carbon emission reduction is necessary to result in a higher probability of limiting global warming to 1.5°C and contribute to the SDGs.

Roles

The practical challenge of sustainability is to find specific ways to overtake the goals that conform to their mutual relation (Jenkins, 2010). Achieving the global goals requires the role of the government, civil society, and business actors to take action. As claimed in SDG 17, achieving a successful sustainable development agenda requires partnerships between governments, the private sector, and civil society (Mugo, Visseren-Hamakers, & Duim, 2020). The government is considered capable of acting and taking responsibility for choices and policies (Löwenheim, 2008). The governmental authorities provoke citizens to act in a particular way that affects how individuals perceive their security, which normalizes individuals into taking responsibility for their actions (Innes & Steele, 2012). Although the private sector has limited access to influence the regulatory process directly, the private sector has more freedom to develop innovative practices (Lieverink, Veenman, & Wiering, 2013). Thus, the private sector directly regulates its behavior.

Nevertheless, transformative global aim causes cities and companies to reflect on establishing carbon neutrality targets and zero-carbon solutions. In particular, the roles of the private

sector can shape social trends, including the growth of material consumption that can shape market demands and environmental impacts of consumption (Michaelis, 2003). To have an effective and transformative manner in supporting the global goals, businesses must play to its strength (Business Fights Poverty and CSR Initiative at Harvard, 2015). The SDGs are important for business as it brings benefits, including the use of a common language and shared purpose, identifying future business opportunities, gaining value of corporate sustainability, strengthening relations with stakeholders and making progress with policy developments, and stabilizing societies and markets (GRI, UN Global Impact, WBCSD, 2015). Specifically, corporate sustainability is defined as corporations' contribution to the broader sustainability agenda, which relates to reforming corporate governance, encouraging corporate responsibility, and designing alternatives (Meadowcroft, 2021).

Sustainable future

The approach to a sustainable future that is applied still varies, ranging from a moderate "greening" of social institutions to a radical transformation of global political and economic order (Meadowcroft, 2021). Yanarella, Levine, & Lancaster (2009) criticize that the sustainability approach can be distinguished by the terms green and sustainability. Many are trying to prove their organization is acting responsibly and has a sustainable approach within the private sector. For instance, the practice of sustainability in private sectors potentially will shift to implement their commitments in decarbonization (The World Bank, 2015). Also, over 1,000 companies have pledged to set emission reduction targets across their operations and value chains (Science Based Targets, 2021). Reducing carbon emissions is one of the ways companies involve sustainability practice by internal and external processes that comply with related regulations to help support the global target.

In addition, many companies want to do the positive thing for all their stakeholders, and many stakeholders want to support them in being responsible (Summers, 2019). Awareness of the private sector's role in facing climate challenges and contributing to sustainable development seems to be increasing (Alkhani, 2020). To assess how companies are actually contributing towards the SDGs, companies need transparency on their impact (Bracco, 2021). Companies starting to realize the future landscape must bring attention to sustainability strategies and disclose environmental, social, and governance information (Alsayegh, Rahman, & Hodayoun, 2020). Industries address this by developing reporting and publishing the company's information in accordance with global standards and local regulations.

An increasing number of companies are voluntarily integrating social and environmental policies into their business model and operations, reporting their environment and social performance within their financial performance disclosure (Serafeim, 2014). Many companies provide reporting to disclose their sustainability information through sustainability reporting or integrated reporting. The reporting undertakes as voluntary reporting but is known to offer a high value to the business and society, thus making companies willing to create these

reports. On the other hand, there are various approaches or guidelines that can be used to assist companies in structuring the report, as there is not a single and uniform mandatory guideline to follow. Therefore, the approach and methodology of every company can be different.

1.1 Research problem statement

The increased focus on sustainability has been a turning point for the private sector to be more involved, but a more contextual understanding is needed (Alkhani, 2020). According to Data Driven Yale (2018), there is an urgent need to operationalize the full range of climate commitments and need more ambitious commitments from all stakeholders to achieve the global goals. Companies are working with the SDGs, but the implementation through dedicated SDGs has been slow (Lisowski et al., 2020). Hence, there needs to be transformative change to support the optimization of achieving global goals. Sustainable reporting helps businesses to set goals, assess success, and implement progress to make them more sustainable (Oprean-Stan, Oncioiu, Iuga, & Stan, 2020). The reporting provides transparency of the company's strategy and target. Companies reporting of sustainability reporting or integrated reporting can be published yearly. However, the question that arises is whether the sustainability disclosure in reporting indicates actual sustainability performances. There are perceptions that companies use these reports mainly to influence stakeholder perceptions without putting much effort into sustainability, which can lead to greenwashing (Papoutsis & Sodhi, 2020). Some companies perceived communication of responsible activities results in improving their image and focus economic benefit (Landrum & Ohsowski, 2018). With this view, companies' sustainability reports may not indicate their actual sustainability performance (Herbohn, 2014). Hence, an evaluation will be conducted to view how sustainable the company is and explore the influence of sustainability strategy and performance.

1.2 Research aim and research questions

The aim of the research is to evaluate companies' sustainability activity and performance to see how companies contribute to the SDGs. In this research, the term sustainability activity refers to the application of sustainability strategies and targets, sustainable value, and sustainability transparency and reporting. This can help develop insight into the private sector's practical perspectives to influence their organization to become more sustainable and see the relationship on how to improve the company performance to achieve the global targets such as the SDGs and Paris Agreement. The focus of the study evaluates two electrical equipment companies named Schneider Electric S.E and Signify N.V. The demand for electrical equipment is expected to increase rapidly over several years based on various factors, including greater housing needs of a larger population and the continued growth in the use

of electrical appliances (Sutliff, 1966). With rapid development demands, new electrical equipment is becoming a necessity (Millson & Wilemon, 2006). It is valuable to acknowledge the development of the industry in integrating sustainability concepts as it supports access to energy distribution and innovative solutions in improving energy and resource efficiency (S&P Global, 2021a). This research focuses on these companies because both companies have established their sustainability efforts and regularly issue reports on their sustainability. Also, both are among the top in the electrical industries listed in Dow Jones Sustainability Indices, which are markets that show their significant roles in the global industries. In addition, it will provide an actual view of the company's purpose to balance the profit-oriented and its concerns to the environment and society. For a comprehensive explanation, the research will answer the following main question and sub-questions.

The main research question is:

“How do the sustainability strategy of Schneider Electric and Signify influence and improve their sustainability performance?”

The main research question will be answered with the help of the following sub-questions:

1. Do the companies align with the sustainability standards and what sustainability standards influence the action to implement sustainability?
2. Do the sustainability activities implemented by the companies exhibit the sustainability benefits that it is claimed to have?
3. What challenges exist in sustainability performance and how can they be improved?
4. What is the current staging of the companies' sustainability implementation?

1.3 Scientific and societal relevance

The scientific case for sustainability is based on the fact that human impacts lead to environmental degradation, climate change, loss of biodiversity, and changes in the biosphere (Landrum, 2018). The issue of sustainable development in the private sector gained attention among scholars over the past few decades associated with improper business conduct, societal and environmental problems (Alsayegh, Rahman, & Homayoun, 2020). Sustainability strategy and performance impact assessment attract importance within this research stream (Goyal, Rahman, & Kazmi, 2013). The scientific relevance of this research contributes to academic knowledge to see if companies are acting in a sustainable way and contributing to achieving the SDGs. In addition, to understand the interpretation of sustainability within companies. Hence, support examining human behavior to better address environmental issues and help identify opportunities for change. This research takes into account the practical level that focuses on the electrical equipment and component industries. The private sector's role in achieving the SDGs and sustainable development is defined by organizations' ability to be drivers of change (Valdivieso, 2020). Furthermore, the Paris agreement is legally binding, which requires all stakeholders to participate, including private companies.

Sustainability development needs interdisciplinary aspects of the environment, economic, and social, where practices need to consider all these three aspects. These aspects raise attention that will accelerate the process decision-making of private sectors. As the global target is set to be achieved in 2030, this research enables to provide information on how companies progress and condition at a practical level. In addition, studies on the electrical and equipment industry are still limited, so this research can support knowing more about the industry as a study case.

The societal relevance of this research contributes to the solution of real-life issues as private sectors have efforts to consider the global condition and challenges to meet the SDGs. The traditional view of companies maximizing the financial return to stakeholders has changed. Stakeholders increasingly demand more disclosure not only on economic but also environmental and social practices (Siew, 2015). Private sectors have the ability to help and support protecting the environment and contributing to society within their business, such as creating local projects and involving the participation of women in the workplace. This research can gain insights into the efforts that are being built to contribute to sustainability. Since sustainability in private sectors has both internal and external impacts, this allows seeing the interactions taking place in society and the environment. The study can provide an evaluation of the industry's support and contribution in carrying out its current and future sustainability approach.

1.4 Thesis outline

This research is initially structured by discussing the condition of global sustainability and the context of the research. Chapter two presents an overview of the theoretical framework. This chapter focuses on the relevant theories of transparency in environmental governance, sustainability spectrum, sustainability reporting, sustainable strategies and targets, and ESG ratings. Then in chapter three, the methodological approach and operationalization of the research are explained. The fourth chapter elaborates on the findings and results of the research. The following chapter is the conclusion and discussion of the main research questions. In addition, the recommendation for further research and limitations are discussed at the end of the section. References and appendix will be included in the last chapter.

2 Theoretical framework

2.1 Transparency in sustainability governance

Transparency is assumed to provide information disclosure that helps stakeholders understand the organizations and how they are presented (Strathern, 2000). In the area of global sustainability, diverse forms of openness and information disclosure are increasingly demanded to make visible sources of environmental harm by both public and private actors (Gupta et al., 2020). Increased transparency presents public and private efforts to manage environmental challenges across various issues, including hazardous substances and global climate change (Gupta, 2008). Both the public and private actors enfold transparency as necessary for decision-making and regulatory action to address transboundary environmental concerns (Gupta & Mason, 2014). However, there is a critical debate that transparency contains political and normative conflict rather than being neutral. The critical transparency studies perspective emphasizes that transparency includes the design of transparency systems and the normative and political contexts in which the system is applied, which is key to assessing why transparency recognizes its transformative potential in global sustainability governance (Gupta, 2008). From the critical perspective, that transparency arrangements become implicated where public and private actors may be exempt from severe forms of mandatory disclosure that could generate a reduction in harmful environmental practices (Knox-Hayes & Levy, 2014).

Gupta et al. (2020) has identified cross-sectional themes to analyze transparency and sustainability in environmental governance, including typologies of transparency, commodity chain transparency, and digitalized forms of radical transparency. Typology of transparency highlights elements relating to who is to be transparent, to whom, about what, and to what end. This helps to illustrate the broader political and normative context. Commodity chain transparency refers to the transparency and traceability of products, goods, and service within the complex supply chain. Traceability refers to the structured transfer of information in the value chain to address issues of sustainability products and production practices. Transparency as digitalized radical visibility introduces technologies that can generate visibility of public and private activities and their sustainability effects. These cross-sectional themes can demonstrate the interlinkages between transparency, accountability, and empowerment in environmental governance and the increasing need to examine the performative effects of transparency.

2.2 Sustainability spectrum

Discussion of sustainability within academia has ranged across many perspectives (Meadowcroft, 2021). Sustainability achieved international public prominence through the Brundtland Report in 1987 (Jenkins, 2010). The term sustainable development in the World Conservation Strategy is expressed in the Brundtland report as meeting the present needs without compromising the needs of the upcoming generations (IUCN et al., 1980). Another

perspective of sustainability by an economic analyst is the concept of sustainability as long-term economic growth with minimal environmental impacts and sustains the income flows (Meadowcroft, 2021). In contrast, ecologist theorists define sustainability in terms of biological diversity and ecological integrity (Jenkins, 2010). In addition, political analysts focus on the ideological and normative implications of sustainability (Meadowcroft, 2021). Since there are a variety of interpretations of the meaning of sustainability, it is helpful to identify based on the ideologies or worldviews (Landrum, 2018). O’Riordan (1989) identified four worldviews on environmentalists, but Pearce and Turner (1990) note that O’Riordan’s (1989) ideology was crystallized by the subdiscipline of environmental economics. The controversy of human-made capital and nature has divided proponents of weak and strong sustainability (Meadowcroft, 2021). Pearce (1993) notes that the four worldviews of sustainable development literature position as weak and strong sustainability.

Identifying weak and strong sustainability represents the worldviews on the interaction between economy, environment, and people. The different views distinguish between sustainable and unsustainable actions by their approach to integrating the vision of change, innovation, and collaboration (Landrum, 2018). Weak sustainability is defined as accepting natural resource depletion with adequate compensation, while strong sustainability requires preserving the environment (Beckerman, 1994). The two views of weak sustainability and strong sustainability correspond to ecologically centered position (ecocentric) and human-centered position (anthropocentric) in environmental ethics (Jenkins, 2010). Ecocentric views take into account the ecological integrity for its own account, while anthropocentric argue that human systems depend on rich biodiversity.

The classification of sustainability is defined as technocentric and ecocentric (Landrum, 2018). Technocentric refers to the weak and very weak sustainability based on neoclassical economic principles that are intact for production and consumption. Weak sustainability views manufacturing or human-made capital can be a substitute for nature capital. Very weak sustainability refers to the limitless human capacity to exploit the environment to serve human purposes. In contrast, ecocentric indicates strong and very strong sustainability based on ecological economics physical principles and recognizes that environmental boundaries limit economic activity. Strong sustainability appoints manufactured resources that cannot substitute for natural resources. Hence, natural resources must be preserved and not rapidly replaced. Very strong sustainability views humans as an integral part of nature and realizes humans must harmonize with the natural world. In addition, it advances that natural capital cannot be monetized, believes change is required in economic systems and consumption, and encourage ethical dimensions.

	Technocentrism		Eccentrism	
	Very weak sustainability (intervention; extreme cornucopian)	Weak sustainability (accommodation; accommodating)	Strong sustainability (communalism; communitist)	Very strong sustainability (gaianism; deep ecology)
Green labels	Resource exploitative, growth orientated position	Resource conservationist and "managerial" position	Resource preservationist position	Extreme preservationist position
Type of economy	Anti-green economy, unfettered free markets	Green economy, green markets guided by economic incentive instruments	Deep green economy, steady-state economy regulated by macro-environmental standards and supplemented by EIs because of physical and social limits Decentralized socioeconomic system is necessary	Very deep green economy, heavily regulated to minimize "resource-take"; socioeconomic system (e.g., based on organic agriculture and deindustrialization)
Management strategies	Primary economic policy objective, maximize economic growth (GDP) Taken as axiomatic that unfettered free markets in conjunction with technical progress will ensure infinite substitution possibilities capable of mitigating all "scarcity/limits" constraints (environmental sources and sinks)	Modified economic growth (GDP) Decoupling important but infinite substitution rejected. Sustainability rules: constant capital rule Sustainable growth is a practicable option as long as certain resource management rules (e.g., for renewable resource sustainable yield management) are followed	Zero economic growth, zero population growth Decoupling plus no increase in scale. "Systems" perspective—"health" of whole ecosystems very important; Gaia hypothesis and implications Emphasis on small scale and community identity	Reduced scale of economy and population Scale reduction imperative; at the extreme for some there is a literal interpretation of Gaia as a personalized agent to which moral obligations are owed
Ethics	Support for traditional ethical reasoning, rights and interests of contemporary individual humans, instrumental value (i.e., of recognized value to humans) in nature	Extension of ethical reasoning: "caring for others" motive— intragenerational and intergenerational equity (i.e., contemporary poor and future people); instrumental value in nature	Further extension of ethical reasoning: interests of the collective take precedence over those of the individual, primary value of ecosystems and secondary value of component functions and services	Acceptance of bioethics (i.e., moral rights/ interests conferred on all nonhuman species and even the abiotic parts of the environment), intrinsic value in nature (i.e., valuable in its own right regardless of human experience)
Source of change	Faith in the application of science, market forces, and managerial ingenuity	Faith in the adaptability of institutions and approaches to assessment and evaluation to accommodate to environmental demands	Faith in the cooperative capabilities of societies to establish self-reliant communities based on renewable resource use and appropriate technologies	Faith in the rights of nature and of the essential need for coevolution of human and natural ethics
Identity	Business and finance managers, skilled workers, self-employed, right-wing politicians, career-focused youth, control political and economic power in all countries	Middle-ranking executive, environmental scientists, white-collar trade unions, liberal-socialist politicians	Radical socialists, committed youth, radical-liberal politicians, intellectual environmentalists	"Green" supporters, radical philosophers
Power	Belief in the retention of the status quo in the existing structure of political power, but a demand for more responsiveness and accountability in political, regulatory, planning, and educational institutions		Demand for redistribution of power toward a decentralized, federated economy with more emphasis on informal economic and social transactions and the pursuit of participatory justice	

Note. Adapted from O'Riordan (1989); Pearce (1993); Pearce and Turner (1990).

Figure 2 Sustainability spectrum
Source: (Landrum, 2018, p.293)

According to Landrum (2018) model of corporate sustainability, the sustainability spectrum is classified into five categories; compliance, business-centered, systemic, and coevolutionary. Compliance refers to very weak sustainability due to its defensive characteristic, and the sustainability activities are externally enforced and regulated, which can be considered business-as-usual. Business-centered holds a proactive stance by applying sustainability initiatives to increase strategic competitiveness. The business-centered sustainability is considered weak sustainability because this stage still focuses on growth and consumption and continues business-as-usual with incremental improvements. Systemic refers to the intermediate sustainability, which integrates environmental, social, and economic for improving humanity. Within this stage, the company continues to advocate an anthropocentric position to nature and business solutions by doing a more good perspective. Regenerative indicates strong sustainability that looks beyond growth and consumption, integrates environmental and ecological services, and repairs the damage of the industrial consumer economy. Since regenerative activity leans toward a restoring and conciliates nature orientation, it acknowledges the realities of carrying capacity and limits to growth. Coevolutionary sustainability prioritizes mutual relations and enhances the benefiting relationship of harmonizing an equal and contributing part of nature. This is a critical stage in achieving corporate sustainability and is considered very strong sustainability as it moves beyond repairing damage to adopting cooperation and symbiosis of consumption and use of resources.

	Compliance	Business-centered	Systemic	Regenerative	Coevolutionary
Sustainability spectrum position	Very weak	Weak	Intermediate	Strong	Very strong
Orientation	Economic science-oriented Business-oriented	Economic science-oriented Business-oriented	Economic science-oriented Business-oriented	Ecological science-oriented Ecology-oriented	Ecological science-oriented Ecology-oriented
Understanding of sustainability	Meet compliance requirements Internal firm-centric view	"Do less bad" Internal firm-centric view	"Do more good" Begins to look externally in defining sustainability Business is part of a larger industry and community working together toward systemic change	Repair damage to systems	Humans and all earth's beings are in a mutually enhancing and beneficial relationship
Relationship to natural world	To be managed and controlled; anthropocentric Resource exploitation	To be managed and controlled; anthropocentric Resource exploitation Eco-efficiency	To be managed and controlled; anthropocentric Resource exploitation Eco-efficiency	Part of the natural world Operate within planetary boundaries Manage and repair	Self-management as part of the natural world Participate in cooperative symbiotic relationship with the natural world
Economic growth	Pursuit of production, consumption, and growth	Pursuit of production, consumption, and growth	Pursuit of production, consumption, and growth	Qualitative development without production, consumption, and growth Steady-state growth	No growth in production or consumption Qualitative improvements
Sustainability concerns	Externally enforced or regulated activities Defensive actions with regard to economic, environmental, or social concerns	"Business case" is the motivation and measure of success Adoption and internal enforcement of activities Incremental improvements to business-as-usual May focus on one or more realms of sustainability (economic, environmental, social)	Integrates three realms of sustainability (economic, environmental, social) Work with other human systems	Integrates three realms of sustainability (economic, environmental, social) Work with human and non-human systems	Work in balance with other systems Contribute to flourishing of other systems

Figure 3 Sustainability stage
Source: (Landrum, 2018, p.304)

2.3 Sustainability reporting

Sustainability in a company represents a portfolio of environmental, social, and governance (ESG) considerations upon which company performance can be evaluated (Serafeim, 2014). ESG refers to three key factors in measuring the sustainability and ethical impact in a company (Fish, Kim, & Venkatraman, 2019). Sustainability reporting (SR) is known in various terms, including corporate social reporting (CSR), sustainable development reporting, triple bottom line reporting, non-financial reporting, and environmental social governance reporting (Siew, 2015). These reports are often used to disclose an organization's sustainability information. Sustainability report is a tool to understand the corporate worldviews on sustainability, which presents a company's economic, social, and environmental activities (Serafeim, 2016). The environmental criteria evaluate any environmental risks a company faces and manage, including energy use, waste, pollution, and natural resources. Social criteria refer to issues of inequality, the company's relationship with internal and external stakeholders, including society, labor relations, and human capital. Governance includes the assurances of the company avoiding conflict of interest and transparency of accounting methods, management structure, and employee relations.

Integrated reporting (IR) is also used to disclose an organization's information on financial, manufactured, intellectual, human, social and relationship, and natural (IIRC, 2021). The fundamental concept of integrated reporting lies within the value creation, capital, and business model. Both sustainability reporting and integrated reporting provide information about sustainability. However, the difference between integrated reporting and sustainability

reporting is that IR focuses on connecting and interdependence of the organization's ability to create value, which integrates non-financial and financial reporting in a holistic manner. With that, an integrated report can improve the qualitative information and increase transparency on the economic effects of the organization's ESG activities (Mervelskemper & Streit, 2017).

The first phase of sustainability reporting began in the 1970s when conventional financial reports were accompanied by social reports (Sepasi, Braendle, & Rahdari, 2019). In the 1980s, reports shifted focus to environmental issues such as emissions and waste pollution (Hahn & Kühnen, 2013). Within those periods, the formats of reports were diverse with no comparability. By the end of the 1990s, social and environmental dimensions were converged in sustainability reports (Hahn & Kühnen, 2013). Global Reporting Initiative provided a common ground for a sustainability reporting framework (Kuzey & Uyar, 2017). The development of the voluntary standard-setting by the Global Reporting Initiative linked to the trends of a joint report (Hahn & Kühnen, 2013). Sustainability reporting has become popular in the last decade due to the evolution of joint reports on environmental and corporate social responsibility (Kuzey & Uyar, 2017).

Global Reporting Initiative (GRI) Standards is a common language to report the sustainability impacts of organizations, enabling global comparability and organizations to be transparent and accountable (GRI, 2021). The standards provide guidance for the representation of an organization's impacts on the economy, environment, and society, which enhances transparency on the contribution towards sustainable development. These standards are continually updated. GRI standards consist of universal standards such as organization information and management approach. There are also topic-specific standards on economic, environmental, social that can be selected to report information for specific purposes.

In spite of standardization efforts, differentiation remains to be seen between companies with regard to content and quality of sustainability reports (Fortanier, 2011). Companies manage their own approach to disclose their indicators and sustainable information. In addition, the practice of sustainability reporting indicates that organizations can be faced with different issues and barriers (Zrnić, Starčević, & Crnković, 2020). Hence, the sustainability report provides the openness of companies presenting their sustainable strategies with their targets and performances. The sustainability report is often separately published from the annual financial report. In this research, sustainability reporting will help identify the company's strategies and performances that third parties have audited.

Sustainable standards and frameworks will be defined to acknowledge the sources used to disclose the company's sustainability performances. It has been proven that performance indicators are higher for companies with standards that support sustainability principles (Koroleva, Baggieri, & Nalwanga, 2020). There are different regulations that can be applied

with different specifications and purposes. As each company may use different frameworks in their reporting, it is necessary to identify the standards used to develop the reporting.

2.4 Sustainable strategies and targets

Sustainable strategy integrates sustainability aims and objectives of the organization to create a long-term value for society and stakeholders (Long, 2019). The sustainable strategies involve strategic management to allow organizations to capitalize on environmental opportunities and minimize threats (Rodrigues & Franco, 2019). Hence, the company strategy is produced and executed by meeting the company and stakeholder needs without compromising the natural resource needed in the future. Integrating sustainability into a business strategy can meet various stakeholders' expectations of companies' environmental, social, and governance implications (Lokuwaduge & Heenetigala, 2017). Therefore, sustainable strategies determine the business sustainability initiatives.

Strategic sustainability initiatives are categorized into three dimensions of environmental, social, and economic (Garza, 2013). An example of strategic environmental initiatives is waste reduction and improved compliance. The social category may include strategic initiatives such as human resources, external population, stakeholder participation. The economic category identifies programs measuring the interaction of stakeholders that contribute to financial goals such as net present value, delivery performance, and cost reduction.

A growing rate of businesses are aligning their strategies with the SDGs (GRI and UN Global Compact, 2019). The Global Reporting Initiative (GRI), along with World Business Council for Sustainable Development (WBCSD) and the UN Global Compact developed the SDG Compass. It is a guideline to help companies align their business strategies as well as to measure and manage their contribution to the SDGs (GRI, UN Global Impact, WBCSD, 2015). The approach supports meeting fundamental responsibilities in advancing ten principles in the area of anti-corruption, human rights, labor, and the environment.

Similarly, other guidelines and standards such as Task Force on Climate-related Financial Disclosures (TCFD) help guide companies to set strategies and targets that contribute to sustainability. TCFD recommendations are structured by four core areas of an organization: governance, strategy, risk management, and metrics and targets. Consulting firms have also developed their own tools to help companies understand how business strategy can support the SDGs (Betti, Consolandi, & Eccles, 2018). Likewise, there is also research on sustainable strategies frameworks, such as the research of Garza (2013).

A call to action of company commitments such as Science-based targets (SBTi) and Climate Pledge stimulates companies to set targets to lead the way to net-zero emissions. This relates to the company's commitment to achieving long-term targets. SBTi drives company climate

action to a clear-defined pathway in reducing greenhouse gas emissions. Targets are science-based when they are aligned with the latest climate science deems to meet the goals of the Paris Agreement. The Climate Pledge is a collective action of cross-sector companies and organizations that aims to build a safe and healthy planet for the future generation. It calls on signatories to reach net-zero carbon emissions by 2040. The signatories play a critical role in stimulating investment in the development of low-carbon products and services.

Sustainable strategies and targets are one of the crucial topics of this research. The strategies and targets will be discussed in line with the company's activities to show the sustainability plans and implementation. Therefore, it will provide to define the company's sustainability direction of sustainability.

2.5 Sustainable value

Sustainable value represents environmental sustainability, social and economic value (Evans, et al., 2017). According to (Hart & Milstein, 2003), a sustainable value framework can clarify the opportunities associated with sustainable development that can create value. As shown in Figure 4, the framework model is built upon a vertical and horizontal axis. The vertical axis represents today's activities and future technology and markets, which realize short-term results while generating expectations for future growth. The horizontal axis reflects the internal skills and capability with external perspective and knowledge. It emphasizes the technical core to operate without distraction while remaining open to new perspectives and technologies.

Four sets of drivers are related to global sustainability. The first set of drivers is associated with industrial material consumption, pollution, and waste generation. This leads to an opportunity for sustainable development is to lower cost and risk through resource efficiency and pollution prevention. Resource efficiency provides reduction of waste and emission from operation to utilize better inputs resulting in lower costs and raw material and waste disposal. Effective pollution prevention requires continuous improvement and quality management. Therefore, to bring value, the strategy relates to pollution prevention.

Another driving factor is the interconnection of civil society, which requires the transparency and responsiveness of operations. This links to the product stewardship strategy, which includes the scope of the whole product life cycle that integrates stakeholders' interactions with external parties: suppliers, customers, regulators, communities, non-governmental organizations, and media. The product life cycle covers raw material input through the production process to product use and disposal. Engaging stakeholders in the ongoing operations offers lower environmental impacts throughout the value chain, enhancing reputation and legitimacy.

The third set of drivers relates to the development of new, disruptive technologies that potentially reduce the human footprint on the planet. Key factors in creating value for this driver are innovation and technological change. This links to a clean technology strategy, which can reduce the negative impacts of operations and provide solutions to social and environmental problems that tend to pursue long-term challenges to generate future growth.

The last set of drivers connects to the increasing population, poverty, and inequality due to globalization. Within this driver, facilitating inclusive wealth creation and distribution can create value. More inclusive two-way dialogue and collaborations with stakeholders can help grow pathways and trajectories in previously unserved markets through sustainability vision. This relates to the strategy of sustainability vision, which can facilitate ideas by creating a shared roadmap to guide organizational priorities, technology development, resource allocation, and business model design.

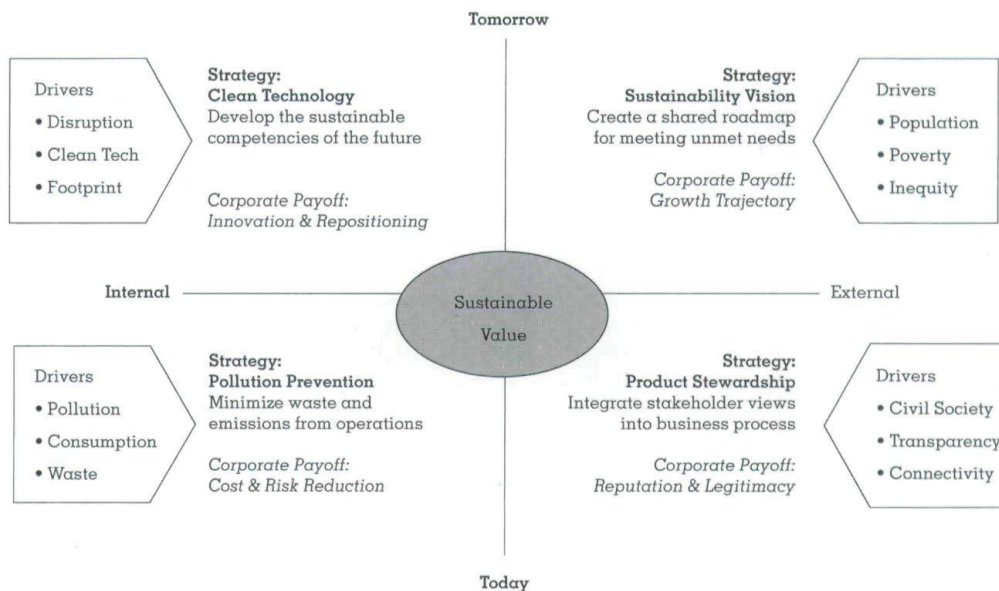


Figure 4 Sustainable value framework
Source: (Hart & Milstein, 2003, p.57)

The sustainable value framework will be applied in this research to help analyze and understand the sustainability activity within the company based on an internal-external aspect with the current situation and future plans. This research will particularly investigate the sustainable value build related to clean technology, sustainability vision, pollution prevention, and product stewardship. Hence, this will provide to trace of how sustainability is utilized.

2.6 SWOT analysis

Strengths, Weakness, Opportunities, and Threats (SWOT) analysis is a tool that can evaluate an organization's activity (Gürel, 2017). It has been used in management literature for half a century (Helms & Nixon, 2010). SWOT analysis helps gain insight into an organization's

internal and external business environment by positioning the resources and environment in the four areas (Phadermrod, Crowdera, & Wills, 2019). It assesses the positive and negative influence of internal and external factors on a system (Ishola, et al., 2015). The widespread application of SWOT analysis indicates its usefulness and clarity for identifying system improvements (Beloborodko, et al., 2015). SWOT analysis has various benefits, including helping define the future of organizations to move beyond daily problems and current situations. It also has some limitations, such as it is not possible to determine the priorities of factors identified and focus on them in detail (Gürel, 2017).

According to Gürel (2017), SWOT analysis consists of internal and external dimensions. The internal dimension includes the organizational factors of strength and weakness. Meanwhile, the external dimension includes environmental factors of opportunities and threats. Strengths represent the organizational characteristics that place at an advantage relative to others, while weaknesses demonstrate the disadvantage relative. Opportunities refer to the external elements in the environment that provide benefits for the organization. In contrast, threats are the external elements in the environment that could cause difficulty for the organization.

In this research, a SWOT analysis will be conducted to help recognize the company's positive and negative sustainability aspects. This will help evaluate the company's sustainability spectrum based on the company's actual performance. Therefore, enabling to identify the sustainability progress of the company.

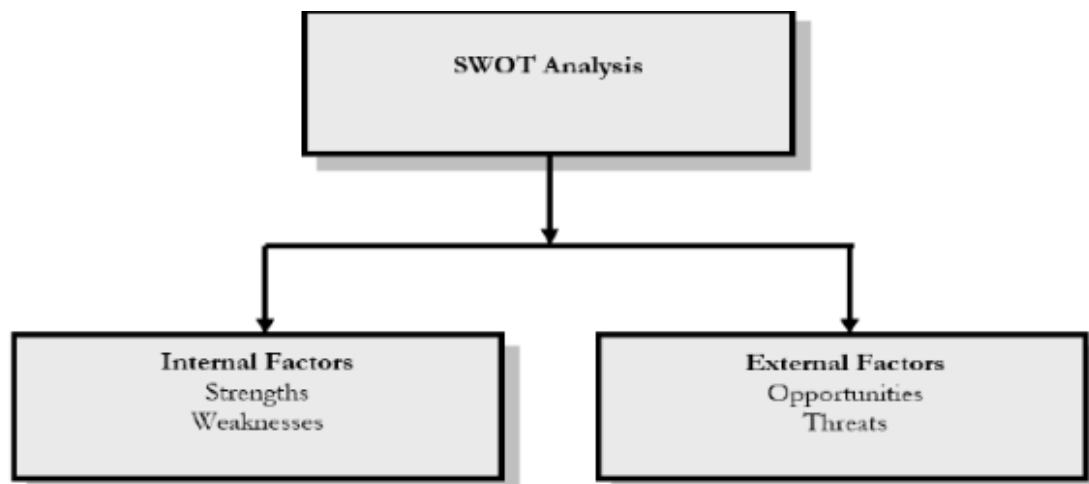


Figure 5 SWOT analysis
Source: (Gürel, 2017, p.995)

2.7 ESG ratings

Many public and private companies are evaluated and assessed by their environment, social, and governance (ESG) performance by various third-party agencies and indices or rankings (Huber, Comstock, Polk, & LLP, 2017). The ESG ratings measure a company's resilience to long-term, industry material environmental, social, and governance risks by using rating agencies' own research methodologies (Escrig-Olmedo, Fernández-Izquierdo, Ferrero-Ferrero, Rivera-Lirio, & Muñoz-Torres, 2019). The ESG ratings served as external recognition proxies for actual sustainability performances.

There are many ESG rating agencies provided, including focused rating agencies. For example, MSCI rating focuses on all the ESG aspects, while CDP rating focuses primarily on the environmental impact aspects. ESG rating agencies influence the role of steering businesses towards a sustainable future (Veenstra & Ellemers, 2020). With many ESG rating agencies available, it brings ambiguity as one provider to another may alter the study results and conclusion, which challenges companies to contribute to an environmentally sustainable and socially just economy (Berg, Koelbel, & Rigobon, 2020). A high ESG rating can hedge against climate shocks and unexpected changes in regulations (Cornell, 2021). The methodologies used by ESG rating providers or raters are varied and inconsistent, which can lead to different outcomes (Feifei Li & Ari Polychronopoulos, 2020).

An example of the ESG ranking index is Dow Jones Sustainability Indices (DJSI) and Sustainalytics. The Dow Jones Sustainability Indexes (DJSI) is a family of indices under the S&P Dow Jones Indexes and RobecoSAM that evaluates the world's largest companies and announces industry leaders' sustainability performances. The rankings in DJSI are available for over 7000 companies categorized in 61 industries. Sustainalytics is an ESG ranking that evaluates the sustainability performance of companies worldwide, categorized into 42 industries. DJSI category of the industry has a broader amount because it provides a more specific category. For instance, in Sustainalytics, there is a category of the electrical equipment industry, while in DJSI, the electrical equipment industry can be categorized to a more specific term into electric utilities, electrical components & equipment, and electronic equipment instruments and components. The electrical components and equipment industry supports access to power distribution and renewable energy generation and provides innovation for improving energy and resource efficiency in manufacturing and process industries.

This research will also consider the status of companies' sustainability performance in their ESG ranking by DJSI and Sustainalytics. This will strengthen the analysis of the research. DJSI and Sustainalytics ranking will be used to evaluate the company's performance based on each of their methodologies. With the different methodologies, agencies may alter different results. This data will be helpful by providing insights and validation on the position of the company and strengthening the analysis.

2.8 Conceptual model

Based on the theoretical concepts discussed, the conceptual model has been developed. The conceptual model has connected the theoretical concepts and displayed the relation of sustainability performances. External drivers influence the activity of the company's sustainability to contribute to global goals. These external drivers include the global environment and social challenges, existing standards and regulations. As the private sector must comply with the regulations, it has provided more innovative development space towards the organization's sustainability. The presence of external drivers impacts the implementation of sustainability from the private sector and urges to demonstrate sustainability activity.

Developing sustainability activity of the private sector is associated with sustainability strategies and targets, delivering sustainable value, sustainability transparency, and reporting. The sustainability activity allows to present the impacts of the private sector on the environment and society, the direction of the company activity, and the sustainable value applied. As a result of the influence of external drivers and sustainability activity, it determines the quality of sustainability performance.

The sustainability performance can represent the sustainability characteristic and uniqueness of each company. The performance indicates the capacity and outcome of the sustainability implementation, which can demonstrate the strength, weaknesses, opportunities, and threats of the organization. Based on the strength, weaknesses, opportunities, and threats, there are problems and potentials of the company. The potential is associated with the achievement of contributing to the global target, while the problems indicate the constraints that occurred.

These sustainability performances will affect external recognition of the company reputation from an external perspective, such as ESG rating agencies and global organizations, as they are able to assess the company. In consequence, the external recognition leverage the private sector to reflect and evaluate the company's sustainability to develop improvement to contribute to achieving the global goal. Hence, sustainability evaluation impacts the sustainability activity to be improved.

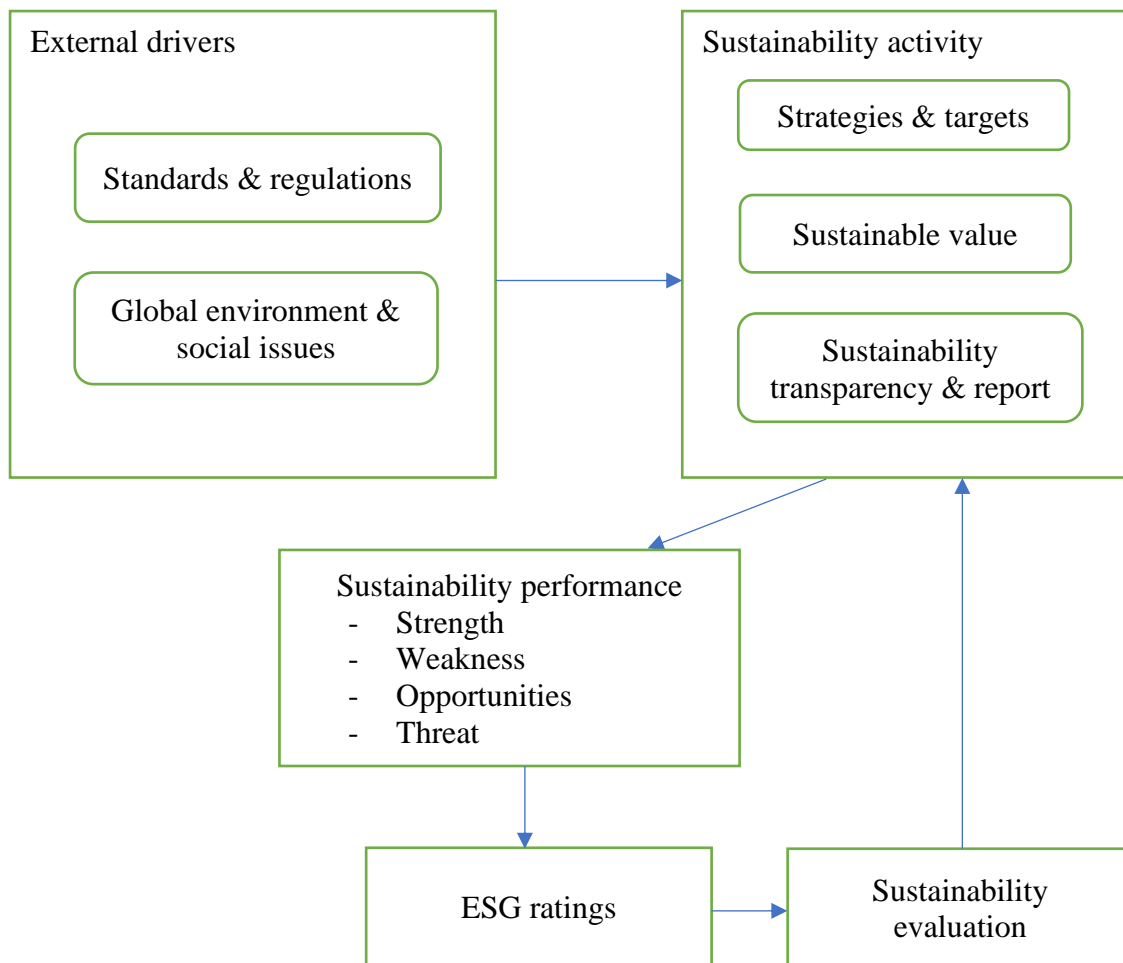


Figure 6 Conceptual model diagram

2.9 Scope

In this study, the research will focus on electrical components and equipment industries and available ESG data. According to the Dow Jones Sustainable Index (DJSI), the electrical components and equipment industries can be distinct into classes. This research will evaluate one company within the gold class, Schneider Electric SE, and one company within the silver class, Signify NV. Signify is a multinational lighting company originally from The Netherlands that was formed in 2016 (Signify, 2021). Previously Signify was a merger of Phillips company focusing on connected LED lighting solutions. Now Signify focuses on lighting for professionals, consumers and lighting for the Internet of Things. Schneider Electric is a French multinational company providing energy and digital solutions that was established in 1836 (Schneider Electric, 2021). Both companies will be compared towards their strategies and performances because they are within the same peer industry and are multinational companies from Europe, thus providing an apple-to-apple comparison. The comparison enables to demonstrate an objective perspective.

As previously mentioned, the main research question is *“How do the sustainability strategy of Schneider Electric and Signify influence and improve their sustainability performance?”*

The main question of the research evaluates the influence of sustainability strategies and the performance of the companies. The result of this research will answer the main question by defining the company sustainability spectrum and demonstrate a comparison of both companies on the company's progress to the global goals. Based on the analysis and performance of the company, the research will explain the relation of the sustainability strategy towards the performance.

In relation to the theoretical insights from various concepts, the following sub-question help to guide answering the main question:

1. Do the companies align with the sustainability standards and what sustainability standards influence the action to implement sustainability?

The research identifies the sustainability standards and regulations that is applied relating to sustainability. Also, analyze what standards are relevant and strongly connected to sustainability implementation.

2. Do the sustainability activities implemented by the companies exhibit sustainability benefits that it is claimed to have?

The research explores the benefits and impact of the activities on the real performance of the company and links these matters to the SDGs and standards. The sustainability activities include the strategies and targets, sustainable value, and sustainability transparency. Preferably the benefits will be fully in line with the standards and have been implemented properly.

3. What challenges exist in sustainability performance and how can they be improved?

The research explains the sustainability performance applied. Then based on the SWOT analysis, this research will have a clear picture of the gap and the achievement of the sustainability performance as compared with the standard. In this part, it is also identified the problems faced by the company. The tools analysis will include an external recognition analysis of the ESG ratings from DJSI and Sustainalytics and insights from external parties, including the media and global organizations, are used to provide additional information on the company's sustainable performance globally.

4. What is the current staging of the company's sustainability implementation?

This subquestion will consider the performances and strategies of the company. Also, the current staging of sustainability will be explored and provide recommendations for further improvements.

3 Methodology

This chapter elaborates on the methodological approach of the research. The first section explains the research strategy and philosophy. Then an explanation of the research methods and the validity and reliability are discussed.

3.1 Research strategy

Case studies allow the researcher to explore single or multiple bounded cases involving multiple sources to provide a more comprehensive view (Harrison, Birks, Franklin, & Mills, 2017). A case study can address a wide range of questions, and the outcomes lead to an in-depth understanding of practices. This research uses a case study approach because the scope identifies two organizations using multiple sources of evidence to a comprehensive depth. Therefore, the research provides to gain an understanding of the issue in a real-life setting. The design of this research is a case study focusing on the electric equipment industry of two companies named Schneider Electric and Signify. The selection of industries is based on the DJSI ESG rating industry category of electrical equipment within two different classes. This enables to provide insight into the different levels of sustainability practices. Narrowing into two companies allows gaining a more detailed understanding as there are many industries in which the subjects are too broad to investigate in depth.

Paradigm is defined as basic belief systems that guide action in an ontological and epistemological way (Guba & Lincoln, 1994). This research will follow a realism ontology and post-positivist epistemology, which indicates applying a post-positivism paradigm. Post positivism implies that objective reality exists but can be imperfect (Guba & Lincoln, 1994). According to De Groot (1969), some objective research refers to intersubjective knowledge, which indicates that the validity of knowledge or interpretation depends on certain agreements or rules. The research philosophy is a post-positivism paradigm, as the research includes a realism approach involving an objective manner. A realist believes that the reality that exists can be understood as truth that is independent of human experience (Moon & Blackman, 2014). The research uses a post-positivism paradigm because the research focuses on explaining the individual experience of two companies.

3.2 Research methods, data collection and data analysis

Qualitative data is typically directed at the exploration and description of the research (Thiel, 2014). Qualitative data will be used for data collection through literature, reporting, documents, and questionnaires with open and closed-ended questions. A qualitative approach is suitable for this research because the outcome of the research is to evaluate the characteristics of two organizations, which emphasizes words rather than quantification. By using a qualitative approach, it can secure rich descriptions and examine the constraints in everyday life. The case of the two companies will be compared, which should lead to a

conclusion about how is the sustainability implementation of the company towards the global goals. In the end, the research should help companies to assess best practices and improvements to contribute to achieving the global goals.

The data collected will include the sustainability report of each company. This will support identifying the strategies and performance of the company. Also, the ESG rank will be analyzed and collected from DJSI and Sustainalytics to identify the company's ESG position based on their industry and ESG characteristics. Acknowledging the company's ESG position enables to strengthen the analysis by obtaining more information. Other insights from external parties such as the media and global organizations are used to provide additional information on the company's sustainable performance globally.

The research data analysis will conduct a comparative study between Schneider Electric, which is in the gold class, and Signify, which is in the silver class based on the DJSI assessment. The industry's sustainability activity will be evaluated by their strengths, weaknesses, opportunities, and threats (SWOT), generating a SWOT analysis. Also, the level of sustainability application is explored. Thus, the research evaluates the influence of sustainability strategies and the performance of the companies.

3.2.1 Questionnaire

The questionnaire focuses on the general electrical equipment industry ESG performances. The respondents were aimed at third parties of ESG ratings, media, and global organizations, such as Dow Jones, Sustainalytics, MSCI, ESG Communications, United Nations, and Science Based Targets initiatives. These organizations are accountable because they are independent organizations that assess corporate ESG performances within their own approach. The advantages of the questionnaires lie within the time availability and the lack of bias as responses are anonymous. The questionnaire is convenient for the respondents because of the flexibility to complete at the respondents' own pace (Bryman, 2012). The disadvantage is that no one can help respondents if they have difficulties answering (Bryman, 2012). Therefore, it is essential to provide clear instructions and unambiguous. Another anticipation is that the researcher includes the contact information if respondents have any questions. Regarding ethical consideration, the questionnaire's responses are confidential and only for research purposes.

The questionnaire was sent to several institutions and many have contacted back, but due to internal issues such as the pandemic impact and organization structure, the institutions could not have a representative participate in the questionnaire. Instead, the institutions suggested analyzing the published reporting and insights that are publicly available. Hence, the pandemic has displayed a big impact in completing this thesis. Nevertheless, the institutions' reporting was used to gain an objective perspective of Signify and Schneider's sustainability

performance from external parties. Since there were no willing respondents due to the pandemic situation, the questionnaires is not discussed in the empiric chapter.

3.3 Validity and reliability of the research

Validity concerns the integrity of conclusions generated from research (Bryman, 2012). By using multiple methods of data collection, triangulation contributes to validating the results of the research. Triangulation indicates that more than one method is employed in a study to re-examine the data collection and research results (Thiel, 2014). Within the post-positivism perspective, hypothesis falsification is used in triangulation (Guba & Lincoln, 1994). The research hypothesis interprets that a strong sustainability strategy and target influence a high sustainability performance, creating quality sustainability recognition. This relates to the main research question regarding the relationship of sustainability practices to sustainability performances. According to (Thiel, 2014), validity and reliability can occur by taking a diversified approach, and the researcher gathers as much information as possible to ensure that the data collected are valid. In this research, various data will be collected from literature, company reporting and information, ESG rankings, and media. The internal and external data source enables to provide internal and external validity. The reporting of a company is legitimate because it refers to the accounting of the finance and legal department. The reporting data is open to the public as a requirement in the stock exchange, such as Nasdaq and NYSE. Hence the reporting is audited by third parties. This provides reasonable assurance on the performance and statements in the reporting, which accounts to be objective. The published reporting from third parties is used as an addition to gain insight into the industry's practices. Therefore, it will enhance a more objective indicator. In addition, the applied external validity relates to the results of other theories in general. Enhancing reliability can be applied by keeping a database specifying the steps taken in the study, and the data sources used are documented so that the whole process can be reviewed or checked afterward (Yin, 2008). In this research, all data sources are documented.

Table 1 Research internal & external data source

Internal data source	External data source
Signify: Annual Report 2020, company website, company policies	ESG rankings & index: Dow Jones Sustainability Index, Sustainalytics, MSCI, CDP, Eco Vadis
Schneider: Annual Report 2020, company website, company policies	Media: M&G Investment. LED Magazine, Australian Circular Economy Hub, Harvard Business Review, Pulpapernews, Business Wire, Business Standard, LEDInside, CGTN
	Global organizations: UNFCCC, WEF, World Business Council for Sustainable Development, Sustainable Energy for All

4 Findings and results

In this chapter, the four sub-questions will be answered. The first section discusses the standards and regulations relating to the company's sustainability, and the second section evaluates the sustainability activity. The third section explains the challenges and improvement of sustainability performances. Lastly, the fourth section investigates the staging of sustainability applications.

4.1 Do the companies align with the sustainability standards and what sustainability standards influence the action to implement sustainability?

Looking to the climate action of nations worldwide, around 80% of emissions of the G20 nations are not on track to meet the Paris commitment (UNEP, 2019). With this great influence, G20 nations must be leaders in climate commitment because it will have a very significant impact. It is necessary for an unambiguous commitment from all G20 nations towards the Paris agreement goal, where the national climate plans need to commit more ambitious actions and deliver concrete policies (UN, 2021b). The European Union is an example as the frontrunner of international ambition to tackle climate change. The European Union has enhanced the Nationally Determined Contributions (NDC) to 55% from the previous target of 40% (European Commission, 2021a). With the new regulation, it is hoped that it can encourage the actions of all sectors. However, ambitious targets for the industry are not set by countries (UNEP, 2019). Therefore, industries must have initiatives in aligning the global targets. Signify and Schneider are multinational companies from Europe, where Signify is from The Netherlands, and Schneider is from France. Multinational companies can help the SDGs be successful by bringing strength with their global reach, technology, and large capacity to achieve large-scale solutions (Sachs J. , 2012). Thus, both companies must consider following European regulations, which stimulate the sustainability actions taken.

Within the company reporting on sustainability, several standards and frameworks are used to help express sustainability statements and demonstrate commitments to sustainability. GRI standards are used to report the organization's impacts on the environment, social, and economy (GRI, 2021). Each topic standard consists of disclosures specific to the topic. GRI standards 102 consists of general disclosures about an organization's contextual information, and GRI standards 103 consists of disclosures on the management approach that the organization has set. Within GRI 102 standards, the disclosure number 1-13 explains the organizational profile, 14-15 discusses the strategy, 16-17 about ethics and integrity, 18-30 concerning governance, 40-44 on stakeholder engagement, and 45-56 regarding reporting practice. GRI 102 and 103 are universal standards. There are three other series of standards that are topics-specific standards: GRI 200 for economic topics, GRI 300 for environmental topics, and GRI 400 for social topics. These topic-specific standards are used to report

information on the organization’s impacts, such as emissions, employment, and indirect economic impacts.

Both of the company uses GRI standards to incorporate their sustainability information. As shown in

Table 2 are the indicators that the company complies with to disclose their sustainability statements. The topics of general disclosure, energy, and emissions are both indicated in each report. However, the specific topics that are applied are not the same. Referring to the number of disclosed indicators, Signify describes having more compliance with the GRI standards. Regarding the specific topics, Schneider has more focus on environmental topics such as water, waste, and employment. Conversely, Signify has more details on humanitarian topics such as human rights and non-discrimination. Both companies did not state using GRI 200 about economy topics. This could be because the economy is included in the financial statements rather than the sustainability statements. Another cause could be that GRI standards are voluntary, which means the companies choose not to disclose the topic.

Table 2 GRI standards

GRI Standards	GRI Standards indicators disclosed by Schneider	GRI Standards indicators disclosed by Signify
GRI 102: General disclosure - organizational profile	8, 41	1-56
GRI 103: Management approach		1-3
GRI 302: Energy	1, 4	1-5
GRI 303: Water	1	
GRI 305: Emissions	1-5, 7	1-7
GRI 306: Waste	2-3	
GRI 401: Employment	1-2	
GRI 403: Occupational health and safety	1-2	
GRI 404: Training and education	1,3	
GRI 406: Non-discrimination		1
GRI 407: Freedom of association and collective bargaining		1
GRI 408: Child labor		1
GRI 412: Human rights assessment		1-3

Note. The numbers indicate the disclosure number the company follows according to the GRI standards. Adapted from (Signify, 2020, p.1-187) and (Schneider, 2020, p. 1-431)

The United Nations Global Compact and SDGs play important criteria within the companies’ strategies. Both Signify and Schneider incorporate their business activities while also making efforts to contribute to help achieve the SDGs. This aims to benefit both the industry and

reduce the severe impact on society and the environment. Both companies join SBTi to show they commit to ambitious climate action in line with the Paris Agreement. Signify commits to reduce scope 1 and 2 greenhouse gas emissions to 70% by 2030 and reduce scope 3 greenhouse gas emissions from the use of sold products to 30% by 2030. On the other hand, Schneider commits to reducing scope 1 and 2 greenhouse gas emissions to 100% and scope 3 emissions to 35% by 2030. Furthermore, Schneider increases the annual sourcing of renewable electricity from 30% in 2018 to 100% by 2030. In comparison, Schneider is more ambitious with the commitment towards scope 1 and 2 greenhouse gas emission. Signify and Schneider comply with TCFD that specifically concerns climate-related risks and opportunities regarding governance, strategy showing actual and potential impact, risk management about the organization process for identifying, assessing, and managing climate-related risks, and metrics and targets to assess and manage the risks. The companies involve internal engagement and experts to give an indication of the localization and magnitude of climate-related risks and opportunities. Both of the companies refer to their carbon footprint for assessments and monitoring of climate.

ISO, ILO, and OECD are common standards that companies use to refer to specific topics disclosed in the reporting. Both companies adhere to the ILO Declaration on Fundamental Principles and Rights at Work, which mainly promotes work rights to address salient human rights issues, including freedom of association and collective bargaining, eliminating forced labor and child labor, and eliminating employment discrimination. Freedom of association considers the individual rights of workers to freely join in or quit labor organizations to assert and defend their interests. Child labor and forced labor are prohibited so as to deprive children of harm to their physical and mental development and avoid involuntarily or unwillingly labor. In addition, both companies follow OECD Due Diligence Guidance for the responsible supply chain of minerals from conflict-affected and high-risk areas. Such compliance triggers the commitment not to purchase raw materials, subassemblies, or supplies which contain conflict minerals. With that, both are active members of the Responsible Mineral Initiative, which enables the Responsible Mineral Initiative to run the audit program to verify the conflict-free status.

ISO standards are voluntary standards with over than 18,000 types of standards, and companies can obtain certification schemes with external third parties (ISO, 2021). Achieving the certification requires an audit by an external third party. Both companies have several similar certifications, such as ISO 14001: environmental management by reducing environmental impacts of emissions and reducing waste. Also, ISO 9001: quality management system in demonstrating efficiency and reducing product failures, ISO 45001: occupational health and safety by the ability to reduce accidents in the workplace, and ISO 27001: information security by keeping sensitive information secure. The difference is that Signify obtains ISO 62443: product security relating to cybersecurity processes and measures. In contrast, Schneider obtains ISO 50001: energy management in cutting energy consumption,

ISO 14025: environmental product declaration by providing a material assessment of the recyclability rate and the carbon footprint and damage to the ozone layer, ISO 14021: environmental labels and declarations by demonstrating no self-declared claims in sustainability which do not lead to misinterpretation and an explanatory statement is included along with the claim, and ISO 26000: social responsibility by providing programs for supplier sustainability. Therefore, Schneider has more certification in the environmental and social aspects, while Signify has a certification focus on products.

Signify used a general standard of NFRD and Schneider applied a sector-specific standard from SASB. NFRD is the EU law that describes the rules on disclosing operation and management information on social and environmental challenges for companies (European Commission, 2021b). Signify information disclosed includes explaining policy implemented, results, and risk related to various categories of social matters and treatment of employees, environmental matters, respect of human rights, anti-corruption and bribery, and diversity. SASB consists of industry-specific standards to help disclose relevant environmental, social, and governance financial performance (Sustainability Accounting Standards Board, 2021). Schneider applied topics of energy management, hazardous waste management, product safety, product life cycle management, materials sourcing, business ethics, and activity metrics. EU NFRD is not mentioned to be used within Schneider reporting. In contrast, Signify reporting did not refer to SASB. SASB guidelines help Schneider to provide information specialized for the Electrical and Electronic Equipment sector.

Following the sub-question, both companies have aligned with many sustainability standards.

Table 3 illustrates the comparison of the sustainability standards and regulations used in the two companies. Both companies have adhered to the same standards based on the applied standards, including GRI, UN Global Compact, TCFD, SBTi, ISO, ILO, OECD, RoHS Directive, and REACH Directive. Hence, these standards exhibit the most influential standards for companies to implement their sustainability. However, between these standards and regulations, GRI and UN Global Compact comprise diverse environmental, social, and governance topics, while the others mainly cover a particular topic. For example, SBTi is specifically related to climate action, the environmental topic, while ILO is related to labor conditions, which is more connected to the social aspect. These specific standards often support completing the undisclosed topics. In addition, the standards that comprehensively cover all the ESG topics are GRI and the UN Global Compact, and several other standards are used to supplement missing disclosures.

Table 3 Sustainability Standards and Regulation

Standards and Regulations	Schneider	Signify
IIRC		√
GRI	√	√

Standards and Regulations	Schneider	Signify
United Nations Global Compact	√	√
SBTi	√	√
TCFD	√	√
ISO	√	√
ILO	√	√
OECD	√	√
NFRD (EU Directive 2014/95/EU)		√
SASB	√	
RoHS Directive (2011/65/ EU)	√	√
REACH Directive (EC1907/2006)	√	√

Note. Adapted from (Signify, 2020, p.1-187) and (Schneider, 2020, p. 1-431)

Among others, GRI is a standard that is commonly used around the world (KPMG, 2020). It embeds a more comprehensive environment, social, and governance indicator for companies to fulfill. Many organizations have used this standard as guidance because of its explicit characteristic and use of common language. Hence, it is easily understandable to all in providing clear data. GRI scope also supports global consolidation including external impacts on the world beyond financially material factors, so the standard can be adaptable worldwide. Even GRI identifies key ESG impact and takes into consideration the organization activity impact and decision on stakeholders. Therefore, the adaptable characteristics of GRI are also appealing to implement. Another advancement is the partnerships with international organizations such as the Global Compact, UNEP, OECD, and ISO. As a result of the partnerships, it progressively builds trust and recognition with companies and other stakeholders to use the standards. Another common standard is the UN Global Compact principles, which are derived from other regulations such as the Universal Declaration of Human Rights, ILO, Rio Declaration on Environment and Development, and the UN Convention Against Corruption. Thus, because of its simplification and integrating characteristic of covering multiple topics to meet fundamental responsibilities the companies commonly apply the UN Global Compact principles.

Nevertheless, the flexibility of companies to incorporate the standards creates space to incorporate diverse standards. For instance, as seen in the case of Signify and Schneider, GRI standards that are mainly applied are the general disclosure of organizational profile, which connects more of its governance profile. But other standards are used as well to guide and complement their sustainability. Therefore, other standards are needed to provide a comprehensive sustainability implementation.

4.2 Do the sustainability activities implemented by the companies exhibit sustainability benefits that it is claimed to have?

By observing the sustainability activity of Signify, Signify has not provided a long-term strategy until 2030 regarding its sustainability efforts, in which 2030 and 2050 will be the year where the SDGs and the Paris Agreement targets are planned to be achieved. However, Signify mentions to commit doubling its positive impact on society and the environment by 2025. The doubling commitments support among others to increase the pace to achieve 1.5°C by enhancing emission reduction, encouraging women in leadership, providing more circularity of products to minimize waste, and helping to distribute lighting to off-grid areas to support local entrepreneurship such as providing light to enable to see better where lighting is limited. Based on the qualitative target for 2025, Signify aims to be more ambitious and fasten the efforts in achieving earlier than specified by the global targets.

In comparison to the sustainability progress, Signify have been in line to prove to reduce carbon emissions by becoming carbon neutral. This has a positive influence as the emitted emissions are constantly monitored and reduction of emission occurs. In addition, Signify joined The Climate Pledge, a call for action to commit to decarbonization, on November 17, 2020, and included their 2025 commitment as a signatory. This Climate Pledge enables to reinforce the company commitment by monitoring the progress of the signatory as the company must regularly report on their activities (The Climate Pledge, 2021). Hence providing monitoring reports to other parties proves that the carbon reduction is more validated.

The Signify program of 'Better Lives Better World' connects their growth to sustainability strategy that aims to bring purpose to life and lead to a more sustainable future. Specifically, the strategy focuses on climate action, energy efficiency, circular economy, food availability, safety & security, health & well-being, and the workplace. Regarding the ESG dimension, the strategy for the workplace supports the social category because it relates to human capital and stakeholder participation. Other strategies of climate action, energy efficiency, and circular economy are related to the environment because of the effort to reduce pollution and improve compliance. However, the sustainability strategy does not explicitly unify the economic strategy but implicitly connects the stakeholder contribution to financial goals.



Figure 7 Signify Sustainability strategy and targets

Source: (Signify, 2020, p.14)

Six SDGs are stated to make the most significant impact within Signify 2020 strategies, including SDG 3: Good health and wellbeing, SDG 7: Affordable and clean energy, SDG 8: decent work and economic growth, SDG 11: sustainable cities and communities, SDG 12: responsible consumption and production, SDG 13: climate action. Signify climate action strategy links to SDG 13 and 7, focusing on the commitment of carbon-neutral operations and

carbon footprint reduction of products and suppliers, delivering more energy-efficient and solar lighting, and commitment to 100% renewable electricity in operations. The circular economy area relates to SDG 12, emphasizing circular products, systems, and services, zero-waste to landfills at manufacturing sites, and establishing more sustainable packaging. The food availability and health & wellbeing area are associated with SDG 3, which aims to increase food availability and quality through horticulture and animal lighting and increase health and wellbeing through human-centric and UV-C lighting. Moreover, the safety & security area contributes to SDG 11, which aims to enable smart cities by increasing the safety & security of roads and urban areas, enabling safe & sustainable workplaces in offices and industry, and light lives in off-grid areas. The workplace strategy relates to SDG 8, where it targets improving the safety & well-being of employees and suppliers and training entrepreneurs.

Priority SDG	Material topic	Sub-topic included	Our contribution	Boundary	
Brighter Lives 	Human capital development	<ul style="list-style-type: none"> Employee engagement Diversity and inclusion Talent management 	10.3.1 Human capital development	<ul style="list-style-type: none"> Own operations Own operations Own operations 	
	Human rights	<ul style="list-style-type: none"> Human rights in our operations Living wages Social responsibility in our supply chain Responsible mineral sourcing 	10.3.2 Human rights	<ul style="list-style-type: none"> Own operations Own operations / Supply chain Supply chain Supply chain 	
	Safety at work	<ul style="list-style-type: none"> Occupational Health & Safety 	10.3.3 Safety at work	<ul style="list-style-type: none"> Own operations 	
	Business Ethics	<ul style="list-style-type: none"> Acting with Integrity Product quality Share-performance & pay-out policy 	10.3.4 Acting with integrity 10.3.4 Acting with integrity 11.6 Share performance 11.4 Capital allocation	<ul style="list-style-type: none"> Own operations Use phase Own operations 	
		<ul style="list-style-type: none"> Responsible procurement practices Responsible tax policy Big data and customer privacy 	10.3.2 Human rights 10.3.4 Acting with integrity 10.3.4 Acting with integrity	<ul style="list-style-type: none"> Own operations Own operations Use phase 	
		Social impact of light	<ul style="list-style-type: none"> Human-centric lighting Food availability and quality Access to light 	10.3.5 Social impact of light	<ul style="list-style-type: none"> Use phase Use phase Use phase
	Better World   	Energy efficiency	<ul style="list-style-type: none"> Energy efficiency of our products, systems and services 	10.4.1 Energy efficiency of our products, systems and services	<ul style="list-style-type: none"> Use phase
		Circular economy	<ul style="list-style-type: none"> Circular economy portfolio Weight & materials Waste management 	10.4.3 Circular economy	<ul style="list-style-type: none"> Use phase Own operations / Use phase Own operations
		Responsible packaging	<ul style="list-style-type: none"> Responsible packaging 	10.4.4 Responsible packaging	<ul style="list-style-type: none"> Use phase
		Hazardous substances	<ul style="list-style-type: none"> Products substances Regulated substances in production processes 	10.4.5 Hazardous substances	<ul style="list-style-type: none"> Use phase Own operations
Water usage		<ul style="list-style-type: none"> Water usage 	10.4.6 Water usage	<ul style="list-style-type: none"> Own operations 	
Carbon footprint		<ul style="list-style-type: none"> Operational carbon footprint Carbon footprint of our supply chain 	10.4.2 Carbon footprint and energy	<ul style="list-style-type: none"> Own operations Supply chain 	
Biodiversity		<ul style="list-style-type: none"> Biodiversity 	10.4.7 Biodiversity	<ul style="list-style-type: none"> Own operations 	

Figure 8 Signify Sustainability program
Source: (Signify, 2020, p.139)

In relation to analyzing the interpretation of the sustainability claims and the relationships between SDGs in the program was not defined in detail and transparent. I conducted an analysis of the contribution of Signify towards the SDGs indicator. As shown in

Table 4, there are 15 SDGs target indicators identified within Signify's sustainability strategy. For example, the climate action strategy stipulates efforts to reduce carbon emissions in line with the Paris Agreement. This is related to the climate compliance with regulations and standards in target indicator 13.2. Also, audits are conducted to enable monitoring the reduction of environmental impact on carbon emissions and safety in the operations.

Furthermore, climate action contributes to target indicators 7.1, 7.2, and 7.3 because of the implementation to increase energy efficiency lighting and enhance renewable electricity in their operations.

Table 4 Signify SDGs targets indicator contribution

SDGs	SDGs Target indicators
2	2.4 Ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production
3	3.4 Reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being 3.9 Substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination 3.b Support the research and development of vaccines and medicines for the communicable and non-communicable diseases in developing countries
4	4.4 Substantially increase the number of youth and adults who have relevant skills
5	5.1 End all forms of discrimination against all women and girls everywhere
7	7.1 Ensure universal access to affordable, reliable and modern energy services 7.2 Increase substantially the share of renewable energy in the global energy mix 7.3 Double the global rate of improvement in energy efficiency
8	8.3 Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises 8.5 Achieve full and productive employment and decent work for all women and men, and equal pay for work of equal value 8.7 Take immediate and effective measures to eradicate forced labor, end modern slavery and human trafficking and secure the prohibition and elimination of the worst forms of child labor 8.8 Protect labor rights and promote safe and secure working environments for all workers
9	9.4 Upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes
10	10.4 Adopt policies, especially fiscal, wage and social protection policies, and progressively achieve greater equality
11	11.2 Provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety 11.c Support least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings utilizing local materials
12	12.5 Substantially reduce waste generation through prevention, reduction, recycling and reuse 12.6 Encourage companies to adopt sustainable practices and to integrate sustainability information into their reporting cycle
13	13.2 Integrate climate change measures into national policies, strategies and planning
16	16.b Promote and enforce non-discriminatory laws and policies for sustainable development

SDGs	SDGs Target indicators
17	17.14 Enhance policy coherence for sustainable development 17.16 Enhance the global partnership for sustainable development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources

Within the circular economy strategy, developing zero waste to landfills to reduce waste and creating sustainable packaging connects to support target indicators 12.5 and 12.6. This is because the waste are recycled, and the use of responsible packaging concerns the materials use which minimizes the environmental impact. In addition, reduction of waste can be related to target indicator 9.4 as it provides resource-use efficiency, but SDG 9 was not stated by Signify.

The food availability strategy is more connected to target indicator 2.4 because it supports increasing food production through agriculture lighting. However, Signify did not set SDG 2 as one of the significant SDG impacts. The strategy of health and well-being of society through Signify lighting products is concerning to target indicators 3.4 and 3.b because Signify supports improving road safety by implementing safe street lighting and UV-C lighting to inactivate bacteria and viruses. In addition, Signify supports access to lighting in off-grid areas, which encourages target indicators 11.2 and 11.c because the lighting helps the wellbeing of an area in the developed country.

The strategy related to the workplace focuses on the safety and wellbeing of employees and suppliers and sustainability in suppliers. The development to create a productive activity and a safe workplace environment for employees contribute to target indicators 8.3 and 8.8. Also, the safe and healthy workplace programs comply with OHSAS 18001 standards, ISO 45001 standards, and local regulations, which ensures a sound management system. Moreover, Signify contribute to SDG target indicator 3.4 and 3.b because it is stated that their products, such as UV-C lights help kill bacteria and virus. Also, product lighting helps the health and wellbeing of customers for eye visualization and food availability. On the other hand, the sustainability in suppliers is applicable for target indicators 3.9, 12.5, 8.7, 8.8, 16.4, 17.4, and 17.6, which covers labor, health & safety, environment, ethics and management systems. The supplier sustainability standards derive from the Responsible Business Alliance Code of Conduct and public-private initiatives of responsible minerals in the supply chain, including the European Partnership for Responsible Minerals. Regarding stakeholder engagement in the sustainable supply chain, audits and training are conducted and monitored. Signify also takes action against workers' human rights into their policies to prevent human rights violations and abuses. The application of acting with integrity ethics in anti-corruption relates to target indicator 16.5. Policies in place demonstrate the considerations of human rights in the company.

The diversity and inclusion in the workplaces can be related to target indicators 5.1, 8.5, and 10.3 because Signify plans to have more diverse gender and generation and the commitment to empower more women in leadership. Signify did not state its impact on SDG 5 and 10, but the effort to reduce inequality is shown in its implementation. Equal remuneration is an effort implemented of equality in pay that is regularly reviewed to comply with the local legal requirements in every operation, which contributes to target indicators 8.5 and 10.4. Even though Signify did not mention the impact in SDG 4, providing training to lighting entrepreneurs relates to target indicators 4.4 and 8.3. This is because Signify supports raising workforce quality and capacity-building through technical and business skills in the least developed country and supports underprivileged people trained in energy management.

When compared to Signify, Schneider has a long-term trajectory for its sustainability until 2050. For 2025, Schneider commits to reaching carbon neutrality in operations with quality offsets as well as 25 objectives under six long-term commitments in climate, equal, resources, generations, trust & local. Referring to their commitment, the areas of focus have changed except for climate. The Schneider sustainability impact (SSI) for 2025 consists of six long-term commitments translated into 12 programs. Schneider joined The Climate Pledge on September 23, 2020, and committed to being carbon neutral in operations by 2025, net-zero emissions by 2030 without offsets, and having all products carbon neutral by 2040.

The Group's sustainability roadmap

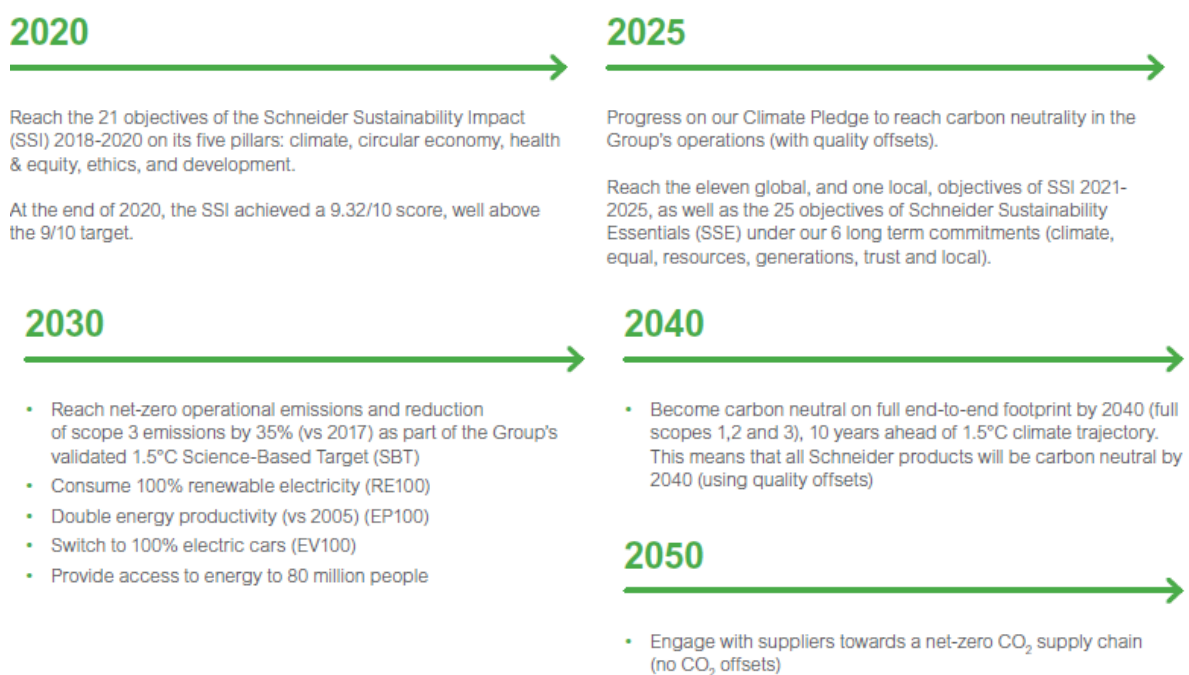


Figure 9 Schneider sustainability roadmap 2020-2050
Source: (Schneider, 2020, p.72-73)

Schneider has a purpose called 'Life is On' to make the most of energy and resources, bridging progress and sustainability for all. The sustainability strategy is built on five major pillars: climate, circular economy, health & equity, ethics, and development. The strategy can be

categorized into the ESG dimension, where the climate is an environmental category because of the commitment to prevent and reduce pollution from emission and energy. Health & equity and development link to the social category because it concerns the interaction of stakeholders and human resources. Ethics strategy is in the governance category as it involves stakeholder contribution such as anti-corruption.



Figure 10 Schneider sustainability strategy
Source: (Schneider, 2019, p.86)

Within the 2020 pillars, there are 21 key performance indicators (KPI) linking to all the 17 SDGs. The climate pillar relates to SDG 7, 9, 11, 12, 13, and 17, aiming to decarbonize operations and supply chain and create resource-sensitive products and services. Circular economy contributes to SDG 6, 8, 9, 12, 13, 14, 15, and 17 through designing products that demand less from the environment by respecting resources and the energy it takes to procure them. Health & equity pillar is associated with SDG 3, 5, 8, 10, 16, and 17, supporting efforts to promote overall wellness, learning and development, and safety. The ethics pillar relates to SDG 1, 3, 5, 6, 8, 10, 12, 14, 16, and 17, which commits to preserving peoples' dignity, advancing the communities in which influence is felt, and ensuring values are shared across the industries. Development pillar connects to SDG 1, 2, 3, 4, 6, 7, 8, 10, 11, 12, 13, 15, and 17 promote economic development in rural areas and support skills training.



Figure 11 Schneider sustainability target and program
 Source: (Schneider, 2020, p.84)

Table 5 is an analysis I generated to provide insights on the SDGs target indicator of Schneider as the SDGs contribution in the strategy was also not defined in detail and transparent. There are 32 SDGs target indicators identified within Schneider's sustainability strategy. For instance, the climate strategy relates to target indicator 13.2 by aligning climate measures with the carbon pledge. Also, in line with target indicators 7.1, 7.2, 7.3, 9.4, and 11.c to develop energy efficiency and decarbonization for internal and external. In addition, the climate strategy has partnered with civil society organizations, which relates to target indicator 17.16.

Table 5 Schneider SDGs targets indicator contribution

SDGs	SDGs Target indicators
1	1.4 Ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms
2	2.3 Double the agricultural productivity and incomes of small-scale food producers
3	3.b Support the research and development of vaccines and medicines for the communicable and non-communicable diseases in developing countries 3.8 Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all 3.9 Substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination
4	4.4 Substantially increase the number of youth and adults who have relevant skills
5	5.1 End all forms of discrimination against all women and girls everywhere
6	6.3 Improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials 6.4 Substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity
7	7.1 Ensure universal access to affordable, reliable and modern energy services 7.2 Increase substantially the share of renewable energy in the global energy mix 7.3 Double the global rate of improvement in energy efficiency
8	8.3 Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises 8.4 Improve progressively, global resource efficiency in consumption and production and endeavor to decouple economic growth from environmental degradation 8.5 Achieve full and productive employment and decent work for all women and men, and equal pay for work of equal value 8.7 Take immediate and effective measures to eradicate forced labor, end modern slavery and human trafficking and secure the prohibition and elimination of the worst forms of child labor 8.8 Protect labor rights and promote safe and secure working environments for all workers
9	9.4 Upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes
10	10.3 Ensure equal opportunity and reduce inequalities of outcome 10.4 Adopt policies, especially fiscal, wage and social protection policies, and progressively achieve greater equality

SDGs	SDGs Target indicators
11	11.2 Provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport 11.c Support least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings utilizing local materials
12	12.5 Substantially reduce waste generation through prevention, reduction, recycling and reuse 12.6 Encourage companies to adopt sustainable practices and to integrate sustainability information into their reporting cycle
13	13.2 Integrate climate change measures into national policies, strategies and planning 13.b Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries
14	14.1 Prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities
15	15.5 Take urgent and significant action to reduce the degradation of natural habitats
16	16.5 Substantially reduce corruption and bribery in all their forms 16.b Promote and enforce non-discriminatory laws and policies for sustainable development
17	17.14 Enhance policy coherence for sustainable development 17.16 Enhance the global partnership for sustainable development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources 17.17 Encourage and promote effective public, public-private and civil society partnerships

Within the circular economy strategy, it is defined that Schneider circular practices relate to using fewer natural resources, including water; this aligns to target indicators 6.4, 8.4, 13.2, 14.1, and 15.5. Furthermore, zero waste to landfill and using material from recycled or certified sources supports target indicators 9.4, 12.5, and 12.6. One of the focus targets for a circular economy is target 17. However, it is not relevant as target 17 is more to support partnerships with developing countries, which Schneider did not show a solid statement to support.

Health and equity strategy contribute to target indicator 3.8 because Schneider provides their employees access to medical coverage and employee eligible dependents. In addition, the gender pay equity relates to target indicators 5.1, 8.5, and 10.4 as the measurement of pay equity is evaluated. Schneider has stated to link SDG 16 with its health and equity. However, SDG 16 target indicator is less relevant for the health and equity strategy because it focuses on employee health and wellbeing and not governance and workplace equality, which is more relevant in the ethics strategy. Likewise, SDG 17 is also less relevant because the internal and external partnership is not shown.

The ethics strategy is identified to the scope of Schneider business and suppliers. Schneider mentioned supporting SDG 1 within the ethics strategy, but no program or initiatives indicated in supporting poverty, so SDG 1 is not well connected. Schneider's sites are shown to be applicable for target indicators 3.8, 3.9, 6.3, 12.5, and 8.8 because ISO 26000 is applied within the suppliers that focus on safety risks, labor, and environmental pollution. Health and safety are applied through emergency procedures and medical responses to prevent safety risks. The labor standards reflect on the working time and human rights, including child labor. In addition to human rights, the whistleblowing procedure for corruption, human trafficking, health and safety, and environmental pollution issues contributes to target indicators 8.7, 16.b, and 17.4. Implementation of anti-corruption also relates to target indicator 16.5. Environmental and management are put in place to overcome insufficient waste management and pollution prevention systems. SDG 14 is not related to Schneider environmental prevention because the site's prevention focuses on carbon emissions and waste, which does not reduce marine pollution. SDG 5 and SDG 10 are not closely connected to the ethics strategy. The programs did not explicitly consider gender equality and reduce inequality as suggested in the health and equity strategy.

Development strategy is designated as economic development of local communities through access to energy and energy poverty. The partnership program with civil society organizations in Africa provides power plants for agriculture, heat irrigation supply, and fish farming activities, contributing to target indicators 1.4, 7.1, and 17.6. The volunteering program in local communities supports access to food, education, and health. This includes providing power supply to medical equipment and electricity for livelihood to reduce energy poverty, which connects to target indicators 2.3 and 3.b. Training and entrepreneurship stipulated in the programs support raising workforce quality and capacity-building in the least developed country, which relates to target indicators 4.4, 8.3, and 13.b. On the other hand, there is no relevance to SDG 6, 12, 15 within the programs as the programs are mainly focused on social livelihood and learning development of local communities, not prevention or mitigation of environmental issues. Likewise, SDG 10 is not well connected because the programs support enhancing productivity and do not link to inequality of gender, age, race, or other status.

All and all, based on the 2020 strategy and target focus of Schneider and Signify, both companies prioritize climate and circular economy as a focus area, as shown in Table 6. The difference is that Schneider tends to have their targets more on internal equity and governance, where half of the overall objectives relate to employee circumstances and treatment in the workplace. In contrast, Signify links its target more to the sustainability of its products as the program tends to increase human wellbeing with increasing food, safety, and health. Thus, even though Signify has more strategy areas, Schneider has more objective programs developed.

Table 6 2020 Strategy and target focus

Schneider	Signify
Climate	Climate action
Circular economy	Circular economy
Development	Food availability
Health & equity	Safety & security
Ethics	Health & wellbeing
	Workplace

Source: (Schneider, 2019, p.86) & (Signify, 2020, p.15)

Sustainable value

Hart (2006) describes that there are four sustainable strategies of pollution prevention product stewardship, clean technology, and sustainability vision. Referring to that concept, I analyze the sustainability activities of Signify and Schneider. Signify implements a pollution prevention strategy within its performance for carbon footprint reduction and the emission reduction of suppliers. As of September 2020, Signify is verified as carbon neutral in its operations, proving its efforts to reduce its carbon footprint. Being carbon neutral is a good step ahead because not many companies have become carbon neutral. In addition, Signify has applied a circularity approach to recycle 91% of waste and aims to go zero waste to landfill, which reduces waste pollution of the end product. Signify still has products containing plastics and aims to phase out plastics by the end of 2021 to reduce plastic pollution. Nevertheless, they have shown progress in minimizing plastic pollution by reducing plastic in their consumer packaging, where more than 80% of materials are from certified renewable sources. However, this does not indicate the other plastic materials used within their operations as it is only indicated to minimize plastics in the packaging. Product stewardship strategy is demonstrated by the implementation of the quality management system that complies with ISO 9001. Safety requirements are in place to prevent defective products, so only safe products will be distributed. Therefore, the action includes product recall if there is a case concerning an individual. Additionally, all substances and components of Signify product comply with Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH) regulation and Restriction of Hazardous Substances (RoHS) regulation to ensure the safe substance of the product. Chemical usage in Signify manufacturing sites is continuously monitored, and for over a decade, Signify has phased out several hazardous substances, including the contents in lighting. Signify's clean technology value is implemented by providing products with energy efficiency such as solar and LED lights that reduce the use of fossil fuels. Solar lighting is also distributed for refugee camps and lower-income groups in Africa to provide clean lighting access. Also, Signify partnered with Climate Group EV100 to operate electric vehicles as an alternative for transportation in contributing to emitting fewer carbon emissions which can be indicated as clean technology. Furthermore, Signify use 100%

renewable electricity, which is electricity usage from renewable resources. Regarding the sustainability vision, Signify has a 5-year roadmap that describes the projection of the sustainability stances of the company to foster sustainable growth for the upcoming years. The roadmap states to increase the circularity of products, women in leadership, carbon emission reductions, and the value of their products to impact society by providing food availability, safety and security, and health and well-being.

Schneider has value within pollution prevention by putting efforts into carbon emission reduction, minimize water pollution and soil pollution. The carbon emission reduction includes the scope of their operations and transportation of suppliers. Efforts for energy efficiency in transportation covers air and sea transport. Water and soil pollution is mitigated by monitoring spills or discharge in water and soil, and as part of ISO 14001, manufacturing sites are monitored for potential pollutions. Water treatment is applied to industrial water discharge to reduce potential pollutants. In addition, minimizing waste is implemented as the sites are increasing to shift to zero waste to landfill by reducing and reusing resources. Furthermore, 99% of pallets and cardboards materials for transport packaging come from recycled or certified sources which are considered circular resources. The value of product stewardship is demonstrated in Schneider Green Premium program, which provides transparency of the information on products that consists of environmental claims and external recognition. The product environmental information complies with regulations on environmental disclosure and on circularity profiles such as REACH declaration, RoHS, Product Environment Profile, and Circular End-of-Life. In addition, a program of take back claim involves a circular value such as collecting end of usable life batteries globally for recycling. Schneider recently launched its own circular certified label, which demonstrates its dedication to selling products that are in line with the circular economy strategy. However, the label is currently only available in the French market and is planned to be deployed more widely. Regarding to clean technology, Schneider has shown effort in using renewable electricity. Schneider also is a member of the EV100 in committing its transition to electric vehicles in support of reducing their transportation emissions. Moreover, Schneider provides renewable energy access to people worldwide. Schneider's roadmap shows a sustainability vision in an effort to reduce carbon emissions until 2050. This demonstrates the consideration to align with the 1.5°C scenarios. Not many companies have provided a roadmap until 2050 as many companies are still in progress to define a roadmap or only have considered a 5-year roadmap. Therefore, Schneider has provided a visionary trajectory for its efforts. In addition, Schneider has a biodiversity pledge to commit to no net biodiversity loss by 2030, including preserving and restoring resources and ecological diversity. This has shown Schneider has high consideration towards biodiversity as not many companies pledge to biodiversity.

In line with the sub-question, the sustainability activity of Schneider and Signify mostly shows actual influence and benefit to the environment and society. With many programs developed, Schneider incorporates their strategies to all the 17 SDGs. Signify has fewer programs which

makes the SDGs contribution of Signify more focused on only its significant impacts. However, both companies did not disclose how they contributed to each of the SDGs. Hence, I identified some indicators that are related and not related to the disclosed SDGs. As a result, Signify has contributed to more SDGs than they stated. On the other hand, Schneider was identified to have some indicators unrelated to what is disclosed but still contribute to more SDG indicators than Signify. One key learning for companies is to be more transparent and inform how they contribute to the SDGs so others, especially the stakeholders, can better understand the contribution.

Based on the sustainability transparency, the sustainability information is mainly targeted for their stakeholder group. Within both companies reporting, the stakeholder groups comprise society, investors, governments, and suppliers. As society is also a priority in the targeted stakeholder, it shows the companies consider investors' perspectives and the concerns of society. The sustainability elements are transparent to unfold the environment, social, and governance topics. For example, the sustainability for customers in a lighting product has high electricity efficiency and a level of brightness that is better for eye health. The main reason to disclose sustainability transparency is to comply with regulations and gain attempts to provide support to the environment and society. Many regulations comply and the process of production and the end result also applies sustainability. For instance, solar lighting and energy management systems support energy efficiency, which helps society have cleaner energy efficiency.

Regarding traceability, both companies have undergone reporting, auditing, and verification procedure with third parties. The auditing and verification procedure examines the process of establishing the data. Therefore, the sustainability statements that are disclosed are evaluated to see if the data is valid. In contrast, digitalization and technologies have help in their sustainability activity to consider resource on developing products and solution. For example, in reaching decarbonization target and develop sustainability portfolio. However, transparency of digitalized visibility in sharing information in real time is not yet shown.

In addition, the rationales of transparency of Gupta (2020) can be linked. Both Signify and Schneider apply democratization rationales as it intends to enhance procedural aims of disclosing and participation. This is shown as both companies disclose their sustainability information based on the standards that are available. Hence, standards have a significant influence on guiding companies. Also, being a member and creating pledges in international organizations proves that both companies participate in supporting sustainability. As an example, by becoming a member of OECD, the company set targets will not only be monitored by the companies themselves. Another rationale is the privatization rationale. In this case, it is seen that the actual calculation of carbon emission is not disclosed and only mention that the reduction is from its operations. Hence, it is not publicly shown what scope of the operations is included and excluded.

4.3 What challenges exist in sustainability performance and how can they be improved?

By the end of 2020, Signify exceeds most of its targets, as shown in Table 7. However, two targets have not been achieved. Signify disclosed that the waste in the manufacturing site is in progress to achieve zero waste to landfill. Currently, efforts of waste segregation and optimization of waste processed is continued to be carried out. The performance of people supported with technical and business skills target is not reached due to the COVID-19 restriction, which resulted in the postponement of training activities. In addition to the sustainability performance of Signify, Signify announced the achievement of becoming carbon neutral in their operations and shifting to 100% renewable electricity in September 2020. Referring to greenhouse gas emissions, Signify had a 55% reduction of scope 1 and 2 GHG emissions and 47% reduction of scope 3 GSG emissions from the use of sold products. Another increase of performance is their score of employee engagement satisfaction of 25, with 37,926 Employees (full-time equivalent), which is an increase in last year's engagement score.

Table 7 Signify performance

SDG contribution	Performance	2020 target	2020 achievement
3, 7, 11	Sustainable revenues	80%	84.1%
7	LED lamps and luminaires delivered	>2 billion	2.923 billion
7	Renewable electricity	100%	100%
12	Waste to landfill for manufacturing sites	Zero waste	91% recycled
8	Safe and healthy workplace with a TRC	<0.35	0.22
8	Sustainable supply chain	90%	99%
8	Women in leadership	25% (by 2022)	23%
13	Carbon footprint (gross, kilotons)	350	260
13	Carbon footprint (net, kilotons)	0	0 or carbon neutral
3, 11	Live lit	5 million	6 million
8	People supported with technical and business skills	10,000	9,266
13	Suppliers reporting on scope 1 and 2 emissions	250	257
13	Suppliers reporting on emission reduction	200	296

Source: Signify, 2020, p. 14 & 30

In contrast to Signify, at the end of 2020, Schneider's sustainability impact performance score is 9.3/10. Most of the Schneider indicators are achieved, as presented in Table 8. However, out of 21 indicators, eight indicators are not achieved. For example, Schneider improves CO₂

efficiency in transportation by optimizing transport footprint and piloting advanced low-carbon transportation technologies such as electric vehicles. There is no explicit explanation for the increase in turnover for Contribute Energy & Sustainability Services targets. Also, cardboard and pallets efforts are still under study to increase the lifecycle of pallets and reduce purchasing additional ones. Another unachievable performance is that the employee engagement target was not achieved by 1% but was the most significant increase since 2012 with 55%. The transparency, collaborative action, and proactive response to COVID-19 played a significant factor for increasing, so more engagement is needed to improve. Furthermore, the platform for digital learning is available, but the targets are not reached. This includes the target for the mandatory anti-corruption e-learning is mandatory. In addition, the pandemic impacted the underprivileged training, where face-to-face training was not able to take place.

Table 8 Schneider performance

SDG contribution	Performance	2020 target	2020 achievement
Climate 7, 9, 11, 12, 13, 17	Renewable electricity	80%	80%
	CO ₂ efficiency in transportation	10%	8.4%
	Million metric tons CO ₂ saved on customer end	120	134
	Increase in turnover for EcoStruxure Energy & Sustainability Services	25%	17.6%
Circular economy 6, 8, 9, 12, 13, 14, 15, 17	Sales under new Green Premium program	75%	76.7%
	Sites labeled toward zero waste to landfill	200	206
	Cardboard and pallets for transport packaging from recycled or certified sources	100%	99%
	Metric tons of avoided primary resource consumption through ECOFIT, recycling, and take-back programs	120,000	157,588
Health & equity 3, 5, 8, 10, 16, 17	Scored in our Employee Engagement Index	70%	69%
	Metrics incidents per million hours worked	0.88	0.58
	Employees have access to a comprehensive well-being at work program	90%	90%
	Employees are working in countries that have fully deployed Family leave policy	100%	100%
	Workers receive 15 hours of learning in the year with 30% digital learning	100%	90%
	White-collar workers have individual development plans	90%	92%

SDG contribution	Performance	2020 target	2020 achievement
	Employees are working in a country with commitment and process in place to achieve gender pay equity	95%	99.6%
Ethics 1, 3, 5, 6, 8, 10, 12, 14, 16, 17	Increase in average score of ISO26000 assessment for strategic suppliers	+5.5 pts	+6.3 pts
	Suppliers under Human Rights & Environment vigilance received specific on-site assessment	350	374
	Sales, procurement, and finance employee trained every year on anti-corruption	100%	94%
Development 1, 2, 3, 4, 6, 7, 8, 10, 11, 12, 13, 15, 17	Turnover of Access to energy program	X4	X1.64
	Underprivileged people trained in energy management	400,000	281,737
	Volunteering days	15,000	18,469

Source: (Schneider, 2020, p.84)

Perspectives of external parties

ESG rating agencies are external parties that assess corporate ESG performances based on their own methodology. The known global leader in ESG insights is DJSI and Sustainalytics, which concentrates on sustainability performance with different indicators. DJSI is more focused on general sustainability indicators, while Sustainalytics is more focused on a risk approach of sustainability performance. Both independent parties' approach is more to best-in-class analysis as company ratings can be compared within the peer industry.

Referring to DJSI, Schneider Electric S.E received the gold class category, while Signify N.V. is within the silver class within the electrical components & equipment industry. Signify scored 89 in the environmental aspect, which made it rank 4th out of 18 in their industry group. In addition, the social score is 85 (rank third), and the governance & economic score is 85. On the other hand, Schneider obtained a higher score and ranking with a score of 97 for the environmental aspect, 88 for the social aspect, and 83 for the governance and economic aspect (rank second).

The DJSI scores are based on the ESG performances of the company referring to DJSI methodology. Based on the DJSI ESG score methodology, the governance and economic dimension hold the highest dimension weight of the ESG scores. High exposure to emerging markets and the public sector within the industry can increase the risk of corruption and anti-competitive practices. Therefore, business ethics is important for minimizing risks. Another approach to reducing risk is by monitoring human rights, conflict minerals, and environmental compliance. A strong supply chain management is achieved by a high complex value chain. As

both companies' score is similar, the ranking is nearby but the significant differences are at the environmental dimension as Schneider almost achieved a score of 100.

See Figure 12 for the numeric scale that indicates the company sustainability performance score according to assessment by DJSI. Each company presents a score above 70 in all the indicators, which indicates as a good score. The electrical component & equipment industry plays a role in helping customers achieve carbon reduction goals and energy efficiency (S&P Global, 2021a). Schneider has a higher score in most of the criteria and achieved the highest scores in climate strategy, innovation management, and operational eco-efficiency. Therefore, Schneider's environmental aspect and the social aspect are ranked number 1 within the industry group. Signify scores higher on the code of business conduct and corporate governance. Consequently, Signify governance and economic aspect is ranked number 1 within the industry group. Nevertheless, both companies are shown to be best-in-class sustainability companies in the electrical industry due to a high score.

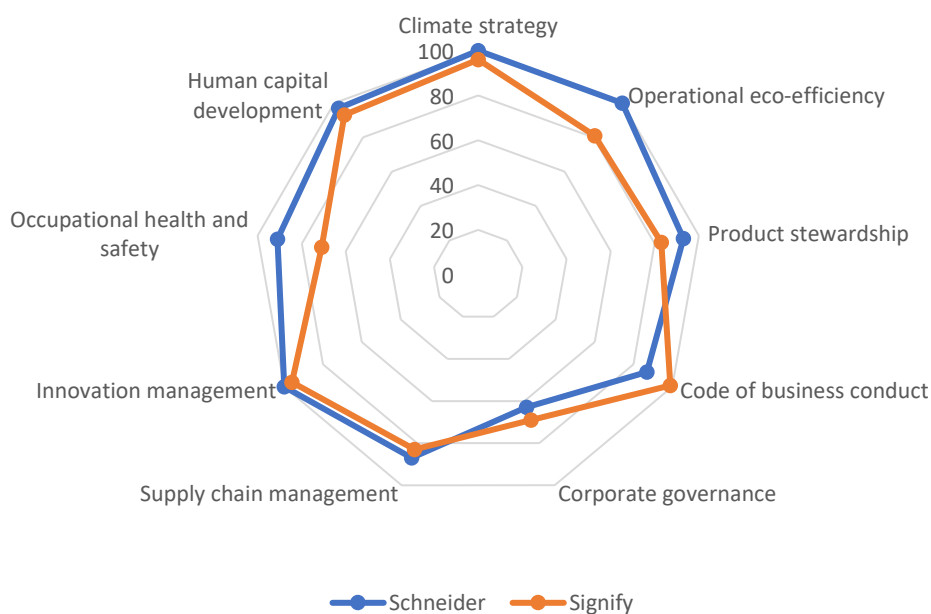


Figure 12 DJSI sustainability performance assessment
 Note. Adapted from (S&P Global, 2021b)

According to Sustainalytics ratings, Signify has an ESG risk score of 13.1, which is categorized as low risk and ranks number 1 of the industry group. The calculation of Signify exposure specifies as medium and the management of ESG material risk is strong. The top material ESG issues that are well managed are corporate governance, business ethics, human capital, and E&S impact of products and services. The highest controversy level that has impacted Signify ESG risk rating in the last three years is low, which is contributed by business ethics incidents in intellectual property. Since the controversy level and the incident event is low, Signify becomes ranked in the industry.

On the other hand, Schneider Electric has an ESG risk score of 17.4, which is categorized as low risk and ranks 8 of the industry group. The assessment stipulates the exposure as medium and the management of ESG material risk is strong. The top material ESG issues for Schneider are corporate governance, product governance, business ethics, and human capital. In the last three years, the highest controversy level is moderate from business ethics incidents in bribery and corruption and business ethics, employee incidents in labor relations, and customer incidents in quality and safety.

As illustrated in Figure 13, the differences of top material topics are that Schneider is better in product governance and Signify in E&S impact of product and services. Product governance emphasizes the company's product quality and safety, which specifies quality management systems, marketing practices, fair billing, and post-sales responsibility. The environmental and social impact of products and services includes the positive and negative characteristics of input materials and impacts during the process of use, disposal, and recycling. In relation to the performance, Schneider applies certification of quality management systems such as ISO 26000 assessments for their suppliers. Conversely, Signify takes into account the impact of products and services as shown in high recycling rate and almost reaching zero waste to landfill.

Schneider	Signify
<ul style="list-style-type: none"> • Corporate governance • Business ethics • Human capital • Product governance 	<ul style="list-style-type: none"> • Corporate governance • Business ethics • Human capital • E&S impact of product and services

Figure 13 Sustainalytics top ESG material assessment
Note. Adapted from (Sustainalytics, 2021)

Based on external recognition of ESG ratings, both Signify and Schneider are top ESG ratings and considered leaders, as shown in Table 9. CDP A list is a collection of companies that are leading on environmental transparency and climate action (CDP, 2020). Both Signify and Schneider are categorized in the CDP climate change A List, demonstrating that both companies' efforts on environmental performances are among the best in the global companies. Signify and Schneider are the top 1% of companies that obtain the Eco Vadis platinum rating for good performances on the environment, labor and human rights, ethics, and sustainable procurement. Another rating by MSCI rated Signify and Schneider as leaders from ESG risks and management abilities perspective. The detailed assessment of MSCI in Signify was not available. However, Schneider has a higher rating of AAA, which excels is assessed leading the industry in managing ESG risks in themes of corporate governance, which includes the impact companies' ownership, boards and compensation practices on investors. Also manage well in the themes of opportunities in clean technology by innovation and strategic development initiatives, and environmental management systems in toxic emissions

and waste. Nevertheless, Schneider still has average scores in the peer industry regarding labor management and corporate behavior, such as fraud and corrupt practices. The results of external recognitions show that both Signify and Schneider have similar ESG rankings and scores within the electrical and equipment component industry. However, Schneider is recognized to have a more comprehensive ESG score and performance.

Table 9 2020 ESG ratings & rankings

ESG ratings & rankings	Schneider	Signify
DJSI	88	86
Sustainalytics	8 out of 177	1 out of 177
CDP	A list	A list
Eco Vadis	Platinum	Platinum
MSCI	AAA (top leader)	AA (leader)

Note. Adapted from Schneider, 2021 (<https://www.se.com/ww/en/about-us/sustainability/>). Signify, 2021, (<https://www.signify.com/global/sustainability/external-recognition>). Sustainalytics, 2021 (<https://www.sustainalytics.com/esg-ratings>)

According to media and global organizations, Signify and Schneider represents a good sustainability performance that benefits the environment and society. Schneider Electric is a global leader in energy-efficient electrical systems that enables to optimize the electrical process and cutting energy consumption on a large scale, which saves money for its customers and results in environmental benefits (M&G Investment, 2021). M&G investment mentioned that the use of Schneider’s technologies had avoided and saved 51 million tons of carbon dioxide emissions by its customers in 2018.

On the contrary, Signify embarks on a new set of environmental goals and also urge environmental guideline into the supply chain (LED Magazine, 2020). News released from United Nations Framework Convention on Climate Change points out that Signify continues to increase energy-efficient products, systems, and services to drive the transition to a low-carbon economy (UNFCCC, 2021). By reducing carbon footprint by more than 70% and transforming all its global market to carbon neutrality, Signify became the 2020 UN Global Climate Action Award winner in the category Climate Neutral Now (UNFCCC, 2020).

Furthermore, Signify programs have delivered significant social, environmental, and economic benefits, such as producing less waste and preserving value with modular design and service models (Australian Circular Economy Hub, 2021). Shifting to lighting as a service from selling light bulbs by Signify is a great example of capturing circular product value (Harvard Business Review, 2021). Customers can save money by only paying for the use of light and not thinking about replacing burnout of bulb and disposal. With this approach, fixtures can have a second and third life (World Economic Forum, 2021). Therefore, it has cost benefits for society, and it reduces discharge to the environment for the planet.

Cooperation between suppliers and operators of systems allows growth (Sustainable Energy for All, 2019). Signify and Smurfit Kappa collaborate to develop sustainable packaging that removes 100% plastic and reduces the material used (Pulpapernews.com, 2021). This solution supports tackling global plastic pollution. The multi-product partnership of Schneider with Rio Tinto develops a circular and sustainable market ecosystem (Business Wire, 2021). The partnership drives decarbonization where Schneider uses responsibly sourced materials by Rio Tinto, and Rio Tinto utilizes energy and industrial services from Schneider to develop digital platforms, technologies across the supply chain.

Data from the World Business Council for Sustainable Development (WBCSD) state that access to energy globally is paradoxical and unfair because about 40% of people do not have reliable access to electricity but have access to electricity sources that are polluted and expensive. On top of that, unprivileged people tend to pay the most for energy (WBCSD, 2012). Market mechanisms must be developed to provide people living with very low incomes with cleaner and better energy options to achieve universal energy access by 2030 (Sustainable Energy for All, 2019). Under Schneider's program of access to electricity offers to meet the energy need of villages without access to electricity in off-grid areas in India (Business Standard, 2019). Schneider's CSR program with access to electricity and solar energy made Schneider receive an honorable mention for its contribution to India's national priority of environment and sustainable development.

The pandemic outbreak has impacted activities worldwide. In the early moment of the pandemic, Signify took measures to significantly curtail indirect material spend, instituting an external hiring freeze, and requesting employees to adopt voluntary work time reduction and sacrifice wage (LEDInside, 2020). To adapt to a long-term economic impact, Signify had to eliminate 600 positions globally (LED Magazine, 2021). In addition, there is a shortage of available components and materials, which affects the supply chain. The pandemic caused Schneider a massive disruption in the global supply chain of manufacturers because of travel restrictions and lockdown and supply issues of components shortage (CGTN, 2020). Both conditions of the companies supply chain and employability have a negative impact that relates to SDG 8 of decent work.

SWOT analysis

I conducted a strength, weakness, opportunities, and threat (SWOT) analysis of the sustainability performances of Schneider and Signify, as presented in Table 10. The results show that the strength for both Signify and Schneider performed beyond their set targets. However, the weakness in both companies still has targets not achieved. The threats of the sustainability performances lie with internal and external factors, especially with the impact of pandemic provides shifting adjustments to cope with sudden challenges, while previous challenges may still be challenging to overcome.

Opportunities for companies with high performance can be leaders in the ESG dimension and inspire others to be more ambitious in supporting the achievement of the Paris Agreement and SDGs.

Table 10 SWOT analysis of Schneider and Signify sustainability performances

Strength	Weakness
<p>Schneider</p> <ul style="list-style-type: none"> • Have more detailed programs related to sustainability. • Have achieved the sustainability performance in <ul style="list-style-type: none"> ○ Renewable electricity ○ Access of well-being to employees ○ Apply Family leave policy in all the company location • Have significant achievements beyond Schneider target: <ul style="list-style-type: none"> ○ Saved CO₂ on customer ○ Green Premium sales ○ Increase number of sites being zero waste to landfill ○ Circularity in avoiding primary resource consumption ○ Low incidents ○ Individual development plans of white-collar workers ○ Gender pay equity ○ Score in ISO26000 assessment ○ Assessment of human rights & environment in suppliers ○ Volunteering <p>Signify</p> <ul style="list-style-type: none"> • Has a more focus strategy with significant performance. • Have less performances that are not achieved. • Have achieved the sustainability performance in <ul style="list-style-type: none"> ○ Renewable electricity 	<p>Schneider</p> <ul style="list-style-type: none"> • Have performances that are not achieved in <ul style="list-style-type: none"> ○ CO₂ efficiency in transportation ○ Energy and sustainability services ○ Recycled packaging or certified material source ○ Employee engagement ○ Employee learning ○ Training on anti-corruption ○ Program to support access to energy ○ Training of underprivileged people <p>Signify</p> <ul style="list-style-type: none"> • Have performances that are not achieved in <ul style="list-style-type: none"> ○ Waste to landfill is not fully zero waste ○ Training for people in the developed area

Strength	Weakness
<ul style="list-style-type: none"> ○ Women in leadership ● Have significant achievements beyond Schneider target: <ul style="list-style-type: none"> ○ Sustainable revenues ○ Amount of LED lamps and luminaires delivered ○ Low incidents ○ Sustainable supply chain ○ Carbon footprint is accounted ○ Signify to be carbon neutral ○ Increase number of lightings distributed to support developed areas ○ Suppliers report on GHG emissions (scope 1, 2, and reduction) 	
Threat	Opportunities
<ul style="list-style-type: none"> ● The unpredictable condition in global business, including the pandemic, made a significant impact on the operation and management of the company. ● Sustainability targets that are not achieved provide lower performance. ● Fewer company commitments to SDGs can be interpreted as a lack of contribution to help achieve the SDGs. 	<ul style="list-style-type: none"> ● Ambitious target in carbon emissions enables to support the Paris Agreement target ● High sustainability performance leads to a good rank in ESG Indices. ● Stakeholders interested in responsible sustainability with high sustainability performances, which can affect to have companies considering sustainability improvement.

It can be seen that improvements are crucially needed in areas of circularity as both companies' waste management is still in the process of reducing waste. Waste is still seen as a challenge to provide even performances in all site locations to reduce waste. As the ambition to reduce waste is already in place, this will require high monitoring and control of the procedures to help minimize waste. Regarding society impacts in supporting to enhance local capabilities and skills, the activity in providing more training and more programs are also needed, especially with the effect pandemic condition. Concerning a decent workplace in SDG 8, the companies must carefully consider the vulnerability risk of people to prevent termination of employment. With the pandemic, provides insights that some approaches have to be restructured so that the sustainability implementation does not experience setbacks and can still be in line with the planned development.

4.4 What is the current staging of the company's sustainability implementation?

Referring to the concept of weak and strong sustainability, Signify and Schneider can be identified as weak sustainability because both companies still demonstrate to substitute natural capital with human-made capital. For example, carbon offsets are in place to help balance human-made capital. However, there are some implementations in both companies that try to preserve natural resources, such as considering the materials of production to minimize the exploitation of natural resources. In addition, both companies' fundamental change is seen as necessary and takes into consideration of the environment and socio-economic well-being and equity in their sustainability strategy. In the environmental aspect, both companies prioritize reducing significant carbon emissions in their operations and have pledged in the Climate Pledge initiative to continually decrease carbon emissions to help fasten the Paris Agreement target. Moreover, the circular economy implements modifying materials to minimize impact to the environment by recycling and shifting to zero waste to landfill. The application of advancing technology is presented in both companies by having renewable electricity in the operations. In the social aspect, employee and supplier well-being are highly considered human rights, safety, and health are monitored and assessed or audited regularly. Several regulations and policies updated at the local and global level have complied related to sustainability, human rights, and others. The impact on customers is also considered, where the products sold can avoid carbon emission and be responsible products such as reducing the use of plastics in packaging. It shows that both profit and people matter.

Based on Landrum (2018) concept of sustainability spectrum, both Signify and Schneider can be seen as a systemic stage by looking externally in defining sustainability by integrating environmental, social, and economic realms to improve humanity. The companies are in the position of being economic science-oriented and business-oriented since anthropocentric views are still visible of nature-based being managed and controlled but efforts to do more good activity. Partnerships are seen with other organizations such as the business and community, but there continue to pursuit increased growth, production, and consumption orientation. Resource exploitation and eco-efficiency attempts are shown, but efforts to continually decrease carbon emissions and minimize impact in the short-term and long-term environment are also shown. Furthermore, the performance in the environmental aspect is significant as Signify is carbon neutral and applies 100% renewable electricity, while Schneider minimizes a large number of resources and achieves 80% renewable electricity.

Both companies are not to be categorized as strong sustainability because it has not looked beyond growth and consumption and is not oriented towards restoring and regenerating nature. Therefore, both companies are still related to the systemic stage as their activities have exceeded the description of weak sustainability, but they do not meet the description

of strong sustainability. In other terms, this is called an intermediate position along the sustainability spectrum.

5 Conclusion

This chapter describes the conclusion and reflections of the research. First, the main research question of *“How do the sustainability strategy of Schneider Electric and Signify influence and improve their sustainability performance?”* is answered. Then the reflection and restrictions of this research will be provided.

5.1 Conclusions and discussion

As previously mentioned, the UN and Paris Agreement have recommended that all stakeholders, including private sectors, contribute to achieving the global targets. This research shows that electrical companies such as Signify and Schneider have implemented several approaches in achieving these targets. Signify and Schneider have committed to supporting sustainability through their strategy and compliance with regulations related to ESG. Both companies have several elements in compliance with the global goals in terms of standards and framework implementation. This has proven that they have met the required standards and indicates that they have a good implementation. In addition, Signify states in contributing to the impact on six SDGs within the strategy. However, as I analyzed, more SDGs impact was identified as contributing to more SDGs target indicators. In contrast, Schneider mentioned contributing to several SDGs within each strategy, but certain SDGs were not well relevant to the impact in the strategy. However, Schneider was identified to have more contribution in the target indicators than Signify due to implementing more sustainability programs. Therefore, it is indicated that not all disclosed information of the companies is proven to be precise as there might be other indications that are implemented but not disclosed and vice versa.

Standards and regulations have played a significant influence on the strategy and performance of companies. The companies are complying to show their contribution to the global goals. Although the standards that are used between the companies are the same, the execution and sustainability strategies applied are different. Hence, standards have been shown to help and advise what sustainability implementation should be considered, but the sustainability activity depends on the company. In addition to sustainability strategy and performance, organizations must take ambitious and valuable applications within the sustainability activities to encourage exemplary implementation and development. Therefore, the sustainability transparency should not only focus to provide any information about sustainability but also empower to participate more effectively in sustainability-oriented decision-making.

Overall, the strategies and targets that Signify and Schneider have set have an impact on their performances. The strategy and targets enable to guide the direction of the company towards sustainability. Signify and Schneider have demonstrated to make a strong commitment to sustainability in its operations that align with the Paris Agreement target and Sustainable

Development Goals. Schneider has demonstrated a high performance as it continues to be a top sustainability leader in its industry. Even though Signify can be counted as a starting company that was established in 2016, Signify has proven to have the ambition to help achieve the global targets with recognizable high performance.

Referring to the research hypothesis, a strong sustainability strategy and target can influence a high sustainability performance and create quality sustainability recognition. Both companies have presented a good performance with strategies aligning to the global targets, and many of the performances have better application than the global conditions. Several recognitions were also given for their sustainability performance and both companies have made several contributions to the global targets. Therefore, having a strong sustainability strategy is essential to gain better sustainability performance. However, both companies still have room for development in bringing more efforts and programs to give additional impact and help the progress gap. Considering the performance of Signify and Schneider, both companies can be an example of best practices or role models for private industries to contribute significantly to achieving the global targets. With that being said, both Signify and Schneider is considered in a systemic stage, where weak sustainability is applied with exceeding some expectations, but strong sustainability activity is not displayed.

COVID-19 pandemic has affected a setback for sustainable development (Sachs, Kroll, Lafortune, Fuller, & Woelm, 2021). The coronavirus pandemic has displayed consequences to businesses and society alike, creating the greatest recession (JP Morgan, 2020). The pandemic has undermined the global economy, plunging even the most prosperous countries into recession (S&P Global, 2020). Governments and organizations across the globe prioritization are primarily to address the suppression of the pandemic through paramedical intervention and access to vaccines. Therefore, several fundings are re-allocated to help with this condition. COVID-19 is a reminder that businesses must work in harmony with the planet and continue to commit to ESG for positive returns and long-term impact on society, the environment, and business performance (World Economic Forum, 2021). The ESG theme will continue to rise, where business leaders want to preserve and build on their organization's sustainability and ESG achievements during a crisis (KPMG, 2021). At the same time, government and regulators are increasing great importance to ESG policy regulations and guidelines (Ruan & Liu, 2021). As can be seen, ESG strategies have gained popularity worldwide (Díaz, Ibrushi, & Zhao, 2021). Since the end of the pandemic is unpredictable, businesses will need to recognize the importance of inclusive purpose and values as a guide in decision-making through uncertainty (KPMG, 2021).

Despite the adverse effects of the pandemic impacting every sector and organization, Signify and Schneider have maintained a good sustainability performance. Both Signify and Schneider have to make a strong commitment to sustainability in their operations that align with the Paris Agreement target. Schneider has demonstrated a high performance as it continues to be a top sustainability leader in its industry. Even though Signify can be counted as a starting

company that was established in 2016, Signify has proven to have the ambition to help achieve the global targets with recognizable high performance. Both companies have made several contributions to SDG, but extra efforts and programs can be developed to give additional impact and help the progress gap.

The improvement of private companies to be more sustainable can be made by having companies disclose the sustainability statements more transparent and meaningful by providing more explanation and reasons on their targets and achievements. Furthermore, complying with various regulations and standards shows the company can keep up with the developments and provide evidence in applying positive impact to the environment and society. Several recommendations can be addressed in the private sector to help reach the global climate. This includes considering the internal and external business processes and life cycles, continually developing and supporting appropriate sustainability approaches, updating the regulatory framework, forming collaboration towards sustainability to facilitate learning development growth, and applying technology and innovation to sustainability efforts (Alkhani, 2020).

5.2 Limitations and recommendations

Limitation

During the pandemic period, there were several limitations and obstacles in carrying out the thesis. While writing the thesis, there are challenges in obtaining participants for the questionnaires. Several institutions were contacted to participate in a questionnaire in this thesis. However, many organizations replied and declared they could not participate, and more information could not be achieved because no representatives were available. The pandemic has impacted the institutions' organizational structure that limited the availability of relevant workers for the research topic. Hence, it was difficult to get respondents in the pandemic era. This condition can be a reflection for the future to consider the availability of respondents.

Initially, in the preparation of the thesis, there was a setback on the theme that was equated with a discussed and agreed internship project. However, over time close to the starting month of the internship, the previous company stated it could not proceed because of the corona case. Therefore, the internship was canceled, and a new thesis theme had to be conducted. I did not continue with the initial thesis theme since it was specific to a project, where it requires specific data of the organization. Hence, I had to change my thesis theme, which was not in accordance with my first thesis proposal. Determining a new topic was not immediately accessible because there were considerations that had to be made. However, I finally chose my research topic as the global goals target is getting close. This research enables to see how the current conditions are with the strategies and performance of companies.

Practical recommendation

The findings of this research can provide an insight to practitioners on the strategies and performances efforts to help contribute to the global goals. It is important to implement sustainability activities that are aligned with the standards and regulations available. In addition, the strategies and targets applied should be ambitious as they can encourage organizations to go beyond compliance. Partnerships and collaborations are an example of gaining sustainability initiatives as they can benefit a wider group of society. Furthermore, being bold to take the initiative to join pledges is also an effort to advance sustainability activity because both internal and external parties pay more attention to monitoring and evaluation of sustainability.

Future research

This research has focused on the private sector's strategy and performance, particularly in the case of Signify and Schneider. A recommendation for possible future research may highlight the critical role of other stakeholders or existing collaborations, including central governments and local communities, which can display a different perspective and approach of the sustainability activity towards the global targets. Hence, further research is needed to analyze the national climate commitments and explore the possibility of a transformational change. Another possible research can also examine the role of private sectors in different industries, not only in the electrical industry. This allows a comparison of how each sector addresses its sustainability commitment and recognizes the different challenges each sector has.

For potential future research, it is relevant to extend other research after the pandemic era so that the data and information will be more available. As the absence of respondents causes the analysis to rely on publicly available sources, future research can explore to include questionnaires or interviews, so the analysis could establish a broader perspective and insights. In addition, due to the time, the scope of the research is limited. Therefore, there can be a broader in investigating the sustainability activity from a more extended period and looking through the early SDG implementation condition.

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