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Sustainability Success Factors in Global Supply Chain

Exploratory multi-case study

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ABSTRACT :
Sustainability has become a strategic necessity for companies because of stakeholders increasing expectations and sustainability regulatory requirements. This thesis researches the sustainability success factors of Smart Power's suppliers within the global supply chain. The study aims to identify key sustainability success factors, understand the benefits suppliers gain from sustainability investments, and determine how Smart Power can support its suppliers' sustainability path. Previous research in sustainable supply chain management (SSCM) and frameworks such as the United Nations Sustainable Development Goals (SDGs), Science-Based Targets, and EcoVadis form the theoretical foundation for this study.

The research is an exploratory multi-case study with a mixed-methods approach, incorporating quantitative data from EcoVadis scorecards and qualitative data from semi-structured interviews with Smart Power's top 10 rated suppliers. 17 key success factors across environmental, social, and governance dimensions were identified. Environmental factors include for example, ISO 14001 certification and the use of green energy, while social factors emphasize policies on labor rights and health and safety. Governance factors highlight the importance of anti-corruption policies and regular supplier assessments.

Suppliers reported significant benefits derived from their sustainability investments. Benefits include reductions in greenhouse gas emissions, cost savings, enhanced brand reputation, and improved operational efficiency. In addition, findings highlighted the necessity for collaboration, training, and economic support from Smart Power to assist suppliers in overcoming sustainability challenges and improving their sustainability performance.

Based on the findings, a sustainability framework for suppliers is develop in order to help them improve their sustainability performance and gain identified benefits. Suggestions for Smart Power include concrete recommendations to support their suppliers effectively. This collaborative approach is crucial for improving the overall sustainability performance of Smart Power's supply chain and contributing to a more sustainable and resource-efficient future.

KEYWORDS: global supply chain, sustainable supply chain management, sustainability success factors, sustainability performance, sustainability initiatives, supplier sustainability

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TIIVISTELMÄ :
Kestävästä kehityksestä on tullut yrityksille strateginen välttämättömyys sidosryhmien kasvavien odotusten ja kestävän kehityksen sääntelyvaatimusten vuoksi. Tässä pro gradussa tutkitaan Smart Powerin toimittajien kestävän kehityksen menestystekijöitä globaalissa toimitusketjussa. Tutkimuksen tavoitteena on tunnistaa keskeiset kestävän kehityksen menestystekijät, ymmärtää, mitä hyötyjä toimittajat saavat kestävän kehityksen investoinneista, ja selvittää, miten Smart Power voi tukea toimittajiensa kestävän kehityksen matkaa. Kestävän toimitusketjun hallinnan (SSCM) aiempi tutkimus ja viitekehykset, kuten YK:n kestävän kehityksen tavoitteet, sCience-Based Targets ja EcoVadis muodostavat teoreettisen perustan tälle tutkimukselle.

Tutkimus on eksploratiivinen monitapaustutkimus, jossa hyödynnetään monimenetelmällistä lähestymistapaa ja joka sisältää kvantitatiivista tietoa EcoVadis arvioinneista ja kvalitatiivista tietoa teemahaastatteluista Smart Powerin kymmenen parhaiten arvoidun toimittajan kanssa. 17 keskeistä menestystekijää kestävän kehityksen ympäristö-, sosiaali- ja hallintokategorioissa tunnistettiin. Ympäristötekijöitä ovat esimerkiksi ISO 14001 -sertifiointi ja vihreän energian käyttö, kun taas sosiaaliset tekijät korostavat työntekijöiden oikeuksia sekä terveyttä ja turvallisuutta. Hallinnolliset tekijät korostavat korruption vastaisen politiikan ja tavarantoimittajien säännöllisten arviointien merkitystä.

Tavarantoimittajat raportoivat saavuttaneensa merkittäviä hyötyjä kestävän kehityksen investoinneistaan. Hyötyihin kuuluvat kasvihuonekaasupäästöjen vähentäminen, kustannussäästöt, brändin maineen kehittäminen ja toiminnan tehostaminen. Lisäksi löydökset korostivat yhteistyön, koulutuksen ja taloudellisen tuen välttämättömyyttä Smart Powerilta, jotka auttavat tavarantoimittajia kestävän kehityksen haasteiden kohtaamisessa ja heidän kestävän kehityksen suorituskyvyn parantamisessa.

Tulosten perusteella kehitetään toimittajille kestävän kehityksen viitekehys, jonka avulla he voivat edistää kestävän kehityksen suorituskykyään ja saavuttaa tässä tutkimuksessa tunnistettuja hyötyjä. Suositukset Smart Powerille sisältävät konkreettisia suosituksia tavarantoimittajiensa theokkaaseen tukemiseen. Tämä yhteistyöhön perustuva lähestymistapa on ratkaisevan tärkeä Smart Powerin toimitusketjun kestävän kehityksen suorituskyvyn parantamiseksi ja kestävämmän sekä resurssitehokkaamman tulevaisuuden edistämiseksi.

AVAINSANAT: globaali toimitusketju, kestävä toimitusketjun hallinta, kestävän kehityksen menestystekijät, kestävän kehityksen suorituskyky, kestävän kehityksen aloitteet, toimittajan kestävä kehitys

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1 Introduction

This chapter presents background of the study, purpose of the study including research questions and objectives, presentation of the target company and its sustainability agenda, limitations, and structure of the thesis. The topics are covered in the presented order. Background of the study presents the motivation behind this research. Purpose of the study covers research aims, objectives, and questions. Target organization and its sustainability strategy are presented in chapter 1.3. Limitations of the research are listed in chapter 1.4. Lastly, chapter 1.5 presents the structure of the thesis.

1.1 Background of the study

The interest and necessity of sustainability and sustainable development are increasingly recognized. The rapid industrial growth in recent decades has created challenges for environmental and social well-being (Rajeev et al., 2017). These challenges will threaten human conditions for future generations and the existence of future on earth if the necessary changes are not made. Solving environmental challenges, such as global warming and scarcity of resources, are only one part of ensuring future life. Social and economic challenges, such as income inequality, must also be addressed.

According to the Brundtland Report sustainable development is defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (World Commission on Environment and Development, 1987). Today’s definitions of sustainability are largely based on that definition. For example, according to Krajewski and Malhotra (2022, p. 631), sustainable development refers to the practices that meet current needs without compromising future needs.

Sustainability has evolved from a moral or ethical obligation to a strategic necessity for companies due to the pressure to address the growing sustainability concerns (Joyce &

Paquin, 2016). Companies are increasingly expected to address issues such as economic crises, social inequality, environmental issues, resource scarcity, energy demands, and technological development. Therefore, according to Porter and Derry (2012), companies and management constantly seek ways to balance their environmental, social, and economic performance while also advancing cultural value creation. However, the continuously growing complexity of the world is creating new challenges for sustainability.

Supply chains play an important role in shaping a company's sustainability performance. Over 90 percent of a company's greenhouse gas (GHG) emissions and 50 to 70 percent of a company's operating costs are caused by supply chains (Alves & Stenberg, 2022). Besides environmental and economic effects, supply chains also affect a company's social performance. Integrating sustainability into the core of supply chains enables companies to achieve a good market position (Khodakarami et al., 2015) and gain a competitive advantage (Panigrahi et al., 2019). Therefore, companies should focus on improving their supply chain sustainability.

A company's sustainability performance is dependent on its suppliers as supplier sustainability acts as a resource when aiming to achieve high environmental and social performance standards (Gualandris & Kalchschmidt, 2016). For example, according to Faruk et al. (2001), a company's environmental performance can be decreased by its suppliers' defective environmental management. If suppliers are underperforming, the company can replace them or collaborate to enhance their capabilities (Gualandris & Kalchschmidt, 2016). Through supplier assessment and collaboration with suppliers, companies can advance their environmental, social, and economic performance (Gimenez & Tachizawa, 2012, p. 540).

With a history of over 140 years, ABB Group has established itself as a global leader committed to enabling a more sustainable and resource-efficient future (ABB, n.d. -a). By utilizing its engineering expertise and software solutions, ABB aims to empower in-

dustries to optimize energy consumption, enhance productivity, and mitigate environmental impact. ABB operates in four different business areas. Business areas are Electrification, Motion, Process Automation, and Robotics & Discrete Automation and they are divided into 21 divisions (ABB, n.d. -a). One of the divisions of Electrification business area is Smart Power. This thesis is made as a commission for Smart Power division.

Recognizing the challenges of sustainability, ABB places sustainability at the core of its strategy (ABB, n.d. -a). ABB's sustainability agenda aims to accelerate the transition towards a low-carbon society, preserve natural resources, and promote social progress. The strategy aligns with international frameworks and standards such as the United Nations Sustainable Development Goals (SDGs), Science-Based Targets, and Avoided Emissions.

ABB recognizes the important role of suppliers in sustainability performance. Therefore, this study focuses on the sustainability success factors of Smart Power’s suppliers and the benefits that suppliers have achieved through investing in sustainability. In addition, this study seeks ways in which Smart Power can support its suppliers’ sustainability path. The main aims of the study are to provide guidance on how Smart Power's suppliers can improve their sustainability performance and motivate them to invest in sustainability, which helps suppliers to achieve benefits, but also ABB to achieve its sustainability goals.

Smart Power division was selected for this study as it is piloting the use of EcoVadis, a sustainability assessment platform. ABB chose to use EcoVadis as it provides measurable, comparable, and reliable data which can be also utilized by suppliers in their communications to their own stakeholders. Smart Power utilizes EcoVadis to assess its own sustainability as well as its suppliers. Specifically, Smart Power uses EcoVadis to monitor and reduce its scope 3 carbon footprint. This study examines Smart Power’s top 10 rated suppliers based on EcoVadis assessments, aiming to derive findings that benefit Smart Power and its suppliers and improve their sustainability status.

1.2 Purpose of the study

This thesis researches the sustainability success factors of ABB Smart Power's suppliers in the global supply chain. The aims are to identify the key sustainability success factors of the suppliers, understand how investing in sustainability initiatives benefits suppliers, and determine how Smart Power can support suppliers' sustainability journey. By analyzing the sustainability practices, the benefits gained by suppliers, and the expectations for cooperation and support in global supply chain, this thesis seeks to find ways for improving suppliers' sustainability, thereby advancing the overall sustainability of ABB. Nonetheless, the main aims of the study are to provide guidance how suppliers can improve their sustainability performance and motivate them to invest in sustainability.

The objectives of this study are to:

1. Identify the key success factors of suppliers' sustainability and provide recommendations for suppliers to improve their sustainability performance.
2. Identify the benefits suppliers have derived from sustainability.
3. Provide recommendations for Smart Power how to support its suppliers' sustainability path.

These objectives are addressed by answering the following research questions:

RQ1: What are the suppliers' sustainability success factors?
RQ2: What are the benefits suppliers have derived from investing in sustainability?
RQ3: How can Smart Power support suppliers' sustainability path?

1.3 Target organization

ABB Group is a technology leader in electrification and automation that aims to enable a more sustainable and resource-efficient future (ABB, n.d. -a). ABB has been in the industry over 140 years. The solutions of ABB Group combine engineering knowledge and

software to effect on how things are manufactured, moved, powered, and operated optimally. ABB employs approximately 107 900 people and operates in 85 countries worldwide. The company is structured into four business areas that are Electrification, Process Automation, Motion, and Robotics & Discrete Automation. Business areas include a total of 21 divisions, with five divisions under the Electrification business area: Smart Buildings, Installation Products, Distribution Solutions, Smart Power, and Service.

This master's thesis is commissioned by and conducted in collaboration with the Smart Power division. Smart Power operates in 53 countries and has 31 manufacturing facilities worldwide, employing about 12 600 people (ABB, 2023). Smart Power division consists of six product groups: Breakers & Enclosures, Low Voltage Systems, Power Protection, Switches & Fusegear, Motor Starting & Safety, and NEMA Enclosed Products (ABB, n.d. -f). Smart Power's technologies enable buildings, factories, and transportation to implement smarter energy management, enhance the productivity of renewables, and increase operational resilience (ABB, 2023). With the intelligent solutions, Smart Power improves energy efficiency, productivity, and reliability across a wide range of operations.

1.3.1 Sustainability agenda

Sustainability is strongly linked into ABB's priorities, operating model, and purpose. Among ABB's six priorities - market leadership, technology & digital innovation, people, portfolio management, financial performance, and sustainability - sustainability holds a central place (ABB, 2024b). At ABB sustainability is defined as "progress towards a healthier and more prosperous world for future generations" (ABB, n.d. -l). This definition refers to balancing between the needs of society, environment, and economy. To achieve this balance between society, environment, and economy, ABB acts and embeds the sustainability approach into its business practices across the value chain.

The ABB Way is an operating model of ABB Group, its business areas, and their divisions (ABB, n.d. -l). It acts as a cohesive framework linking ABB's business areas and divisions.

At the core of the ABB Way is the company's purpose: “to enable a more sustainable and resource-efficient future through our technology leadership in electrification and automation” (ABB, n.d. -c). This main purpose is supported by five key objectives: “creating success, addressing the world’s energy challenges, transforming industries, embedding sustainability, and leading with technology” (ABB, 2024b). Through these objectives, ABB aims to enable a more sustainable and resource-efficient future.

ABB Group plays a pivotal role in accelerating the energy transition. This is done by empowering customers to optimize, electrify, and decarbonize their operations, managing how people move, produce, work, and live more sustainable and resource efficient overall (ABB, n.d. -j). ABB Group’s sustainability agenda is designed to support this mission.

The sustainability agenda of ABB Group “aims to enable a low-carbon society, preserve resources, and promote social progress for a net-zero future” (ABB, 2024c). ABB's approach to sustainability includes sustainability reports, policies and documents, integrity and transparency, sustainability governance, stakeholder engagement, materiality, and contributing to the United Nations Sustainable Development Goals (SDGs) (ABB, n.d. -i). The sustainability agenda is aligned with international standards and frameworks, embedding sustainability into ABB’s culture of integrity and transparency. The best-practice standards and guidance ABB uses are Science-Based Net-Zero Targets, Guidance on Avoided Emissions, United Nation’s Sustainable Development Goals, and double materiality assessments (ABB, 2024c).

By taking action across its value chain, ABB **enables a low-carbon society** (ABB, n.d. -b). ABB’s technologies help customers to reduce and avoid emissions and increase the use of renewables. ABB also aims to reduce its own emissions, with targets in line to the Net-Zero Standard of the Science Based Targets initiative (SBTi). The net-zero targets address Scope 1, 2, and 3 greenhouse gas (GHG) emissions. For Scope 1 and 2, ABB aims to reduce GHG emissions by 80 % by 2030 and by 100 % by 2050 compared to a 2019 baseline. For Scope 3, ABB seeks to achieve 25 % reduction by 2030 and 90 % reduction by 2050

compared to a 2022 baseline. Regarding avoided emissions, ABB has aims to enable its customers to avoid 600 megatons of GHG emissions over the lifetime of products sold between 2022 and 2030.

Through circular business models, ABB **preserves resources** for future generations (ABB, n.d. -d). Circular business models reduce and eliminate waste while keeping materials and products in use. ABB has created Circularity Approach to cover different stages of the product life cycle, including circular design and sourcing, resource-efficient operations, optimized use phases, and responsible end-of-life practices. ABB also supports its customers in meeting circularity commitments by offering retrofit, take-back and recycling solutions and services. ABB has set a target to send zero waste to landfill from its own operations by 2030, compatible with local conditions and regulations. Additionally, ABB aims to cover minimum 80 percent of its products and systems with the Circularity Approach.

ABB **promotes social progress** by focusing on occupational health and safety, diversity and inclusion, employee engagement, community engagement, and human rights (ABB, n.d. -e). ABB seeks to zero harm to its employees as well to its contractors, aiming to reduce lost time from incidents. By 2030, ABB has a target to increase the percentage of women in senior management roles to 25 % compared to a 2019 baseline. To promote diversity and inclusion, ABB also offers a global gender-neutral parental leave program. The target related to employee engagement is to achieve a top-tier employee engagement score by 2030. For community engagement, ABB aims to expand programs for community engagement. This combines “strategic corporate partnerships with country-level projects to address local needs” (ABB, n.d. -e).

1.3.2 Business area specific sustainability targets

The sustainability agenda described applies at the group level, meaning that all business areas and their divisions follow this agenda. However, the business areas and their divisions can set their own sustainability strategies and targets, provided they adhere to the group level agenda in ways that are possible for their operations.

Electrification business area, to which Smart Power belongs, has additional targets besides the group level sustainability agenda. These targets also focus on enabling a low-carbon society and preserving resources (ABB, n.d. -k).

1.3.3 Smart Power division's sustainability targets

Smart Power division adheres to both the group-level sustainability agenda and the additional targets set by the Electrification business area. Additionally, Smart Power has set its own additional targets to support these broader agendas. These targets are related to the EcoVadis process and the EcoVadis scorecards of Smart Power's suppliers.

In conclusion, sustainability is deeply integrated into ABB's core priorities and operational framework. Sustainability is essential for progressing towards a healthier and more prosperous world, balancing societal, environmental, and economic needs. ABB's operating model, "The ABB Way," is built around the purpose of enabling a more sustainable and resource-efficient future through technology leadership in electrification and automation (ABB, n.d. -l). ABB is committed to accelerating the energy transition by empowering customers to optimize, electrify, and decarbonize their operations.

1.3.4 Role of the suppliers

One of the six dimensions of ABB's approach to sustainability is stakeholder engagement (ABB, n.d. -g). The key stakeholders of ABB include collaborative partnerships, customers,

employees, governments and civil society, investment community, and suppliers. At ABB, stakeholder engagement includes engaging, interacting, co-developing solutions, and maintaining ongoing communication with the key stakeholders.

ABB recognizes that suppliers have an important role in its operations and overall success. Therefore, ABB values trusting and stable relationships with its suppliers. Engaging with suppliers to ensure adherence to sustainability standards is crucial. ABB's engagement with suppliers includes co-development initiatives, early engagement during new product development, monitoring through ABB's Sustainable Supply Base Management program, on-site evaluations and audits, procurement management, providing training, participating in special projects on sustainability performance, and organizing town halls and supplier day events (ABB, n.d. -g).

ABB's ambitious sustainability strategy and targets has established specific requirements and guidelines for suppliers. These include ABB Supplier Code of Conduct, ABB General Terms and Conditions, Material Compliance, Responsible Minerals, ABB Sustainable Supply Base Management, Program, GDRP for Suppliers, and ABB Supplier Security (ABB, n.d. -h). These requirements are aligned with ABB's sustainability agenda to support its goals to of enabling a low-carbon future, preserving resources, and promoting social progress, including respect for human rights and fair labor standards.

As presented earlier, ABB has set targets to reduce its Scope 3 emissions by 25 % by 2030 and by 90 % by 2050. Scope 3 emissions are indirectly caused by activities within an organization's value chain, such as purchasing products from suppliers (Deloitte, 2024). Usually, Scope 3 emissions cover the largest portion, over 70 percent, of a company's carbon footprint. Since organizations have less control over Scope 3 emissions, suppliers play a crucial role in reducing them. Organizations can improve Scope 3 reductions by collaborating with suppliers or by making changes within the supply chain.

To achieve its reduction targets, ABB is determined to help its tier-one supplier reduce emissions within the supply chain (ABB, 2024a). ABB collects supplier emission data and provides training about GHG protocol, Scope 1, 2 and 3, and reduction strategies. Specifically, Smart Power division requires its 200 most important suppliers to have an EcoVadis scorecard. Out of the 200 suppliers 90 % have filled out EcoVadis survey and now have a scorecard where GHG emissions are reported.

In summary, ABB places significant importance on stakeholder engagement as a key dimension of its sustainability strategy. Suppliers, being critical stakeholders, play an important role in ABB's operations. ABB highly values fostering trusting and stable relationships with them. To ensure suppliers alignment with ABB's sustainability standards, the company has established specific requirements and guidelines for them. These requirements are designed to support ABB's sustainability goals, which include enabling a low-carbon future, resource preservation, and promoting social progress with respect to human rights and fair labour standards.

1.4 Limitations

While this research aims to identify the success factors of Smart Power's suppliers' sustainability, key benefits derived from sustainability investments, and suppliers' expectations for collaboration and support, it is important to acknowledge that certain limitations may impact the scope and generalizability of the findings.

The study focuses on interviewing and analyzing the top 10 ranked suppliers of ABB Smart Power identified through EcoVadis assessments. However, this limited sample size may not fully represent the diversity of suppliers within Smart Power's supply chain.

The study primarily examines suppliers located in regions where Smart Power operates, potentially overlooking suppliers from other geographical areas. As sustainability practices may vary across different regions due to regulatory, cultural, and economic factors,

the findings may not be universally applicable to suppliers outside this study's geographical scope.

Identifying suppliers' sustainability success factors relies on data provided by EcoVadis, which may not capture all relevant sustainability metrics or reflect real-time sustainability practices. Additionally, the availability and accuracy of EcoVadis data for all suppliers may vary, affecting the completeness and reliability of the analysis.

The findings of this study are based on the specific context of Smart Power's supply chain and may not be directly transferable to other organizations or industries. Factors unique to Smart Power's operations, such as its organizational culture, supplier relationships, and industry dynamics, may limit the generalizability of the findings.

The qualitative nature of semi-structured interviews may cause subjectivity and interpretation biases in the analysis of suppliers' sustainability practices, benefits, and expectations for support. While efforts are made to maintain consistency in the interview process, variations in interviewee responses and perspectives may influence the overall conclusions drawn from the qualitative data.

The study's focus on a specific point in time may overlook the dynamic nature of sustainability practices within Smart Power's supply chain. Changes in EcoVadis assessments, regulatory requirements, market conditions, or organizational priorities over time may impact the relevance and applicability of the findings beyond the study period.

1.5 Structure of the thesis

This thesis is structured as follows. Chapter 2 provides a theoretical framework for the study. Chapter 3 presents the method utilized for this research. Results of the research, discussion, and suggestions for suppliers and Smart Power are presented in chapter 4. Lastly, chapter 5 includes conclusions.

2 Theoretical framework

This chapter provides a theoretical framework about sustainable supply chain management (SSCM), SSCM in global supply chains, reasons to invest in sustainability, and sustainability frameworks, standards, and assessments. The topics are covered in presented order. Chapter 2.1 includes subchapters about the definition of SSCM, TBL, supply chain responsibility, and key concepts and theories of SSCM. Chapter 2.4 presents The Agenda 2030, SDGs, Science-Based Targets Initiative, and EcoVadis.

2.1 Sustainable supply chain management

This chapter provides an overview of sustainable supply chain management (SSCM) including the definition of SSCM, triple bottom line (TBL), supply chain responsibility, and other key concepts and theories of SSCM.

2.1.1 Definition of SSCM

SSCM is a tool for companies to improve their efficiency, especially environmental and social performance (Seuring & Muller, 2008). Carter and Rogers (2008) define SSCM as “the strategic, transparent integration and achievement of an organization’s social, environmental, and economic goals in the systemic coordination of key interorganizational business processes for improving the long-term economic performance of the individual company and its supply chains” (p. 368). Seuring and Muller (2008) define SSCM as “the management of material, information, and capital flows as well as cooperation among companies in the supply chain while taking goals from all three dimensions of sustainable development, i.e., economic, environmental and social, into account which are derived from customer and stakeholder requirements” (p. 1799). Both definitions highlight the importance triple bottom-line (TBL) approach in SSCM.

2.1.2 TBL

Economic, environmental, and social dimensions of sustainability are based on triple-bottom-line (TBL) approach. TBL is central for organizational sustainability strategy and operations (Sarkis & Dhavale, 2015). TBL was introduced by Elkington in 1994 (Wilson, 2015, p. 433) and refers to the interaction between social, environmental, and economic dimensions (Murphy & Knemeyer, 2017; Pullman & Sauter, 2012; Wilson, 2015). These dimensions are also known as the three P's (people, planet, profit) (Wilson, 2015). According to Pullman and Sauter (2012) these three dimensions should be balanced to ensure the long-term stability of an organization. The Sustainability Society Foundation (SSI) defines the dimensions of TBL dimensions as follows: the social aspect refers to the well-being of people; the environmental dimension comprehends a healthy environment, climate and energy, and natural resources; and the economic dimension focuses on future and economic preparedness (Shen, 2014, p. 6238). Business sustainability involves managing these dimensions to balance risks, obligations, and opportunities (Dyllick & Muff, 2016).

To describe the TBL approach and its relevancy to SSCM, Wittstruck and Teuteberg created "house of SSCM", which outlines the main components of SSCM and the risks threatening SSCM (Wittstruck & Teuteberg, 2010, p. 143). The house of SSCM describes how environmental, social, and economic dimensions are equal elements of SSCM and highlights the importance of risk and compliance management as the foundation of SSCM. Figure 1 is modified from Wittstruck's and Teuteberg's house of SSCM figure.

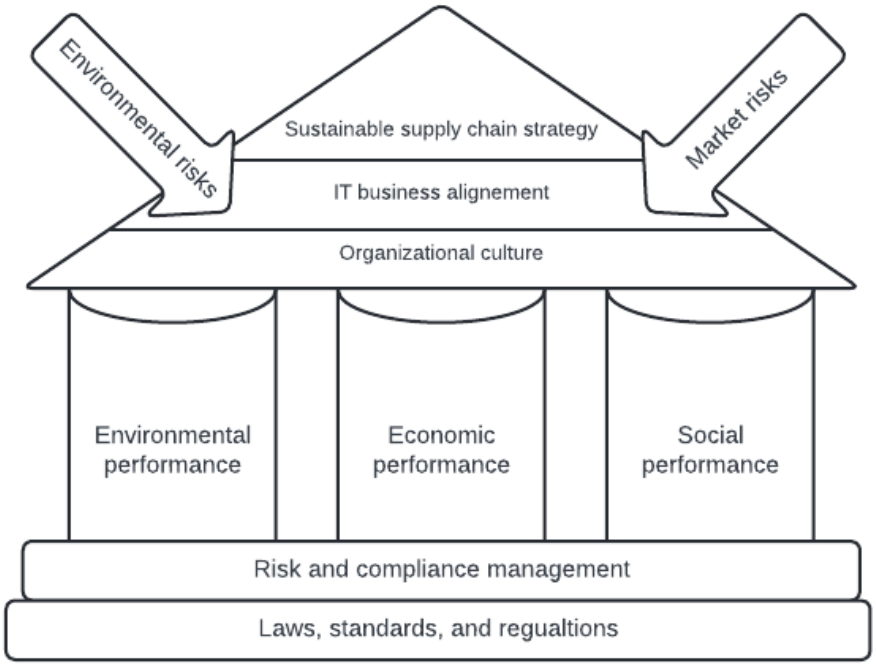

Figure 1. House of SSCM (Wittstruck & Teuteberg, 2012, p. 143).

Carter and Rogers (2008) include risk management, transparency, strategy, and culture as supporting sustainability elements to environmental, social, and economic performance. Contingency planning, supply disruptions, and outbound supply chains are included to risk management. Transparency refers to stakeholder engagement and supplier operations. It is crucial to have sustainability integrated into business strategy. Organizational culture should be deeply ingrained as it includes organizational citizenship and values and ethics. To achieve the best sustainability performance organizations should cover all mentioned elements of SSCM. Figure 2 is modified from Carter and Rogers (2008, p. 369) figure and it presents the sustainability elements and the outcomes of each area.

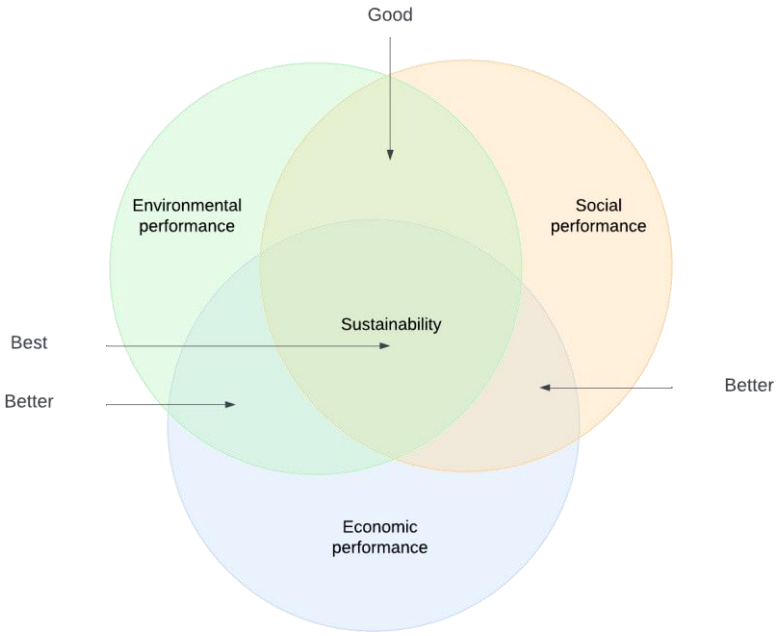

Figure 2. Sustainability elements and outcomes (Carter & Rogers, 2008, p. 369).

Sustainable supply chain management (SSCM) is utilized for improving sustainability of supply chains (Koberg & Longoni, 2019). Wittstruck and Teuteberg (2012) note that SSCM incorporates environmental, social, and ethical dimensions, which traditional supply chain management does not. Nur and Hidayatno (2020, p. 60) state that within sustainable supply chain sustainable growth is pursued by ensuring environmental, economic, and social stability.

2.1.3 Supply chain responsibility

According to Krajewski and Malhotra (2022), supply chain sustainability can be divided into financial, social, and environmental responsibility. Supply chain responsibility includes a commitment to ethical and sustainable practices in every aspect of the supply chain, from sourcing raw materials to delivering end products to customers. Companies should balance these responsibilities with their operational and economic goals to deliver long-term value for both business and society.

2.1.4 Key concepts and theories of SSCM

In addition to previously presented TBL, there are other key concepts and theories strongly related to SSCM. Organizations can utilize these concepts and theories to improve their supply chain sustainability to benefit themselves but also society. Next, resource-based view (RBV), stakeholder theory, and corporate social responsibility (CSR) and their relevance for SSCM are presented briefly as they are connected to this study's case company's sustainability agenda and relevant for any organization who is interested in improving their supply chain sustainability.

2.1.4.1 Resource-based view (RBV)

Touboulic and Walker (2015) researched theories of SSCM and found that resource-based-view (RBV) is one of the key theories in SSCM literature. RBV refers that the sustainable competitive advantage of a company is a consequence of the company's unique resources and capabilities and the utilization of them. According to Barney (1991), there are 3 different types of resources: physical capital resources, human capital resources, and organizational capital resources. A company should focus to identify and analyse internal resources and capabilities when creating a strategy for achieving sustainable competitive advantage (Madhani, 2010).

From RBV perspective, the sustainability competencies within a supply chain advance a company's competitive advantage (Touboulic & Walker, 2015). According to Paulraj (2011), internal capabilities of a company effect on environmental, social, and economic performance. In addition to developing these internal capabilities, companies constantly need to utilize them in identifying strategic partners, collaborating in the strategic partnerships, and constantly assess them to achieve sustainability goals and requirements. This approach can help companies to create beneficial societal relationships, utilize their position in the market in future, and better their social status and reputation.

2.1.4.2 Stakeholder theory

Other key theory of SSCM that Touboulic and Walker (2015) identified, is stakeholder theory. According to Freeman (1984), stakeholder theory contributes to the development of corporate strategy by expanding the range of stakeholders a company should engage with (Fritz, 2022). The main of stakeholder theory is to create value for stakeholders (Schaltegger et al., 2019). Primary stakeholders are customers, employees, investors, and societies (Fritz, 2022). Secondary stakeholders include the government, competitors, consumer ombudsmen, special interest groups, and the media. Each stakeholder should understand sustainability challenges and adopt sustainability thinking. According to Touboulic and Walker (2015), the long-term survival of a company can be ensured by taking a broad network of stakeholders into account.

Stakeholder theory is an important part of a sustainable supply chain and its management, as supply chains constantly become increasingly global and complex, increasing the number of supply chain stakeholders (Fritz, 2022). According to Schaltegger et al. (2019), the sustainability perspective of stakeholder theory is to solve sustainability challenges in way that creates value for all stakeholders. Usually, the sustainability challenges that stakeholder are facing are similar. Therefore, sustainability should be a part of stakeholder management.

2.1.4.3 Corporate social responsibility (CSR)

Corporate social responsibility (CSR) is essential for an organization's sustainability (Li et al., 2022). CSR is a strategic tool by which a company improves its reputation and achieves a competitive advantage. It includes a variety of activities, such as philanthropy, environmental sustainability, employee rights and well-being, and ethical practices within the supply chain and therefore, indicates a company's commitment to sustainability. Organizations that practice social responsibility and adopt sustainable supply chain management practices are seen as reliable and socially responsible.

In conclusion, utilizing concepts and theories, such as TBL, RBV, stakeholder theory, and CSR within SSCM enables companies to improve their sustainability performance, align with social expectations, and gain competitive advantage. These frameworks provide a holistic approach to sustainability management and promote the interests of both the company and society.

2.2 SSCM in global supply chains

Simply stated, global supply chains are supply chains that operate across multiple countries (Koberg & Longoni, 2019). Global supply chains are managed by focal firms that operate in multiple countries, have located facilities abroad, or source from foreign suppliers (Caniato et al., 2013). Choi and Hong (2002) highlight the complexity of global supply chains, which involve multiple companies across various locations and multiple tiers. According to Gereffi and Lee (2014), focal firms seek competitive advantage by sourcing from low-cost suppliers abroad, transforming supply chains into global networks.

Long distances within global supply chains between suppliers and purchasers create challenges for SSCM. While SSCM aims to improve sustainability within supply chains, the sustainability challenges of global supply chains are often very complex due to their extensive and intricate nature (Koberg & Longoni, 2019).

Koberg and Longoni (2019) researched the key elements of SSCM in global supply chains. They identified direct and indirect SSCM governance mechanisms for global supply chains. Direct governance mechanisms are supplier assessments, codes of conduct, and private firm standards, supplier collaboration (for example, training), and multi-stakeholder initiatives. Indirect governance mechanisms are third-party industry-specific certifications (for example, Forest Stewardship Council (FSC)) and third-party multi-industry certifications, such as ISO 14001. These governance mechanisms effect positively to a company's social, environmental, and/or economic performance.

2.3 Reasons to invest in sustainability in global supply chains

Investing in sustainability is essential for companies facing today's business challenges. However, improved sustainability performance will enable companies gain benefits such as competitive advantage, improved financial performance, cost reductions, and enhanced employee engagement. This chapter will present the benefits companies may derive from sustainability investments.

Seeking sustainability is increasingly seen as an effective strategy to address some of the challenges that global supply chains are facing. Pursuing sustainability as a part of strategy improves an organization's competitiveness and financial performance. Moreover, it creates moral capital for the company to mitigate the consequences of potential business risks (Giannakis & Papadopoulos, 2016).

The sustainability regulations have become stricter in recent years and are constantly developing which requires companies to adopt sustainable practices. For example, European Union requires a comprehensive sustainability reporting starting from financial year 2024 which affects listed companies, large companies, listed SMEs, and even some non-EU companies (European Commission, n.d.). In addition to sustainability reporting, European Union has started to require Carbon Border Adjustment Mechanism (CBAM) from CBAM goods that are imported from outside of EU (Tulli, n.d.). CBAM goods are, for example, certain iron and steel goods, iron ore, and electricity. The aims of CBAM are to encourage companies to regulate their emissions and that imported goods' prices reflect their emissions. Complying with the sustainability regulations enables companies to mitigate risks and avoid possible fines or sanctions. According to Camilleri (2017), CSR (corporate social responsibility) activities are seen as long-term investments that yield financial returns and enhance regulatory compliance.

Alshehhi et al. (2018) found that 78 percent of studies report a positive impact of sustainability practices on financial performance. So, there is a positive relationship be-

tween corporate sustainability practices and financial performance. Improved operational efficiencies, reduced costs, and enhanced company reputation are the factors behind the positive relationship between sustainability practices and financial performance (Alshehhi et al., 2018). These factors also arouse interest in investors who are increasingly interested in ESG (environmental, social, and governance) criteria when making investment decisions.

Companies who invest in sustainability attract and retain talented employees more effectively than companies who do not invest in sustainability. Today, employees are seeking employers whose values align with their own values. According to a study conducted by Deloitte (2024), 44 % of generation Z (born 1997-2012) “have turned down an employer based on their personal ethics or beliefs”. Similar percentage for millennials (born 1981-1996) is 40 %. It can be concluded that companies who invest in sustainability are seen as more attractive workplaces. According to Morales-Sánchez and Martínez-Cañas (2021), investing in sustainability can also lead to increased employee satisfaction and happiness.

In the long term, a sustainable supply chain will have a positive effect on a company's performance (Chardine-Baumann & Botta-Genoulaz, 2014; Hossan & Quaddus, 2021). A sustainable supply chain increases a company’s competitive advantage in today's business environment (Chardine-Baumann & Botta-Genoulaz, 2014; Pullman & Sauter, 2012). According to Pullman and Sauter (2012), sustainable supply chain can provide competitive advantage by reducing costs, improving brand image, managing risk, promoting innovation, and fostering collaboration. Soni and Kodali (2019) confirm that sustainability initiatives can drive innovation and open new market opportunities in the manufacturing sector.

Wittstruck and Teuteberg (2012, p. 152), researched success factors of SSCM in electrics and electronics industry and found that there are four categories of benefits: resource (energy and material) efficiency, customer loyalty and corporate image, transparency

and performance of processes, and mutual learning. Table 1 presents Wittstruck and Teuteberg's findings in more detail including the categories and benefits per category. It can be noticed that the benefits are environmental, social, and economic.

Table 1. Benefits of SSCM (Wittstruck & Teuteberg, 2012, p. 152).

Category of benefits	**Type of benefits**
Resource (energy and material) efficiency	Reduction of energy consumption Reduction of material consumption Reduction of packaging waste Reduction of production waste Reduction of paper consumption Emission reduction
Customer loyalty and corporate image	Improved customer retention Increase in staff satisfaction Differentiation in competition Improvement of the corporate image
Transparency and performance of processes	More transparent flow of goods Shorter production times Product innovations Minimization of transport times
Mutual learning	Increased knowledge about occupational health and safety rules Increased knowledge about legal compliance Knowledge multiplication

In conclusion, sustainability investments are becoming more necessary for all companies. Nonetheless the high costs of sustainability investments, companies can derive multiple positive benefits from them in many areas. Improved sustainability performance improves competitiveness, financial performance, builds moral capital, helps mitigating business risks, and employee engagement and satisfaction. Sustainability practices also drive innovation and open new market opportunities, particularly in manufacturing. Compliance with sustainability regulations helps companies avoid sanctions and fines.

Investing in sustainability and improving sustainability performance is a strategic choice that enables benefits across environmental, social, and economic dimensions.

2.4 Sustainability frameworks, standards, and assessments

This chapter presents the sustainability frameworks, standards, and assessments that are strongly related to this study. United Nations 2030 Agenda and sustainable development goals (SDGs), Science-Based Targets Initiative (SBTi) and Science-Based Targets (SBTs), and EcoVadis are presented in following subchapters.

2.4.1 The 2030 Agenda and SDGs

United Nations "The 2030 Agenda for Sustainable Development" is "a plan of action for people, planet and prosperity" (United Nations, n.d. -b). The 2030 Agenda was adopted by all United Nations member states in 2015 (United Nations, n.d. -a). Sustainable development goals (SDGs) are at the core of the 2030 Agenda. The 17 SDGs and their 167 subgoals were created to enable a sustainable and balanced future environmentally, socially, and economically wise, covering topics such as improving health and education, ending poverty, reducing inequality, mitigating climate change, and advancing economic growth. The 17 SDGs are presented in figure 3.

Figure 3. UN SDGs (United Nations, n.d. -a).

Sustainable supply chain management is strongly related to the SDGs. According to Grainger-Brown and Malekpour (2019) SDGs create a great base for enabling balanced future. Zimon et al. (2020) state that SDGs can be utilized to create a framework for SSCM practices. Each SDG has a connection to sustainability dimensions; environmental, social, or economical (governance). Table 2 presents how Zimon et al. (2020) divide SDGs into the sustainability dimensions.

Table 2. SDGs divided into sustainability dimensions (Zimon et al., 2020).

Environmental	Social	Economical (governance)
6 Clean water and sanitation	1 No poverty	7 Affordable and clean energy
13 Climate action	2 Zero hunger	8 Decent work and economic growth
14 Life below water	3 Good health and well-being	9 Industry, innovation, and infrastructure
15 Life on land	4 Quality education	11 Sustainable cities and communities
	5 Gender equality	12 Responsible consumption and production
	10 Reduced inequality	
	16 Peace and justice strong institutions	
	17 Partnerships to achieve the goals	

Based on SDGs, the SSCM practices are sustainable supplier management, sustainable operations and risk management, and pressure and incentive management (Zimon et al., 2020). Sustainable supplier management includes for example green purchasing and green transportation. Sustainable operations and risk management covers for example green product design and energy consumption and emission reduction. Pressure and incentive management refer for example to reverse logistics and product recycling. Overall, SDGs create a solid base for SSCM. By incorporating suitable SDGs into business operations, a company can ensure comprehensive sustainability approach.

2.4.2 Science-Based Targets Initiative and Science-Based Targets

Science-based targets initiative (SBTi) is a corporate climate action organization, which is a charity, but its subsidiary is in charge of the target validation services (SBTi, n.d. -a). SBTi offers and develops standards, tools, and guidance to help companies achieve the net-zero by 2050. The organization collaborates closely with CDP, the United Nations Global Compact, the We Mean Business Coalition, the World Resources Institute (WRI), and the World Wide Fund for Nature (WWF).

Science-based targets (SBTs) are greenhouse gas emission reduction targets that companies can set. SBTs are helping to prevent the most harmful effects of climate change and limiting global warming to 1,5°C above pre-industrial levels, aligned with the Paris Agreement (SBTi, n.d. -b). By setting science-based targets companies help to prevent climate change and ensure growth that is safe for the future. Any company can set science-based targets as the targets are adapted based on the company and its industry's details. Setting a science-based target includes five phases: submitting a letter regarding the willingness about setting a target, developing an emission reduction target that is aligned with Science-based targets initiative (SBTi) requirements, presenting the target to the SBTi for validation, informing the target for stakeholders, and reporting emissions and tracking the target progress annually (SBTi, n.d. -b).

As the scope 3 usually causes most of an organization's emissions, reduction in scope 3 can affect largely to overall reductions (SBTi, n.d. -c). Scope 3 carbon footprint can be challenging to cope with and achieving reductions is complex, but SBTi can facilitate that. Most effective way to achieve scope 3 reductions is supplier engagement. Science-based targets can be set to support the supplier engagement.

SBTi's net-zero standard offers guidance and tools for organizations in order to set science-based net-zero targets (SBTi, n.d. -d). Net-zero refers to the aim to cut all GHG emissions to zero or close to it in scopes 1, 2, and 3. The standard provides a blueprint how an organization can align their net-zero plan with science.

In conclusion, the adoption of science-based targets represents an important step forward when mitigating climate change. By committing to GHG emission reduction targets companies demonstrate their dedication to a sustainable future. A key focus of SBTi implementation is in the supply chain because scope 3 emissions often cause the majority of a company's carbon footprint. Despite the challenges associated with scope 3 emission reductions, SBTi provides a framework for effective engagement with suppliers. SBTi's net-zero standard provides organizations guidance about setting targets to eliminate or reduce GHG emissions. Overall, SBTi enables companies proceed towards a sustainable future by utilizing science-based targets.

2.4.3 EcoVadis

EcoVadis is a sustainability assessment platform (EcoVadis, n.d.). It provides business sustainability ratings for companies. EcoVadis was founded in 2007 and has grown into the most widely used and trusted sustainability assessment platform in the world. The purpose of EcoVadis is to "guide all companies towards a sustainable world". Especially regarding global business, EcoVadis aims to enable the possibility for companies to be more sustainable, ethical, and responsible.

The methodology of EcoVadis is based on the international sustainability standards, such as the UN Global Compact and the Global Reporting Initiative. The quality of an organization's sustainability management is measured through three management pillars: policies, actions, and results (EcoVadis, 2023). The three pillars are divided into seven management indicators: policies, endorsements, measures, certifications, coverage – deployment of actions, reporting, and 360 watch findings. EcoVadis scorecard includes sustainability performance in four categories: environment, labor & human rights, ethics, and sustainable procurement (EcoVadis, n.d.). These four categories include 21 indicators which are presented in below list.

Environmental indicators:

- Energy consumption and greenhouse gases
- Water
- Biodiversity
- Air pollution
- Materials, chemicals, and waste
- Product use
- Product end-of-life
- Customer health and safety
- Environmental services and advocacy

Labor & human rights indicators:

- Employee health and safety
- Working conditions
- Social dialogue
- Career management and training
- Child labor, forced labor, and human trafficking
- Diversity, equity, inclusion
- External stakeholder human rights

Ethics indicators:

- Corruption
- Anticompetitive practices
- Responsible information management

Sustainable procurement indicators:

- Supplier environmental practices
- Supplier social practices

Based on the presented measures and criteria, EcoVadis provides a sustainability score for an organization (EcoVadis, 2023). The score varies between 0 and 100, 0 being the lowest and 100 the highest. The sustainability score describes an organization's sustainable management systems, allowing organizations to compare their score to other organizations in different industries, that are different size, or located other countries. EcoVadis also provides strengths and improvement areas for each of the four categories. Strengths demonstrate organization's commendable sustainability practices, while improvement areas signify aspects that require corrective action. Each improvement area is accompanied by a recommended priority level (low, medium, or high) for implementing a corrective action plan.

In conclusion, EcoVadis is useful tool for organizations with global supply chains to track and improve their sustainability. As EcoVadis assesses sustainability across four critical categories, it provides organizations a comprehensive view of their sustainability performance. Besides providing a sustainability score, EcoVadis also provides improvement areas which helps organizations to understand their sustainability performance more deeply and prioritize actions to improve weaknesses. Benchmarking and comparison capability of EcoVadis enables organizations to understand where they stand in terms of sustainability. Alignment of EcoVadis assessment with international sustainability standards ensures that organizations are measured against widely accepted criteria for sus-

tainability. For organizations with global supply chains, EcoVadis' assessment of sustainable procurement practices is particularly valuable. It helps companies evaluate the sustainability performance of their suppliers, promoting responsible sourcing and ethical practices throughout the supply chain.

3 Method

This thesis is conducted as an assignment for Smart Power division of ABB. ABB and its divisions have a comprehensive sustainability strategy, and they recognize the role of suppliers in overall sustainability. The role of this thesis is to provide insights how suppliers can improve their sustainability and how can ABB support its suppliers to improve their sustainability. Research problem and objectives were considered and decided together with Smart Power. The objectives of this thesis are to identify the key success factors of suppliers' sustainability and the benefits that suppliers' have derived from investing in sustainability, and to provide recommendations for Smart Power how to support its suppliers' sustainability path. Main aims of this research are to provide guidance how suppliers can improve their sustainability performance and motivate suppliers to invest in sustainability.

This chapter presents the methodology that will be utilized for the empirical part of this thesis. Research design, data collection, and data analysis will be presented in the following sub chapters.

3.1 Research design

This research was conducted as an exploratory multi-case study by using inductive mixed method approach. Exploratory study can be conducted by interviewing experts about the matter (Saunders et al., 2007, p. 133-134) which was the approach in this research. An exploratory approach was chosen for this study as it is a flexible method and compliant for changes along the process if new information occurs.

Case study utilizes multiple sources of data and therefore it is useful when a holistic or in-depth knowledge is required to understand the research problem (Eriksson & Kovalainen, 2015, p. 131). The intention of the multi-case study approach in this study was to gain understanding of how the top 10 rated suppliers in EcoVadis have approached

today's sustainability challenges in global supply chains. By interviewing and analyzing the chosen 10 suppliers, the most common sustainability success factors and improvement areas of the collaboration in global supply chains could be defined and therefore utilized in the future by Smart Power and its suppliers.

An inductive approach was suitable for this research due to its reasoning. Inductive approach to research begins from a specific perspective and data collection (DeCarlo, 2018). Then patterns or similarities within the data are explored and the perspective moves into a more general level instead of a specific perspective. Theory is then formed based on the general level perspective when the similarities are recognized and analyzed.

As mixed method study utilizes both qualitative and quantitative research methods, it was a convenient approach for this research. In this study quantitative research created the foundation for qualitative research. Quantitative research was based on secondary data from suppliers' EcoVadis scorecards. By having conducted quantitative research first, qualitative research was based on its findings.

3.2 Data collection

The sampling technique for this study was non-probability sampling as the decision to choose the case companies (suppliers) for this study was based on high EcoVadis ratings. Non-probability sampling was suitable for this study as one of the research objectives is to identify the sustainability success factors of suppliers. Therefore, it was convenient to analyze the most high-performance suppliers and their sustainability success factors.

Smart Power has 5833 suppliers in total of which 338 belong to class A. The suppliers of this study belong to class A. The sample size in this research was 10 as there are 10 case companies. However, there were 13 interviewees in total as three suppliers A, F, and H had two interviewees, and rest of the suppliers had one interviewee. The interviewees

are people who have knowledge about their organization's sustainability. Table 3 presents interviewees anonymously. Supplier H provided additional information by e-mail after the interview.

Table 3. Information about the interviewees.

Supplier	Number of interviewees	Title of the interviewee(s)
A	1	Purchase, Owner
B	1	Quality System Responsible / Customer Quality
C	2	Head of ESG & Sustainability Specialist ESG & Sustainability
D	2	Sustainability Specialist Quality Manager
E	1	Quality Manager
F	2	Director Sales Industry & Residential Environmental manager
G	1	Operation Manager
H		Customer Support & Logistics Manager Lead Auditor
I	1	Human Resources and Foreign Relations Manager
J	1	Executive Manager

Data collection of the thesis utilized quantitative secondary data and qualitative primary data. Quantitative secondary data was EcoVadis scorecards of the top 10 rated suppliers. Qualitative primary data was collected through semi-structured interviews with the 10 suppliers. Interview data is verbal data as verbal data means data that is collected from interviewee's speech (Saunders et al. 2023, p. 652). EcoVadis scorecard data includes numerical and text data as the scorecards include comments based on the scorecard ratings which are numerical. Secondary quantitative data was collected from the EcoVadis scorecards of each of the 10 suppliers. The data was exported from EcoVadis to Excel

file where the data was categorized into environment, labor & human rights, ethics, and sustainable procurement categories.

According to Saunders et al. (2023, p. 833) semi-structured interviews include pre-set themes and questions which guide the interview. In exploratory study, semi-structured interviews can help in identification of causal relationships and reasons for decision-making (Saunders et al. 2023, p. 450). The semi-structured interviews included five themes, leaving the possibility for the discussion to flow but ensuring to have answers for required questions. Themes of the questions were the history of sustainable development in the company, impacts of investing in sustainability, sustainability requirements from the customers, role of the customer, and future. There were 5 predetermined questions which are listed below.

1. What strategies and actions have made your organization more sustainable over the years?
2. How has the implementation of sustainable practices impacted your organization? Can you describe the benefits or challenges?
3. Are there any sustainability requirements from the main customers? Have these requirements affected your sustainability strategy?
4. What role do you expect customers to play in supporting and advancing your organization's sustainability agenda?
5. What are the key sustainability goals or areas of focus for your organization in the near and distant future? And what role do you foresee customers playing in achieving these goals?

Interviews were held remotely via Microsoft Teams and in English. They were scheduled to take 30 minutes, but the actual time of the interviews varied between 15:24 and 38:02. The interviews were recorded and transcribed by using Microsoft Teams' own transcribing tool.

3.3 Data analysis

After determining the research design, sampling, and data collection, the data analysis was conducted by using different methods. To answer RQ1, both quantitative and qualitative data were utilized. To answer RQ2 and RQ3, only qualitative data was utilized. The analysis of both data sets was conducted concurrently, but the quantitative data was needed to form the outline of the most highly rated suppliers in EcoVadis. It was a crucial step to begin with as the intention was to focus on the most successful suppliers' sustainability wise.

As stated in previous chapter, the quantitative data was exported from the suppliers' EcoVadis scorecards into an Excel file where the data was categorized based on EcoVadis categories: environment, labor & human rights, ethics, and sustainable procurement. Only data related to EcoVadis "Strengths" was considered as "Improvement areas" are not related to research questions. Frequency analysis was utilized for EcoVadis data. EcoVadis "Strengths" were listed in descending order within each category based on their frequency within the 10 suppliers. Thus, the strengths that were most common between the suppliers were identified. Strengths with frequency of 7 or higher were considered in this research.

For the qualitative data collected through semi-structured interviews, an inductive approach was utilized. A thematic approach was chosen for the coding of the interview data. The first step of the thematic approach was to familiarize with the collected data. After familiarization, coding of the interview transcripts was conducted. Similar codes were merged under one code. The codes were collected into an Excel file based on the research questions in order to recognize recurring themes. The first sheet of the Excel file was based on RQ1, and it included codes regarding sustainability success factors. The second sheet was based on RQ2, and it included codes related to benefits derived from sustainability. The third sheet was related to RQ3 and included codes regarding support and cooperation within global supply chains. The fourth and last sheet was used for codes that were not clearly related to any research question. Frequency of each code

was also listed in the Excel file. For RQ1, codes that had frequency of 4 higher were taken into account. For RQ2 and RQ3, only codes with frequency of 2 or higher were considered in this study.

Lastly, EcoVadis and interview data were combined in one Excel divided based on the research questions to achieve a clear understanding of the findings but also of similarities and differences between data sources.

3.4 Case companies and their EcoVadis assessments

This study was conducted by analyzing and interviewing EcoVadis' top 10 ranked suppliers of Smart Power. This chapter will introduce the 10 suppliers and their EcoVadis scores. As the supplier are anonymous, each supplier has a code letter between A to J. Supplier A is the highest ranked and supplier J is the 10^{th} highest ranked supplier of Smart Power based on EcoVadis assessments. All data about suppliers presented is based on EcoVadis data.

The size of supplier companies in this study varied from XS (26-99 employees) to L (1000+ employees). S size suppliers have 26-99 employees, M size suppliers 100-999 employees, and L size over 1000 employees). All 10 suppliers are located in Europe and in EU countries.

On general level, all 10 suppliers are in manufacturing industry. However, there are 8 different industries between the 10 suppliers. Industries are Treatment and coating of metals; machining, Manufacture of other fabricated metal products n.e.c., Manufacture of electronic components and boards, Manufacture of electric motors, generators, transformers and electricity distribution and control ap, Manufacture of basic precious and other non-ferrous metals, Forging, pressing, stamping and roll-forming of metal; powder

metallurgy, Manufacture of plastics products, and Manufacture of other electrical equipment. Table 4 presents suppliers' code letters, company size, and specific industry based on EcoVadis data.

Table 4. Information about the 10 suppliers of ABB Smart Power.

Supplier	Company size	Industry
A	XS	Treatment and coating of metals; machining
B	S	Manufacture of other fabricated metal products n.e.c.
C	L	Manufacture of electronic components and boards
D	S	Treatment and coating of metals; machining
E	S	Manufacture of electric motors, generators, transformers and electricity distribution and control ap
F	M	Manufacture of basic precious and other non-ferrous metals
G	M	Forging, pressing, stamping and roll-forming of metal; powder metallurgy
H	M	Manufacture of electric motors, generators, transformers and electricity distribution and control ap
I	S	Manufacture of plastics products
J	S	Manufacture of other electrical equipment

EcoVadis ratings of the top 10 suppliers varied from 79/100 to 60/100. Ratings of the suppliers are higher than or equal to the score of 78 percent of the companies rated by EcoVadis. Therefore, the suppliers are in the top 22 percent of the companies rated by EcoVadis. The percentile rank is formed at the time of score publication. Table 5 presents the overall EcoVadis scores of each supplier. The overall score is based on four categories: environment, labor and human rights, ethics, and sustainable procurement.

Table 5. EcoVadis score of each supplier.

Supplier	Overall score
A	79

Supplier	Overall score
B	72
C	71
D	69
E	64
F	62
G	62
H	62
I	61
J	60

Table 6 presents the EcoVadis scores in more detail, including the score of environment, labor and human rights, ethics, and sustainable procurement categories. within the four categories. EcoVadis does not require or inform sustainable procurement information from XS size companies. Therefore, supplier A does not have a score for sustainable procurement.

Table 6. Detailed EcoVadis score of each supplier.

Supplier	Environment	Labor & human rights	Ethics	Sustainable procurement
A	80	80	70	N/A
B	70	80	70	50
C	90	70	60	50
D	70	70	70	60
E	70	60	60	70
F	70	60	40	60
G	70	60	50	60
H	60	70	60	40
I	60	70	40	50

Supplier	Environment	Labor & human rights	Ethics	Sustainable procurement
J	60	60	60	60

4 Results

This chapter presents the results concluded by utilizing previously presented research methods. Results are divided into sub-chapters based on research questions. Therefore, chapter 4.1 answers what suppliers' sustainability success factors are. Chapter 4.2 presents the benefits suppliers have derived from investing in sustainability. Lastly, chapter 4.3 answers how Smart Power can support its suppliers to improve their sustainability.

4.1 Suppliers' sustainability success factors

This chapter presents the findings related to the sustainability success factors of Smart Power's suppliers, addressing research question 1. The findings are derived from EcoVadis assessments and semi-structured interviews conducted with suppliers. By identifying the success factors, the study aims to provide a comprehensive understanding of what drives sustainability among suppliers. Firstly, the findings are presented based on their data source (EcoVadis or interview data) and then integrated together to create coherent understanding.

4.1.1 Overview of EcoVadis data

The EcoVadis assessments provided a comprehensive evaluation of suppliers' sustainability performance and practices. Twelve success factors were identified from EcoVadis data. The following figure 4 presents the factors that were identified as success factors from EcoVadis data, along with their frequency of occurrence among the ten suppliers surveyed.

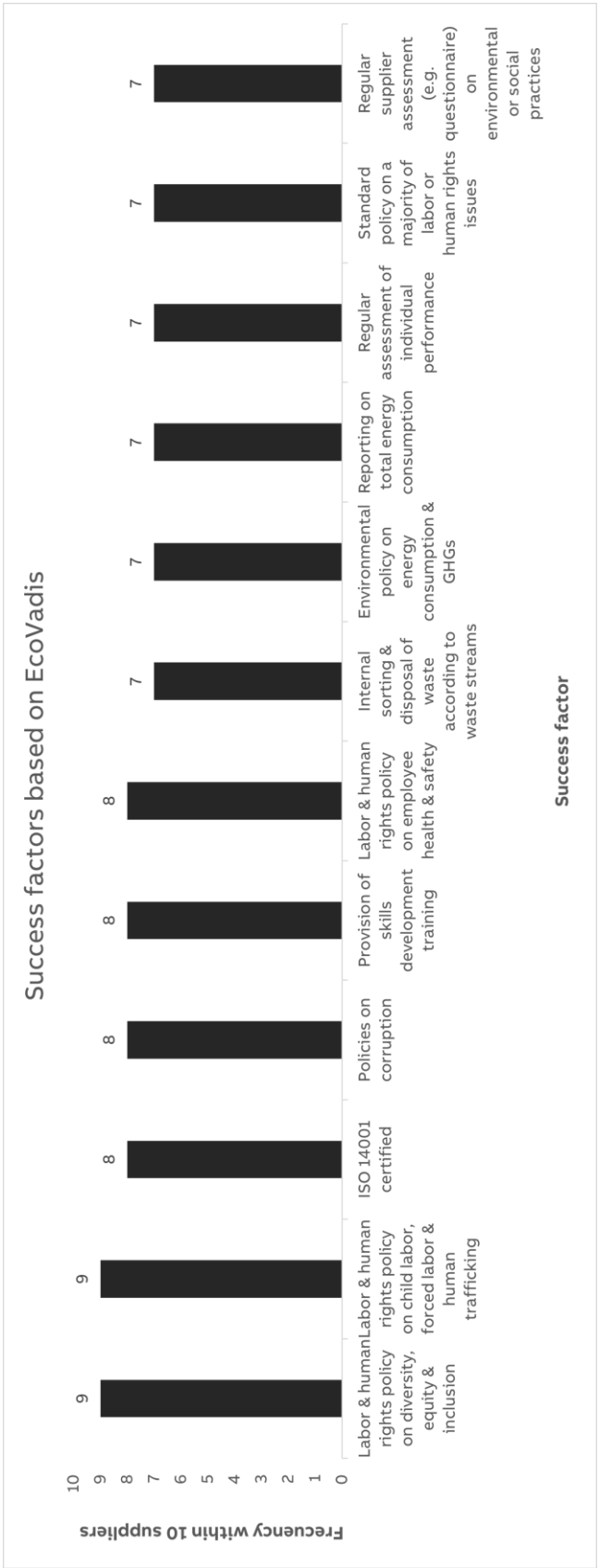

Figure 4. Success factors based on EcoVadis assessments.

The identified success factors based on EcoVadis assessments indicate that ethical labor practices, environmental management, and ethical business practices were highly prioritized by the suppliers. Policies on diversity, child labor, forced labor, and health and safety had the highest frequency, reflecting their critical role in sustainability performance.

The success factors can be divided into categories based on EcoVadis' category split. EcoVadis' categories are labor & human rights, environment, ethics, and sustainable procurement. Six out of twelve identified success factors belong under labor and human rights category. These success factors are labor & human rights policy on diversity, equity & inclusion, labor & human rights policy on child labor, forced labor & human trafficking, labor & human rights policy on employee health & safety, provision of skills development training, standard policy on a majority of labor or human rights issues, and regular assessment of individual performance. Four success factors belong to environment category: ISO 14001 certified, environmental policy on energy consumption & GHGs, internal sorting & disposal of waste according to waste streams, and reporting on total energy consumption. Policies on corruptions -factor belongs to ethics category. Sustainable procurement category includes the factor about regular supplier assessment (e.g. questionnaire) on environmental or social practices. Categories of EcoVadis and the frequency of the factors in each category are presented in figure 5.

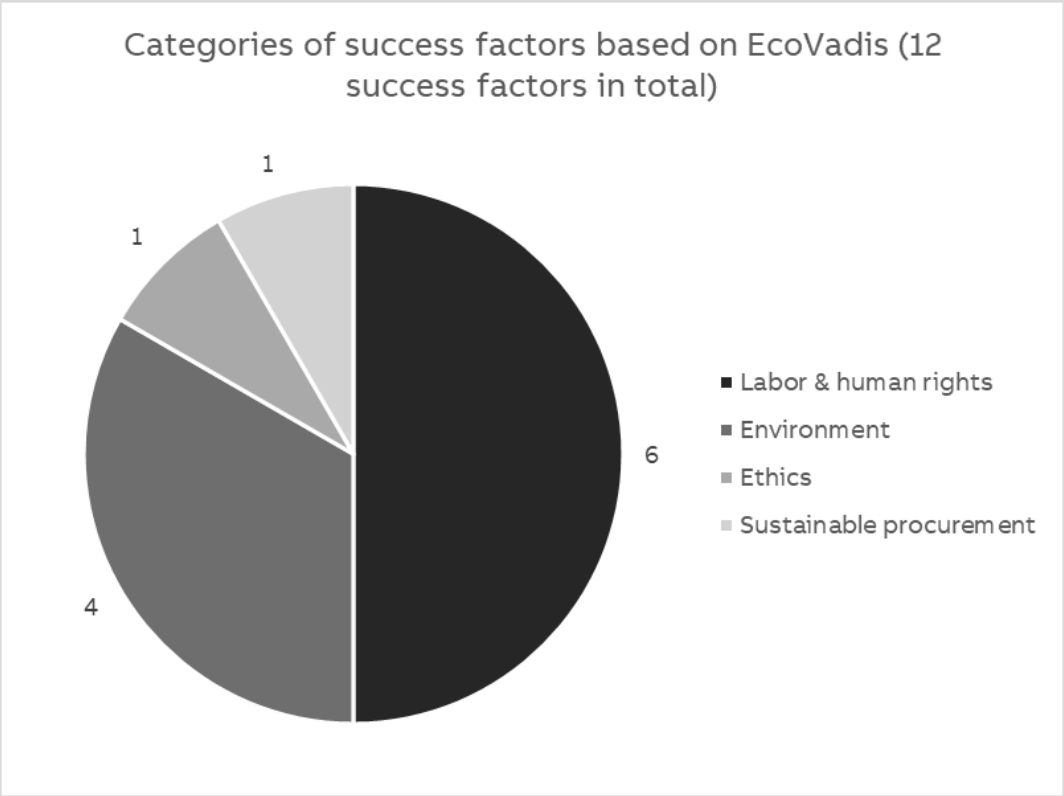

Figure 5. Categories of success factors based on EcoVadis assessments.

The categories can be divided into more detailed subcategories to create a more comprehensive understanding about the success factors of suppliers' sustainability. Subcategories are based on EcoVadis' category split. The subcategories are policies about labor and human rights, actions for environment, actions for labor and human rights, policies about environment, results about environment, policies about ethics, and actions for sustainable procurement. Subcategories and frequency of factors in subcategories are presented in figure 6.

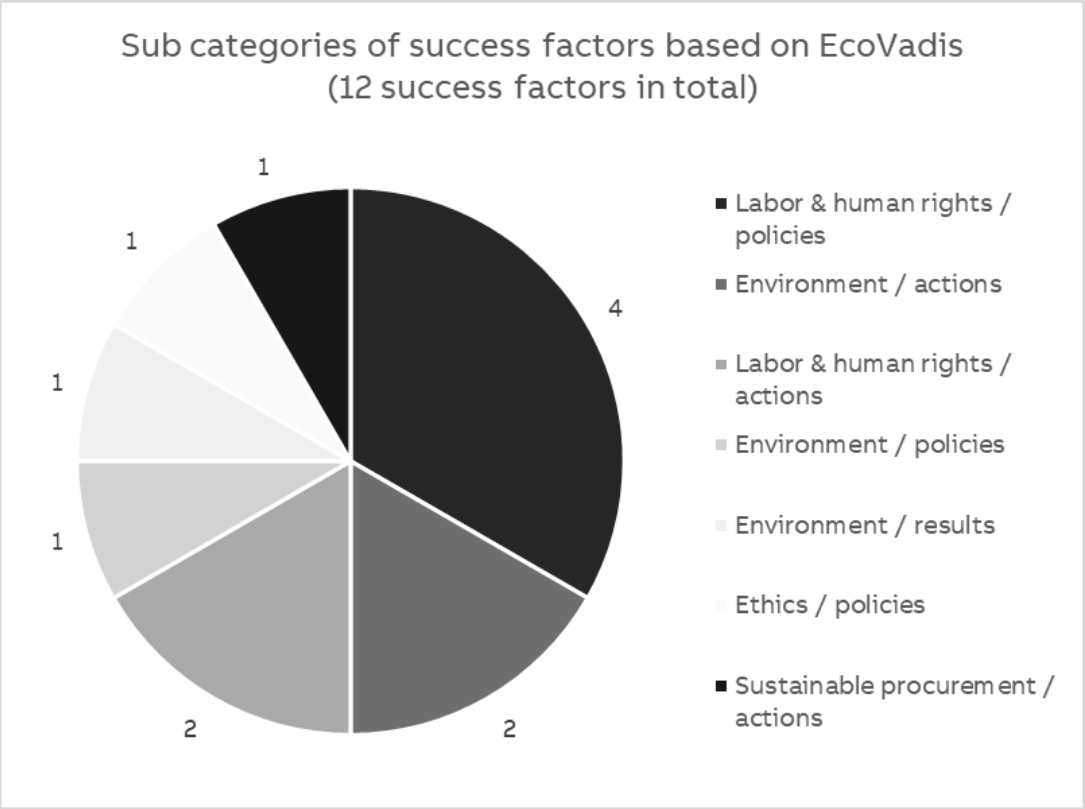

Figure 6. Subcategories of success factors based on EcoVadis assessments.

4.1.2 Overview of interview data

The semi-structured interviews with ABB's suppliers provided insights about the success factors driving suppliers' sustainability. Figure 7 presents the factors that were the most frequently mentioned in interviews. Overall, the interview data highlighted the practical aspects of sustainability such as the use of green energy, stakeholder collaboration, environmentally friendly transportation methods, waste management, and sustainability strategy.

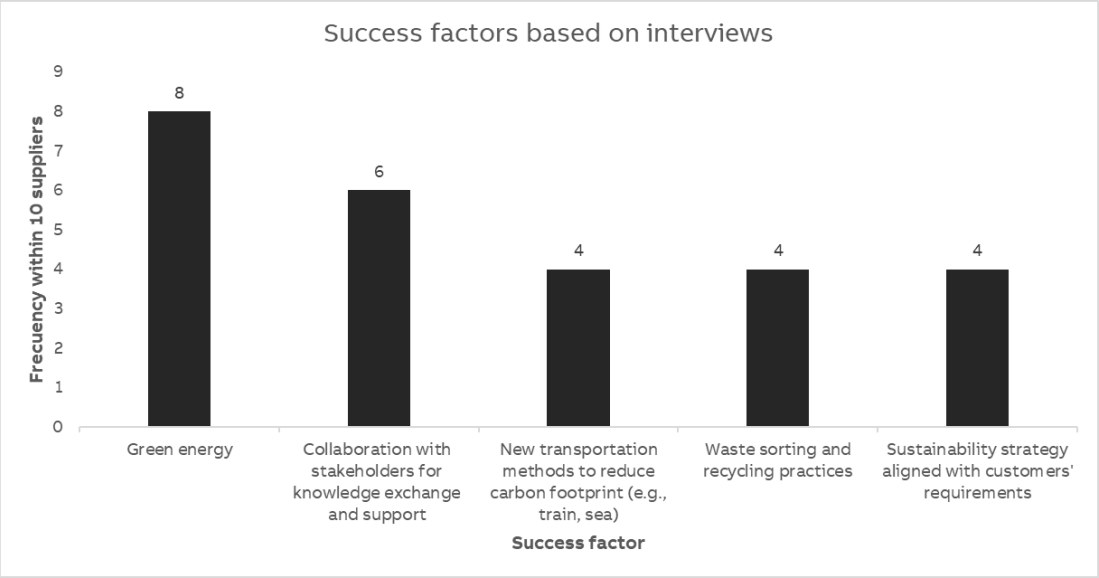

Figure 7. Success factors based on interviews.

Based on interviews, there were five success factors in total: use of green energy, collaboration with stakeholders, new environmentally friendly transportation methods, waste sorting and recycling practices, and sustainability strategy aligned with customers' requirements.

These success factors can be divided in broader categories based on their environmental, social, and governance effects. Use of green energy, new transportation methods, waste sorting and recycling belong to environmental category. Collaboration with stakeholders for knowledge exchange and support belong to social category. To governance category belongs the factor about aligning sustainability strategy with customers' requirements. Figure 8 presents the success factors divided into environmental, social, and governance categories.

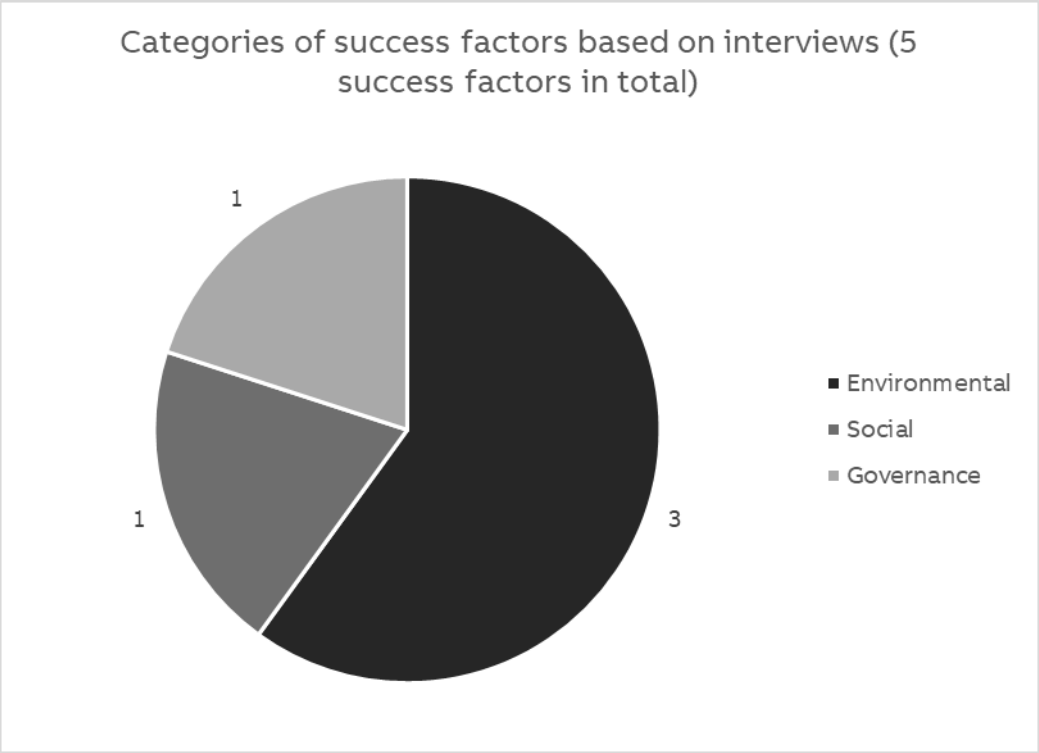

Figure 8. Categories of success factors based on interviews.

It can be noticed that based on interviews, environmental success factors are the most important factors advancing suppliers' sustainability performance as three factors belong to environmental category. Factors in social and governance categories are equally important as both categories include one factor.

The factors under each category can be categorized into more detailed subcategories. Energy, transportation and logistics, and waste management subcategories belong to environmental category. Stakeholder engagement and collaboration is the factor in social category. Strategic integration and alignment are the subcategory of governance category. Dividing the success factors into subcategories provides more comprehensive understanding that which sustainability initiatives are important for successful sustainability performance. The subcategories and their frequency are presented in figure 9.

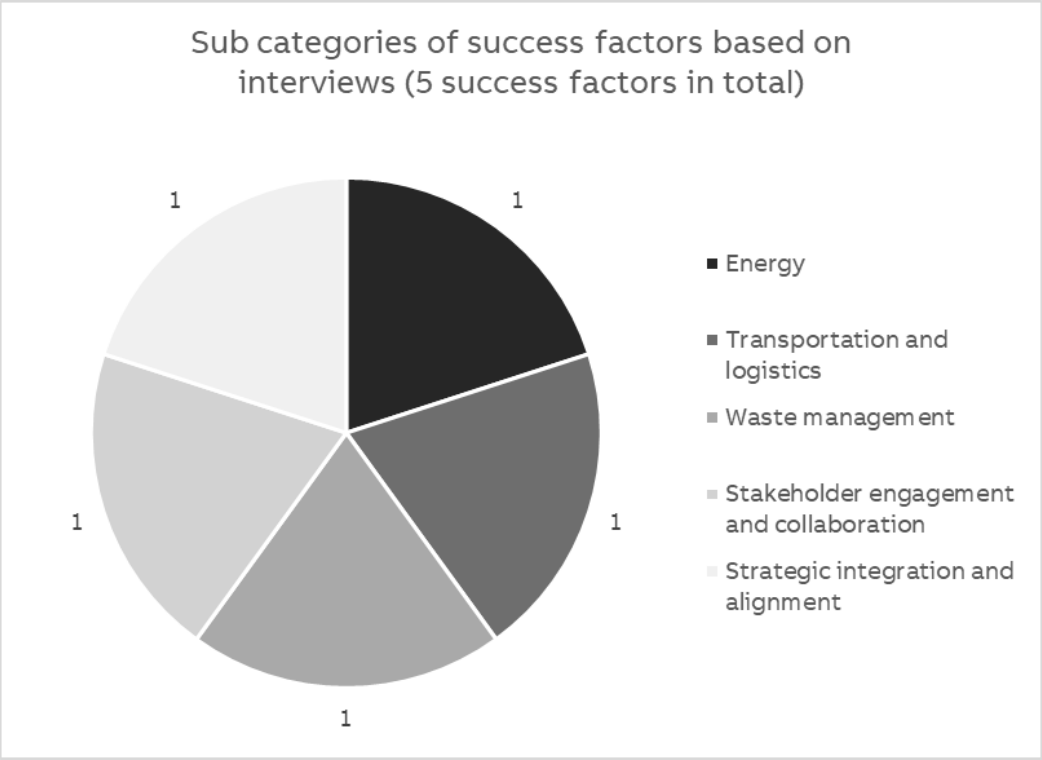

Figure 9. Subcategories of success factors based on interviews.

4.1.3 Integrated success factors

Integrating the findings from both EcoVadis data and interview data, several key success factors for suppliers' sustainability were identified. Tables 7, 8, and 9 present the success factors divided into environmental, social, and governance categories and the sources of the factors, listed in descending order based on their frequency. The factors were categorized based on their primary focus, whether the factor aims to improve social aspects, environmental practices, or governance and compliance. Table 7 includes factors that belong to the environmental category. Table 8 presents the factors of social category. Table 9 includes the governance factors.

Table 7. Environmental success factors.

Environmental	Frequency	Source
ISO 14001 certification	8	EcoVadis
Use of green energy	8	Interview
Environmental policy on energy consumption & GHGs	7	EcoVadis

Environmental	Frequency	Source
Reporting on total energy consumption	7	EcoVadis
Internal sorting & disposal of waste according to waste streams	7	EcoVadis
Waste sorting and recycling practices	4	Interview
Adoption of new transportation methods to reduce carbon footprint	4	Interview
Total of 7 success factors		

Table 8. Social success factors.

Social	Frequency	Source
Labor & human rights policy on diversity, equity & inclusion	9	EcoVadis
Labor & human rights policy on child labor, forced labor & human trafficking	9	EcoVadis
Labor & human rights policy on employee health & safety	8	EcoVadis
Provision of skills development training	8	EcoVadis
Standard policy on a majority of labor or human rights issues	7	EcoVadis
Regular assessment of individual performance	7	EcoVadis
Collaboration with stakeholders for knowledge exchange and support	6	Interview
Total of 7 success factors		

Table 9. Governance success factors.

Governance	Frequency	Source
Policies on corruption	8	EcoVadis
Regular supplier assessment (e.g. questionnaire) on environmental or social practices	7	EcoVadis
Sustainability strategy aligned with customer requirements	4	Interview
Total of 3 success factors		

In total, 17 success factors were identified. Both environmental and social categories included 7 factors. Governance category included 3 factors. EcoVadis data revealed 12 success factors of which 4 belong to environmental category, 6 to social category, and 2 to

governance category. Five success factors were identified from interview data. Three of those factors belong to environmental category, 1 to social category, and 1 to governance category.

4.2 Benefits derived from investing in sustainability

This chapter presents the benefits that suppliers have gained from their sustainability efforts, answering research question 2. The findings are based on interview data collected from Smart Power's suppliers. Four benefits were identified: reduction of GHG emissions, cost reductions, enhanced brand reputation, and improved efficiency. Figure 10 presents the benefits and frequency of each benefit within the 10 suppliers.

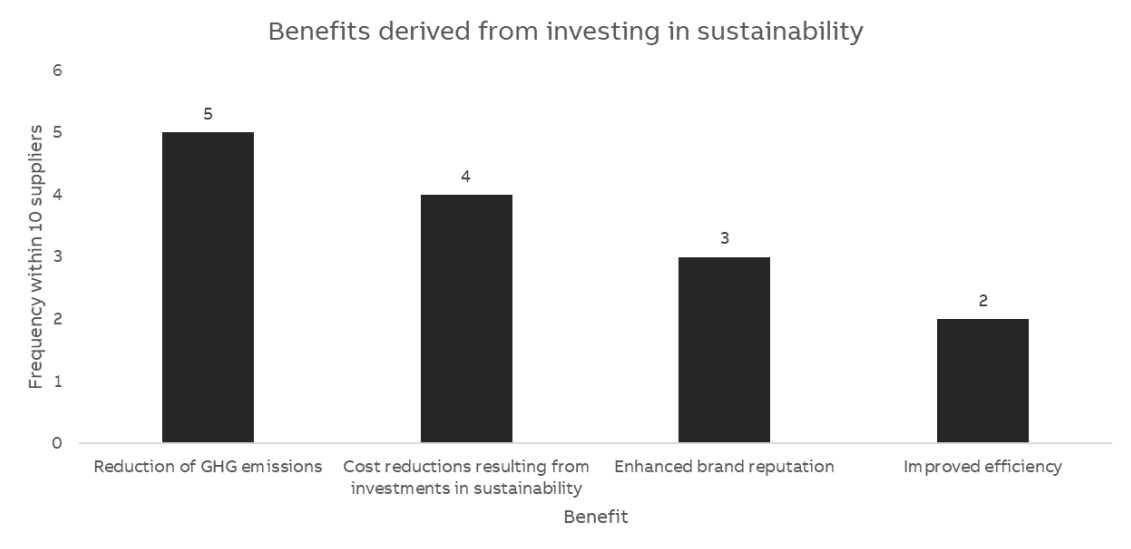

Figure 10. Benefits derived from investing in sustainability.

The most frequently mentioned benefit was the reduction of GHG emissions, mentioned by five of the suppliers. Suppliers reported implementing renewable energy sources, such as solar panels or replacing heating system from oil-based to ground-based, which reduced their GHG emissions. Two suppliers mentioned that emission reductions were achieved for example, through offering electrical bicycle leasing possibility or offering free charging stations for electrical vehicles by the office.

Four suppliers noted that sustainability investments led to cost savings. The installation of energy-efficient equipment and optimization of resources use resulted in lower utility bills and operational costs. One supplier mentioned that changing the heating system to more environmentally friendly system, was a costly investment but through the investment they have achieved cost efficiency due to the new system being more efficient and in addition, the air quality in the building is better. Another supplier stated that they have achieved cost reductions because they started to produce their own (green) energy and not supplying it from energy supplier. In addition, this has also led to reduced dependency from the energy supplier which creates financial stability.

Enhanced brand reputation was another benefit. Suppliers found that sustainability efforts improved their reputation among stakeholders which has led to stronger business relationships. When asked about the benefits derived from sustainability investments, one interviewee directly mentioned that sustainability has positively impacted to the reputation of their company. Interviewee continued stating that improved reputation has positively affected their sales, market position, and employee engagement and motivation. Other supplier mentioned that sustainability has increased their customer and supplier loyalty and attracted skilled personnel.

Improved efficiency was fourth benefit mentioned by suppliers. Improved processes, better waste management, and optimized resource utilization reduced environmental impact and increased productivity. One supplier mentioned that they have noticed employees work more efficiently and being more engaged because of cleaner production zone due to improved waste management practices. Other supplier connected enhanced brand reputation and improved efficiency together. The supplier stated that employees are highly motivated to work in that specific company due to the company's ambitious sustainability aims which improves performance of employees.

Overall, suppliers derived benefits from their sustainability efforts, including environmental, economic, reputational, and operational advantages. The reduction of GHG emissions, cost savings, enhanced brand reputation, and improved efficiency were highlighted as outcomes of sustainability investments.

4.3 Support in global supply chain

This chapter focuses answering research question 3: how focal companies can support suppliers within sustainability theme in global supply chains, especially how ABB can support its suppliers and therefore maximize mutual value. The findings are derived from interview data. All ten suppliers mentioned recognition of the need for collaboration and support in global supply chains. This was followed by the need for training and assistance, expectations for open-book partnerships, and collaboration on economic issues. Figure 11 presents the expectations suppliers mentioned in descending order.

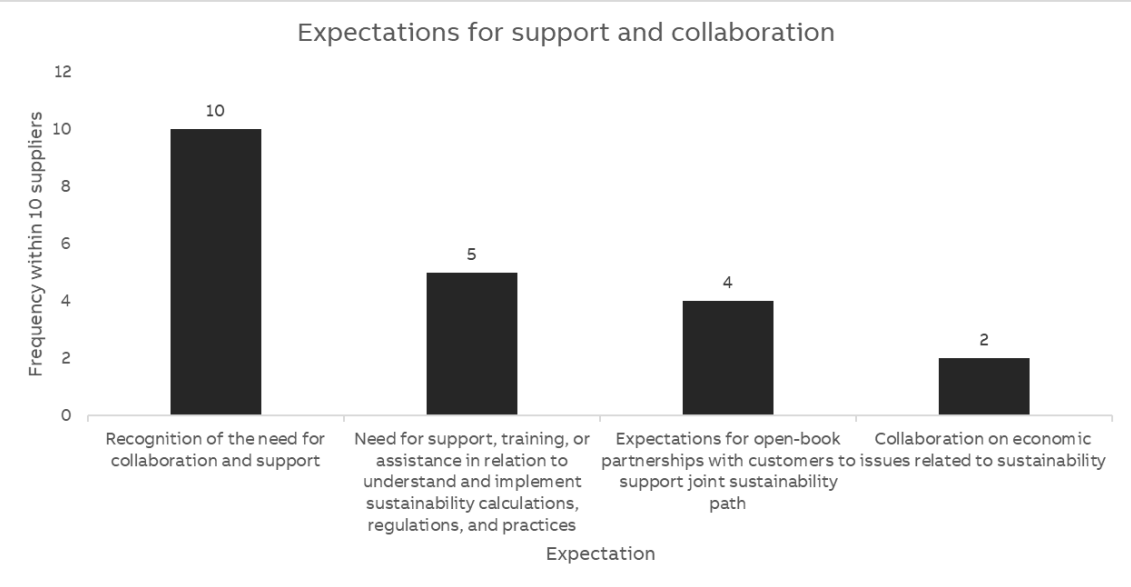

Figure 11. Expectations for support and/or collaboration.

All ten suppliers recognized the need for collaboration and support regarding sustainability in global supply chains. They stated that cooperative approach to sustainability is

crucial as all companies are currently facing similar sustainability regulations and challenges. One interviewee mentioned that companies should approach sustainability as joint journey. The interviewee continued: “On this sustainability path we will be together developing instead of learning from someone”.

Five of the suppliers mentioned the need for support, training, or assistance in understanding and implementing sustainability calculations, regulations, and practices. All these five suppliers were smaller than medium size companies, which indicates that small size companies do not have resources to meet the sustainability regulations or expectations without external help. One of the suppliers mentioned utilizing the knowledge of university students, for example, with CBAM calculations as students have up-to-date knowledge about sustainability. One interviewee suggested that ABB could start an education program for its tier 1 and 2 suppliers to tackle the challenge of lack of information of suppliers. The interviewee gave an example of once-a-month webinars, where relevant sustainability topics, such as GHG scopes and EcoVadis assessments, could be covered.

Four suppliers mentioned the expectation for open-book partnerships with customers to support a joint sustainability path. By open-book partnerships they referred to transparent sharing of information and costs, which would foster trust and collaborative problem-solving. One interviewee stated: “By improving together, our performance will improve. So, if we change our way to work, our customers will receive a better (sustainability) performance too”.

Two suppliers emphasized the need for collaboration on economic issues related to sustainability. They referred to the challenge of finding the economic balance between prices of the products and sustainability investments. One supplier commented: “I have to say that when we focus on sustainability, we are often facing discussion related to the prices of our pieces and the sustainability is only residual part of that discussion. That’s a pity from our point of view”. If suppliers invest in sustainability, it will increase their

prices which could lead to customer loss or at least to declining profit. By economic collaboration suppliers meant, for example, that ABB could agree supply from them with higher prices if they achieve and maintain certain sustainability level. Suppliers mentioned that economic collaboration could enable them to invest in sustainability without worrying about customer loss or declining profit.

The findings enhanced the expectations that suppliers have regarding the support they need from ABB to improve their sustainability efforts. Recognizing the need for collaboration, providing training and assistance, fostering open-book partnerships, and collaborating on economic issues were identified as important support mechanisms.

4.4 Discussion

This chapter discusses the results presented in previous chapter in more detail. Chapter 4.4.1 and its subchapters discuss the sustainability success factors of suppliers. Chapter 4.4.2 discusses the benefits suppliers have derived from investing in sustainability. Lasty, chapter 4.4.3 reflects to the findings related to suppliers' expectations for support in global supply chain.

4.4.1 Success factors

As suppliers have an important role in forming a focal company's sustainability performance, it was important to identify the success factors that promote suppliers' sustainability performance. As presented in chapter 4.1.3, 17 sustainability success factors of suppliers' sustainability performance were identified overall. These 17 success factors belong to environmental, social, and governance dimensions of sustainability which refers that suppliers need to focus on every category to improve their sustainability performance. However, if suppliers, especially small size suppliers, do not have resources to invest in every category, they should focus on environmental and social sustainability

initiatives as those categories were equally important for successful sustainability performance. More specifically, according to this study factors related to green energy, waste management, and stakeholder management are the most crucial factors as they were identified in EcoVadis data and interview data.

Findings between EcoVadis and interview data highlighted different categories and success factors as the most crucial for achieving successful sustainability performance. Based on EcoVadis data, social success factors, such as labor and human right policies, are the most important when aiming to form a strong sustainability status as six out of twelve success factors identified from EcoVadis data belong to social category. According to the interviews, the most important category is environmental category, including three out of five success factors identified from interview data. These differences between findings may indicate that interviewees highlighted concrete sustainability initiatives, such as waste management and environmentally friendly transportation methods, instead of focusing on sustainability as a holistic outcome of environmental, social, and governance efforts. Whereas EcoVadis assessments considered sustainability in more holistic picture, including all three dimensions of sustainability equally. The differences may also indicate that interviewees tend to view sustainability primarily through environmental measures and activities. Despite the differences, it can be stated that a comprehensive approach to sustainability including all three dimensions is crucial for achieving successful sustainability status and the benefits derived from sustainability achievements.

4.4.1.1 Environmental success factors

The identified environmental success factors were ISO 14001 certification, use of green energy, environmental policy on energy consumption & GHG, reporting on total energy consumption, internal sorting & disposal of waste according to waste streams, waste sorting and recycling practices, and adoption of new transportation methods to reduce carbon footprint.

Environmental management practices, especially ISO 14001 certification and use of green energy, were highly prioritized among suppliers. ISO 14001 is a standard for effective environmental management systems and provides a framework, helping companies develop their environmental performance (ISO, 2015). ISO 14001 enables companies to reduce their environmental impact, meet applicable legal obligations, and accomplish their environmental goals. Reporting on energy consumption and greenhouse gas (GHG) emissions represent transparency and accountability in environmental performance.

The success factors about green energy, integration of waste management practice, and environmentally friendly transportation methods reflect suppliers' commitment to reduce and minimize their environmental impact. These practices are important for mitigating climate change. Many suppliers mentioned that they have installed photovoltaic panels, or they have decided to purchase only green energy. One interviewee mentioned that their plants are CO2 neutral which is a result from purchasing green energy and creating closed loops to reuse heat. Other supplier started to require use of green energy from its suppliers as the supplier recognizes the importance of green energy in decreasing emissions. The same supplier continued stating that they constantly seek to find more environmentally friendly transportation methods. Interviewee mentioned that it is significantly easier than five years ago as the forwarders are more conscious about sustainability challenges.

4.4.1.2 Social success factors

Based on the findings, social success factors are labor & human rights policy on diversity, equity & inclusion, labor & human rights policy on child labor, forced labor & human trafficking, labor & human rights policy on employee health & safety, provision of skills development training, standard policy on a majority of labor or human rights issues, regular assessment of individual performance, and collaboration with stakeholders for knowledge exchange and support.

Social success factors largely focused on ethical labor practices and employee wellbeing. Policies on diversity, equity, and inclusion (DEI), and measures against child labor, forced labor, and human trafficking had the highest frequency within the social category. This refers to the suppliers' commitment to maintaining and improving human rights and ensuring fair treatment of all employees.

High frequency of health and safety policies indicate that suppliers recognize the connection between employee well-being and productivity. The provision of skills development training further supports this by improving employees' competencies and fostering a culture of continuous improvement.

Regular assessments of individual performance and having a standard policy on labor or human rights issues indicate that suppliers have a structured approach to monitoring and improving labor practices. Collaboration with stakeholders for knowledge exchange and support was also highlighted which reflects the importance of external partnerships in advancing social sustainability. One supplier mentioned the material challenges that the industry is facing as there are only very few environmentally friendly materials yet in the market. Therefore, the supplier highlighted the importance of collaboration with their own suppliers as they are important partners when finding and developing the right materials.

4.4.1.3 Governance success factors

Policies on corruption, regular supplier assessment on environmental or social practices, and sustainability strategy aligned with customer requirements were identified as the success factors of governance category.

These governance success factors are important for ensuring ethical business practices and compliance with legal and regulatory requirements. Policies on corruption and regular supplier assessments on environmental or social practices were identified as key success factors in governance category. These practices can help suppliers mitigating risks associated with unethical behavior and ensure that their suppliers maintain high standards of integrity.

Aligning sustainability strategy with customers' requirements is an important approach to the joint sustainability journey as all companies are facing similar sustainability challenges and regulations simultaneously. This alignment meets customer expectations and facilitates collaborative efforts to achieve shared sustainability goals and improving mutual value creation. In addition, by aligning the strategy with customer requirements suppliers can ensure higher customer satisfaction. One supplier stated that their customers' sustainability requirements directly effect on their sustainability strategy as customers are the reasons for their business. However, other supplier mentioned that the sustainability regulations are same for every company within the industry and therefore, customers' requirements do not affect their strategy as the supplier follows the regulations and enhances continuous improvement.

4.4.2 Benefits

In order to motivate suppliers to improve their sustainability performance and invest in sustainability, the benefits derived from suppliers' sustainability investments were identified. The findings indicated that suppliers have gained wide-ranging benefits from their sustainability investments. Overall, suppliers have achieved emission and cost reductions, and improved their brand image and operational efficiency. Sustainability investments can be expensive, but the benefits derived from them will most likely be more cost-effective in the long-term.

Emission reductions, cost reductions, enhanced brand reputation, and improved efficiency were the benefits suppliers identified as benefits resulting from investing in sustainability. Reflecting this study's identified benefits to the benefits of SSCM that Wittstruck and Teuteberg (2012, p. 152) found, similarities can be noticed. According to Wittstruck and Teuteberg, the categories of benefits of SSCM are resource (energy and material) efficiency, customer loyalty and corporate image, transparency and performance of processes, and mutual learning.

According to Wong et al. (2021), sharing environmental information with stakeholders, eases connecting environmental attempts within supply chains. Companies who voluntarily share environmental information with stakeholders are seen as more transparent. The identified benefit about enhanced brand reputation may result from sharing sustainability information with stakeholders and being transparent. One supplier mentioned that its reputation among customers has improved due to investing in sustainability which has resulted higher sales and even improved employee engagement and satisfaction.

According to Ali et al. (2019), environmental sustainability initiatives, such as waste and energy management, affect positively on a company's sustainability performance. Lu and Taylor (2016) found that a company's environmental sustainability affects positively to the relationship between company's sustainability performance and financial performance. Therefore, a company may achieve financial benefits from investing in environmental sustainability. According to Kumar et al. (2023), suppliers can improve their operational performance and competitiveness through sustainability efforts, achieving higher customer satisfaction and cost reductions. This study's findings correlate with previous research, as suppliers reported that they have achieved cost reductions and improved their brand reputation from investing in sustainability.

4.4.3 Support in global supply chain

Improving sustainability performance and complying with the sustainability regulations can be challenging. Therefore, suppliers' expectations for collaboration and support in global supply chain were identified. All suppliers recognized the need for collaboration and support, which refers that suppliers understand the value of collaboration as all companies are in a similar path facing the sustainability regulations and expectations. Findings also indicated that especially smaller size suppliers would desire to have training, assistance, or economic assistance in order to improve and achieve better sustainability performance. It would be beneficial for ABB to fulfill these expectations about resources and training which would help suppliers to improve their sustainability performance.

4.4.4 Overview of the findings

The findings of this study highlight that a holistic approach to sustainability enables improve sustainability performance. Suppliers should approach sustainability through environmental, social, and governance aspects. The most important sustainability factors to improve sustainability performance are use of green energy, waste management, and stakeholder management. These three factors were identified from EcoVadis data and interview data. Improved sustainability performance helps to achieve the benefits identified. In addition, findings emphasize the importance of support and cooperation within global supply chain. Figure 12 summarizes the findings.

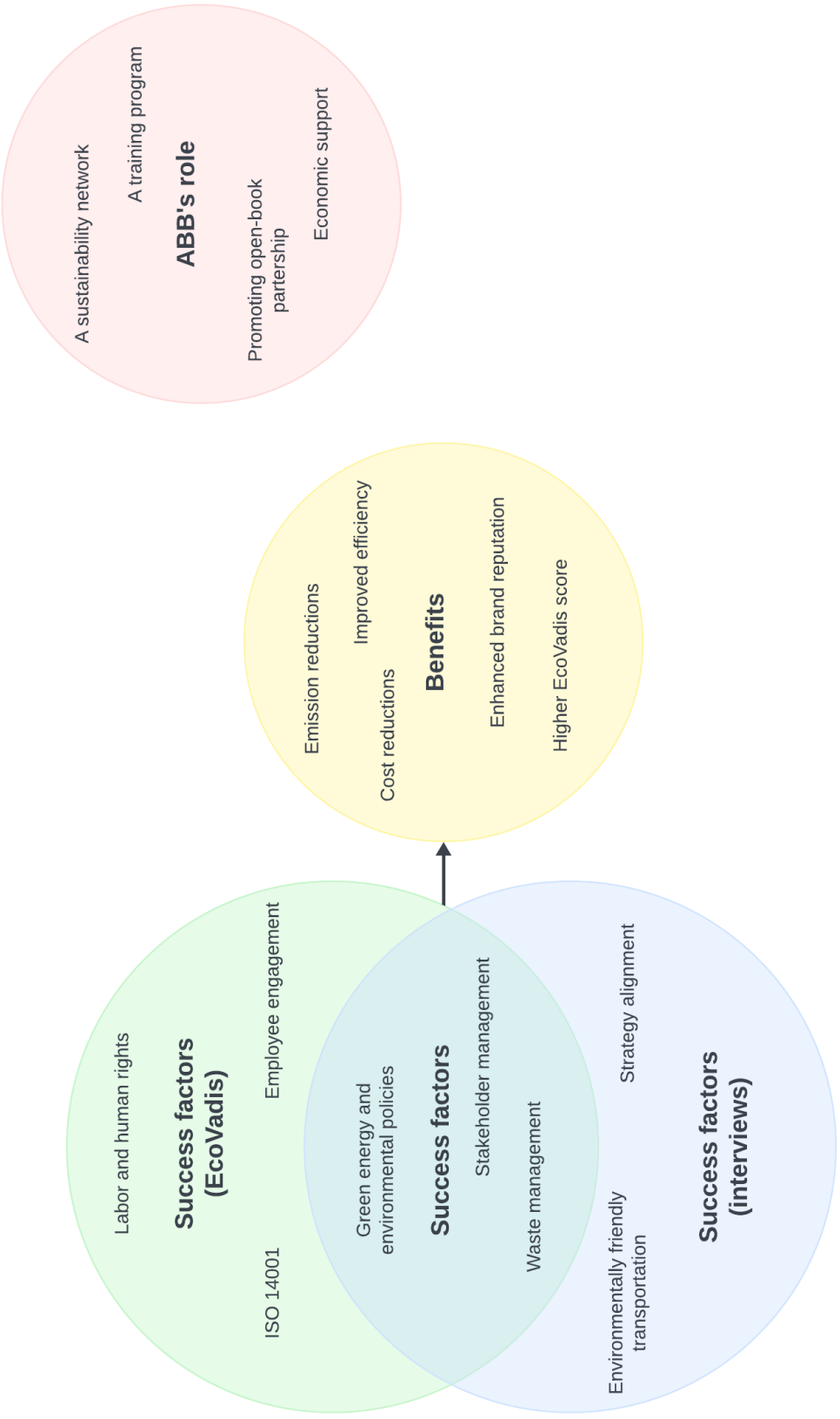

Figure 12. Summary of the findings and recommendations.

4.5 Recommendations for suppliers

Based on the findings of this study, a framework for improving suppliers' sustainability performance can be developed. The framework is based on the identified success factors, including all three sustainability dimensions: environmental, social, and governance. By applying the framework, suppliers can improve their sustainability performance, achieve higher EcoVadis assessments, and gain the identified benefits.

Environmental sustainability of the framework includes the success factors that were identified in environmental category. Framework suggests that Smart Power's suppliers should develop a roadmap towards ISO 14001 certification, change to renewable energy sources such as solar or wind power, develop policies for energy and GHG emissions reductions, implement systems for regular monitoring and reporting of energy consumption, improve waste management practices, expand recycling initiatives and improve circular economy approach, and explore more sustainable transportation methods such as electric vehicles or optimized logistics.

Social sustainability of the framework includes the identified success factors of social category. According to the framework, suppliers should develop and improve DEI policies, prevent child and forced labor and human trafficking by regular audits and tightening policies, invest in health and safety programs, improve employee skills by implementing continuous learning and development programs, demand standardized labor policies across all operations, conduct regular reviews on individual performance, and foster collaborative environment for sharing knowledge and best practices.

Governance sustainability of the framework includes the three success factors identified in governance category. The key focus areas for suppliers should be implementing anti-corruption policies, conducting regular assessments for suppliers, and align sustainabil-

ity strategy with customers' expectations to support the joint sustainability journey. Figure 13 presents the framework. Figures 14, 15, and 16 present each sustainability dimension, its success factors, and concrete steps forward.

Environmental sustainability factors	Social sustainability factors	Governance sustainability factors
ISO 14001 certification	DEI policies	Anti-corruption policies
Use of green energy	Child labor, forced labor & human trafficking policies	Supplier assessments
Energy and GHG policies	Employee health & safety policies	Customer-aligned sustainability strategy
Energy consumption reporting	Skills development training	
Waste sorting and disposal	Labor and human rights issues standard policy	
Recycling practices	Individual performance assessment	
Sustainable transportation methods	Stakeholder collaboration	

Figure 13. Sustainability framework for Smart Power's suppliers.

Environmental sustainability factors	Step forward
ISO 14001 certification	Develop a roadmap towards ISO 14001 certification
Use of green energy	Change to renewable energy sources such as solar or wind power
Energy and GHG policies	Develop policies for energy and GHG emissions reductions
Energy consumption reporting	Implement systems for regular monitoring and reporting of energy consumption
Waste sorting and disposal	Improve waste management practices
Recycling practices	Expand recycling initiatives and improve circular economy approach
Sustainable transportation methods	Explore more sustainable transportation methods such as electric vehicles or optimized logistics

Figure 14. Environmental factors and steps forward.

Social sustainability factors	Step forward
DEI policies	Develop and improve DEI policies
Child labor, forced labor & human trafficking policies	Prevent child and forced labor and human trafficking by regular audits and tightening policies
Employee health & safety policies	Invest in health and safety programs
Skills development training	Improve employee skills by implementing continuous learning and development programs
Labor and human rights issues standard policy	Demand standardized labor policies across all operations
Individual performance assessment	Conduct regular reviews on individual performance
Stakeholder collaboration	Foster collaborative environment for sharing knowledge and best practices

Figure 15. Social factors and steps forward.

Governance sustainability factors	Step forward
Anti-corruption policies	Implement anti-corruption policies
Supplier assessments	Conduct regular assessments for suppliers
Customer-aligned sustainability strategy	Align sustainability strategy with customers' expectations to support the joint sustainability journey

Figure 16. Governance factors and steps forward.

4.6 Recommendations for Smart Power

Based on the finding for the research question 3, suggestions for Smart Power can be developed. The suggestions include creating a collaborative sustainability network, developing a training and assistance program, promoting open-book partnerships, and economic collaboration. A collaborative sustainability network could include regular meeting and workshops with suppliers to discuss sustainability challenges, best practices, and collaborate. In practice, this could refer to organizing workshops or meetings for example quarterly or every six months, or creating a virtual forum or platform where suppliers can share their progress and challenges. Developing a training and assistance program could include webinars, workshops, and online resources to help suppliers understand and implement sustainability calculations, regulations, and practices. For example, launching a series of monthly webinars on relevant sustainability topics, such as GHG scopes and EcoVadis assessments. This training and assistance program could be developed especially for small size suppliers who lack the internal resources. Promoting open-book partnerships refers to partnership agreements and transparent communication. Open-book partnerships with suppliers would foster trust and collaborative problem-solving. Economic collaboration refers to incentive programs and financial support. The economic challenges suppliers face when investing in sustainability could be facilitated through providing financial incentives or agreeing to pay higher prices for sustainably produced goods. Figure 17 presents the suggestions for Smart Power.

Create a collaborative sustainability network	Develop a training and assistance program	Promote open-book partnerships	Economic collaboration
Regular meetings and workshops between Smart Power and suppliers to discuss sustainability challenges, share best practices, and collaborate.	Webinars and online resources to help suppliers understand and implement sustainability calculations, regulations, and practices.	Partnership agreements and transparent communication to trust and collaborative problem-solving, and share information.	Incentive programs and financial support to support and motivate suppliers to invest in sustainability.

Figure 17. Suggestions for Smart Power.

5 Conclusion

This study aimed to identify the key success factors of suppliers' sustainability, the benefits suppliers have derived from investing in sustainability, and how Smart Power can support suppliers in improving their sustainability performance.

Research questions:
RQ1: What are the suppliers' sustainability success factors?
RQ2: What are the benefits suppliers have derived from investing in sustainability?
RQ3: How can Smart Power support suppliers' sustainability path and therefore maximize mutual value?

The findings indicated 17 key success factors in total divided into environmental, social, and governance categories. Additionally, suppliers reported four key benefits derived from their sustainability investments: emission reductions, cost savings, enhanced brand reputation, and improved efficiency. The findings also highlighted the importance of collaboration, training, and economic support from Smart Power to help suppliers improve their sustainability performance.

5.1 Reflection on the research process

The research process involved analysis of EcoVadis assessments and semi-structured interviews with Smart Power's suppliers. The mixed-methods approach enabled for a thorough understanding of the factors driving sustainability among suppliers, the benefits suppliers detected from their sustainability investments, and expectations for collaboration and support. Integrating quantitative and qualitative data provided a wide view of the sustainability among Smart Power's suppliers. Reflecting on the research process, it was necessary to combine secondary data (EcoVadis assessments) and primary data (interviews) in order to identify and validate the key sustainability success factors, the benefits, and the need for support.

5.2 Recommendations for future research

Based on this thesis, future research could aim to explore the following:

1. Conduct longitudinal research to evaluate the long-term impact of sustainability initiatives on suppliers' performance.
2. Compare the sustainability success factors and benefits across different industries to identify industry-specific drivers and challenges.
3. Use larger sample sizes and quantitative methods to validate the findings and improve generalizability.
4. Examine the impact of governmental and regulatory policies on suppliers' sustainability practices.

5.3 Contribution

In conclusion, this study identified success factors that improve Smart Power's suppliers' sustainability performance, highlighted the benefits suppliers can achieve through sustainability investments, and surveyed ways Smart Power can support their suppliers. The findings highlight the importance of a collaborative approach between Smart Power and its suppliers to improve sustainability performance. By addressing the identified success factors suppliers can improve their sustainability performance and gain benefits identified in this study. By providing the necessary support, Smart Power can help its suppliers overcome sustainability challenges. The thesis achieved its aims by providing guidance on how suppliers can improve their sustainability performance and identifying benefits to motivate suppliers to invest in sustainability.

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