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DEFINING KEY SUSTAINABILITY INDICATORS FOR ASSESSING SUPPLIERS' SUSTAINABILITY PERFORMANCE: A CASE STUDY

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TIIVISTELMÄ

Lappeenrannan–Lahden teknillinen yliopisto LUT
School of Energy Systems
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Olennaisimpien kestävyysindikaattorien määrittäminen toimittajien kestävyyden arviointiin: tapaustutkimus

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Yritysten lisääntynyt ulkoistaminen ja sen tuoma toimitusketjujen monitahoisuus ovat korostaneet kestävän toimitusketjun hallinnan roolia yritysten vastuullisuustyössä. Useissa organisaatioissa kestävän toimitusketjun hallinta ja sen käytännön toteutus ovat kuitenkin vielä alkutekijöissään, kun taas akateeminen tutkimus tarvitsee lisää tietoa sekä vastuullisuuden että kestävän toimitusketjun laajojen käsitteiden käytännön tason toteutuksesta. Tämän diplomityön tavoitteena oli selvittää, mitkä olisivat olennaisimpia kestävyysindikaattoreita kolmelle ennalta määritetylle hankintakategorialle arvioitaessa toimittajien vastuullisuutta tapausyrityksessä. Lisäksi työssä tutkittiin edistävätkö tapausyrityksen hankinnan nykyiset toimittajien vastuullisuusarviointiin käyttämät työkalut yrityksen globaalin yritysvastuustrategian toteutumista. Tämän tapaustutkimuksen tulokset saatiin käyttämällä sekatutkimusmenetelmää, joka koostui strukturoidusta asiantuntijakyselystä, puolistrukturoidusta toimittajakyselystä sekä puolistrukturoidusta asiantuntijahaastattelusta. Tutkimustulokset osoittivat, että keskeisimpien kestävyysindikaattorien määrittäminen eri ostokategorioiden näkökulmasta on haastavaa johtuen kestävyysindikaattoreiden suuresta määrästä ja tarvittavasta tietotasosta valintojen perustelemiseksi myös yritysvastuustrategian näkökulmasta. Teräs ja elektroniikkakomponenttien osalta tärkeimmät indikaattorit korostivat päästöjen vähentämistä ja kierrätysmateriaalien lisäämistä, kun taas toimitilapalveluntarjoajien osalta sosiaalisen vastuun kysymykset muodostivat valtaosan tärkeimmiksi koetuista indikaattoreista. Tutkimustulosten perusteella työssä esitettiin kolme vaihtoehtoista tapaa hyödyntää työssä määritettyjä kestävyysindikaattoreita tulevaisuudessa korostaen samalla myös tarvetta kehittää toimittajien vastuullisuusarviointia jo toimittajien valintavaiheessa tapausyrityksen globaalin yritysvastuustrategian ja sen tavoitteiden edistämiseksi.

ABSTRACT

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Defining key sustainability indicators for assessing suppliers' sustainability performance: a case study

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82 pages, 17 figures, 10 tables and 5 appendices

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Keywords: Sustainable supply chain management, sustainability indicators

The increasing trend of companies' outsourcing activities and the complexity of the global supply chains have started to underline the role of sustainable supply chain management (SSCM) in companies' corporate responsibility work. However, the execution of sustainable supply chain management practices is still in the development phase in many companies while academic research needs more studies on how to implement the broad concept of sustainability and SSCM operationalized at a practical level in businesses. This Master's Thesis aims to define what are the key sustainability indicators for three determined purchasing categories to assess suppliers' sustainability performance in the case company and whether the current tools of the case company's procurement to evaluate suppliers' sustainability enhance the execution of the whole corporate sustainability strategy. The results of this case study were obtained by using a mixed study methodology including a structured expert questionnaire, a semi-structured supplier questionnaire, and a semi-structured expert interview. The study results showed that the definition of the key sustainability indicators from each purchasing category's point of view is a challenging task due to the existence of several sustainability indicators and the needed level of knowledge to justify the selections also from the corporate sustainability strategy perspective. In the steel and electronic components categories, the most valued indicators highlighted the reduction of emissions and increase the use of recycled materials whereas in the facilities service providers category social issues accounted for most of the top-ranked indicators. Based on the study results, the study proposed three alternative ways how to utilize the determined sustainability indicators in the future while it also emphasized the need for a more ambitious supplier sustainability assessment already in the supplier selection phase to support and drive the whole corporate sustainability strategy more effectively forward.

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What an incredible five years in LUT – I don't even know where to start because there are so many people, I would like to give my thanks and a warm hug that they were part of my journey. But this is for you all – thank you, you made my study experience more awesome and unforgettable than I could ever imagine. The spirit of Skinnarila is not a legend - it is a real phenomenon where there is a space for everyone to start to flourish and have the feeling of being part of this great LUT community, as they are.

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Espoo, 24th of May 2022
Anni Herttuainen

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LIST OF ABBREVIATIONS

KPI Key Performance Indicator

LCA Life Cycle Assessment

LUT Lappeenranta University of Technology

SCM Supply Chain Management

SSM Supplier Sustainability Management

SSCM Sustainable Supply Chain Management

1 INTRODUCTION

According to the FIBS' Corporate Responsibility study (2021), during the past two years, the corporate responsibility work in Finnish companies has undertaken a dramatic change. The study underlines that corporate responsibility work in Finnish companies is nowadays more strategic, more targeted, and more organized than ever before. The responsibility topics are being discussed regularly in the companies' boards and already 76 % of the companies have their own director or manager assigned for corporate responsibility. (FIBS 2021.) It seems that the peer pressure to other companies' sustainability work, public pressure of limiting global warming to 1.5 degrees and the coming regulations related to corporate sustainability, to mention a few, have accelerated the development of corporate responsibility work with unprecedented force. However, there is still one pain point in the many companies' management of responsibility work, and that is truly sustainable supply chain management. As stated by Liu et al. (2015, 2789) due to the increase of outsourcing activities, the organizations have become more contingent on their supplier performance as well.

Even though many companies have set very ambitious targets in terms of corporate responsibility and reducing the negative climate impacts, still, the reduction targets related to climate impacts, for instance, focus mainly on Scope 1 and Scope 2 emissions. In many times, the companies' targets exclude or limit the Scope 3 emissions that would take into consideration the whole value chain emissions, not only the Scope 1 and 2 emissions from the companies owned and managed activities, and the electricity use (Figure 1). Whereas the reasons of companies excluding the impacts of the value chain might differ, especially in the case of large companies, supply chains are today so complex and fragmented to all over the world, the visibility and management beyond Tier 1 can be very hard or even impossible. Also, whereas the knowledge and maturity level of sustainability topics in Finnish companies, for instance, is relatively high, still many companies, especially in lower income countries, need much more support and guidance in all areas of sustainability. Thus, it's time for the leading companies to show their commitment to being responsible for, not only towards their own operation but the whole value chain.

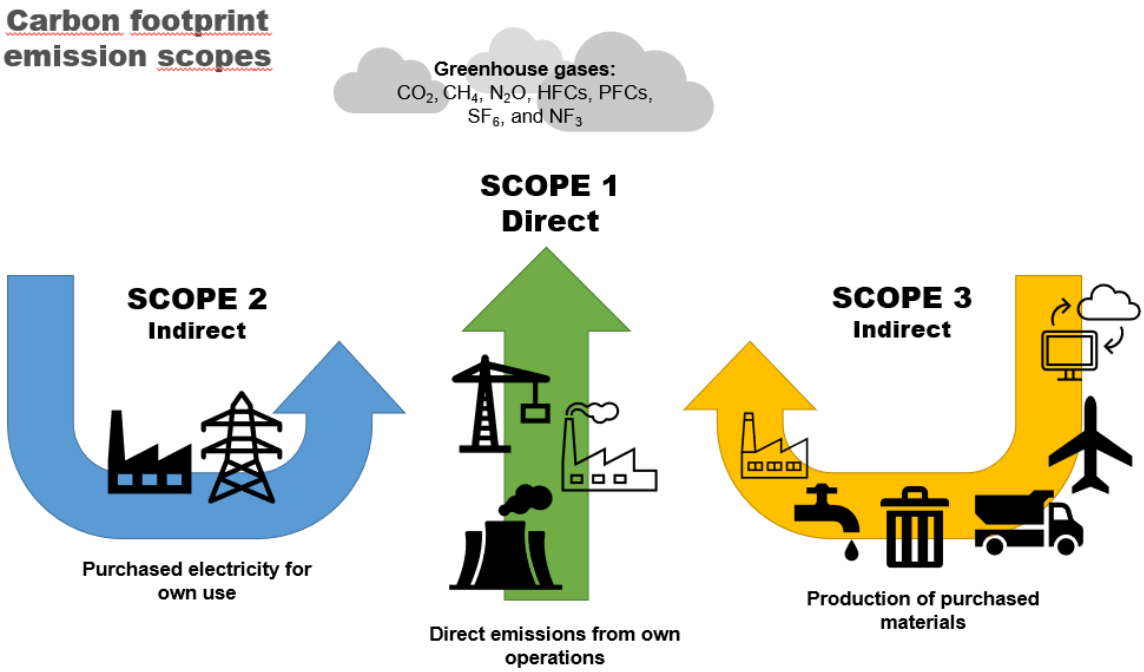

Figure 1. Carbon footprint emission scopes (adopted from the WBCSD & WRI 2004, 26).

1.1 Background and justifications

Supplier assessment is a decision-making process that companies need to conduct not only in the initial stage of the supplier search and selection but also in the supplier monitoring phase to be able to assess the development of the supplier performance in the long run. (Verdecho et al. 2013, 577.) The increasing trend of companies outsourcing their activities to third parties has led to the situation where supply chains have become the critical factor in companies' success. While tighten regulations and increased stakeholder pressure has forced companies to focus more on environmental and social improvements both in the company's own activities as well as in their supply chains, the integration of these sustainability pillars to actual purchasing practices is far from being a simple task. In addition to supplier's evaluation in terms of sustainability, the buyers should still, as a priority in many companies, be able to purchase goods and services from the suppliers that can offer the competitive price, the best quality, and the flexibility to the company. (Zimmer et al. 2015, 1412.)

Also, as discussed in a study conducted by Fritz et al. (2017), even though sustainability has become a significant topic from product design to post-consumer product management across several sectors, still, its applications which would be embedded in companies' supply chain management (SCM) have been lagging behind the development. While, for instance, the life cycle assessment (LCA) study, is nowadays quite commonly used method to evaluate the impacts of a certain product or service, it is argued that conducting such an assessment, for example, at a supply chain level would be very complex, time-consuming, and as the LCA study is often based on secondary data, would give just an approximate of the possible impacts of the selected entity. (Fritz et al. 2016, 587-588.) Needless to say, the difficulty of the supplier sustainability management (SSM) from the methodological point of view is truly existing since all three dimensions of sustainability include both qualitative as well as quantitative factors. Therefore, the assessment of the suppliers' sustainability performance, can be defined as a multi-criteria decision problem for the companies as well as other organizations. (Verdecho et al. 2013, 578.)

This thesis is conducted as an assignment for one of the Finnish listed companies. The company has taken a huge leap in its corporate responsibility and sustainability work during recent years, however, mainly focusing on the company's own activities. Now, the development and implementation of sustainability work are wanted to be seen also on the company's procurement and the supply chain side. Currently, the case company segments and classifies its suppliers based on their performance in the most critical areas but the key performance indicators (KPIs) are missing sustainability aspects. Hence, this study aims to establish a baseline for the development of evaluation criteria in terms of sustainability as well.

The motivation for this thesis topic has come from the idea of speeding up the change towards a more sustainable business by focusing on the company's supply chain and its role in the company's responsibility work. The complexity of the topic results from the varied and fragmented supplier base of the many multinational companies and therefore, the grouping of suppliers based on their industry or service is likely to be needed. To exemplify the problem in practice, it might not be meaningful to evaluate the sustainability performance of the supplier who's manufacturing the steel structures with the same indicators as the

supplier who's providing the cleaning service at the facility since the sustainability risks related to these suppliers differs from each other. While generalization is usually made for sake of simplicity it might not always come up with the best result.

1.2 Objective and research questions

The overall objective of this master's thesis is to enhance the procurements' responsibility work in the case organization by considering sustainable aspects better as a part of the supply chain decision-making process. More specifically the aim of this thesis is to define the most relevant indicators according to which monitor and evaluate suppliers' sustainability performance in the case organization. The indicator in the thesis refers to a certain question of which result indicates the state or the level of the certain issue in question. The indicators shall be defined in a way that can be easily measured on regular basis without a need for extensive resources. When talking about sustainability, the thesis excludes the economic dimension of sustainability since the company already follows selected economic indicators with its suppliers. Thus, the main goal of this thesis is to determine sustainability indicators regarding environmental and social issues which would also support the overall suppliers' performance evaluation alongside the indicators that are already in place for economical evaluation.

The thesis targets to form a set of indicators also respecting the different sustainability risks between the suppliers working in the different industries. Hence, the thesis studies three different purchasing categories of the case company aiming to determine the indicators specifically subject and relevant for each purchasing category alone. In order to form a basis for the study, the thesis reviews and disclose what are the current ways to evaluate suppliers' sustainability performance in the case company and whether those are in line with the whole company's sustainability strategy. Finally, the thesis outcome should enclose the suggestion on how to improve the tracking of suppliers' sustainability performance in the future with the determined indicators or some other way.

The four research questions for the thesis are:

1. What are the current ways to evaluate suppliers' sustainability performance in the case company's procurement and how well those are in line, with the case company's corporate sustainability strategy?
2. What are the priority sustainability indicators for the case company to monitor and evaluate with its suppliers that operate in different industries?
3. What is the ability of suppliers to provide sustainability-related data and what is their sustainability performance based on the determined indicators?
4. What are the main development actions to enhance the procurement's tracking of suppliers' sustainability performance in the future?

1.3 Study methodologies and structure of thesis

This thesis is a case study within a real-life context organization, and it contains elements from both qualitative and quantitative research methodologies. The thesis has two main sections: the literature review and the empirical case study part. The literature review is conducted by first reviewing previous research publications from the field of corporate sustainability and sustainable supply chain management and secondly going through the case company's own sustainability strategy and procurement sustainability practices. The literature review will create a theoretical framework for the latter part of the study, present the study context and indicate whether there are any gaps in the current research that have studied the topic.

After the literature review, the thesis studies sustainability performance indicators through the empirical case study part. In the empirical case study part, the most relevant sustainability performance indicators for the case company are determined by conducting an expert survey through a questionnaire. The questionnaire aims to indicate what are the most important indicators to be asked from each purchasing category's suppliers, and based on the received results, the set of indicators will be pilot tested with selected suppliers through a self-assessment questionnaire. At the end of the empirical part, the expert interview is yet held to get an even deeper understanding and insights on how to develop the suppliers' sustainability performance as well as result indicators from the study in the future. Finally,

the thesis gives implementation suggestions for the case company on how to use the studies indicators in the future embedded in the case company's business processes.

The structure of the thesis is presented in the figure 2 below.

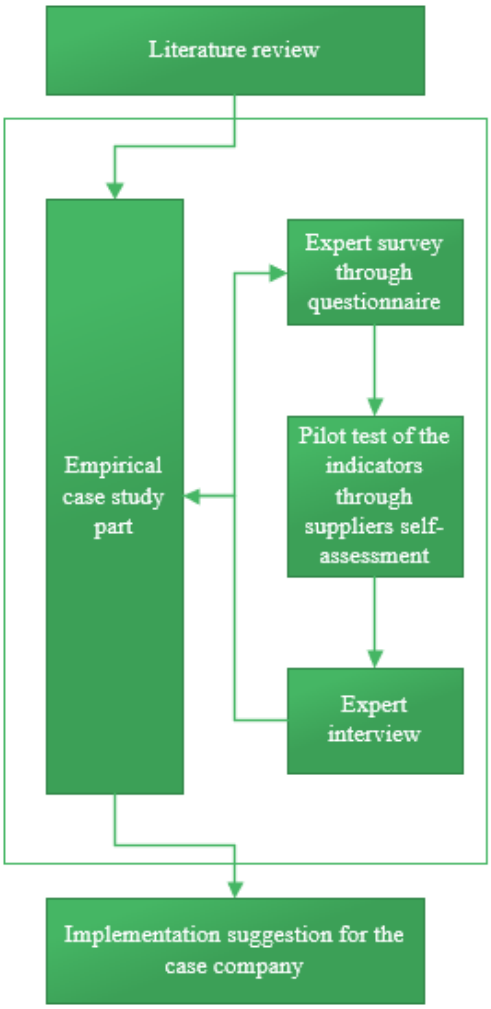

Figure 2. Structure of the thesis.

2 LITERATURE REVIEW

In this chapter, this study aims to form a theoretical basis for the concepts of corporate sustainability and sustainable supply chain management in order to apply those concepts also in the latter part of the study. This chapter represents the literature review of the study and hence, will be based on current academic literature on the themes.

2.1 The history behind the current need for true corporate sustainability

In order to understand why in 2021, there is so much talk about corporate sustainability, it must be to look behind into history and discuss the reasons why human society is now suffering, not only from the climate crisis but also from unacceptable social problems, especially in the developing countries. The time after the Second World War in the 1950s was a time of great prosperity for the Western World countries. People, not only the richest and privileged segment, started to achieve the wealthy living standards including, for example, the first computers, air flights, antibiotics, and plastic commodities that replaced the wood and natural textiles. Raw materials such as steel and aluminium became the standard materials for different applications and have been important resources for many industries since then. A big step took place in the energy sector where the use of energy grew rapidly, and crude oil became the most important source of energy across the world. The overall phenomenon of that time was that many of the things that seemed impossible for human society before suddenly became available at reasonable prices leading people to though that the economic growth would be unstoppable. Even if expectations towards continuous growth were increased among Western countries, the rueful reality was very unequal for other regions that are still known today as “developing countries”. (Bardi 2011, 5-6.)

Nevertheless, not all believed in continuous growth but realized that the earth was finite. When the first photos of the earth taken from space in the 1960s showed that the planet was a ball-shaped giant organism, it was clear that there is only limited space for all. Consciousness started to lead to further investigations. Marion King Hubbert, who was an American geologist, suggested in the 1950s that the production curve for crude oil should be

"bell-shaped" as the resources were exploited fast and weren't endless. In the 1960s, James Lovelock developed the concept of "Gaia" describing the planetary ecosystem, where all creatures were linked together in a complex system of feedback that enabled the Earth's temperature to be tolerable for life. Even the threat of global warming was seen already in 1957 by Robert Revelle and Hans Suess, who published a study that illustrated how the increase of carbon dioxide resulting from human activities would eventually rise up the planetary temperature. (Bardi 2011, 6-9.) One could think that how it is possible that even though humans predicted the consequences of continuous growth and use of natural resources, extremely little effort was made to change the path of this undesired development?

The above-mentioned question could be explained with an interesting but realistic model created by Garret Hardin in 1968. Hardin's paper "*The tragedy of the commons*" described a case where there is a land, as a common good for all shepherds to use as a pasture and growing animals. Even though each shepherd understands that pasturing too many animals destroys the land, still, all of the shepherds tend to add more animals into one's herd as the individual advantage received is seen as larger than the damage due to the collective loss. As a result, the land is badly damaged, but even then, it is still convenient for each shepherd to overexploit to even the very last patches of pasture remaining. (Bardi 2011, 7.) Hence, if the same theory of human behavior is embedded into the capitalist economy and business, in fact, it is no wonder that efforts to protect the common planet haven't been really seen as a priority action among the competitive corporations but more as a drawback that leaves space for other companies to take the advantage of.

2.2 Research definitions for corporate sustainability

The first definitions of corporations have been referred as follows: "*The firm is a "black box" operated so as to meet the relevant marginal conditions with respect to inputs and outputs, thereby maximizing profits, or more accurately, present value*" (Jensen and Meckling 1976, 306). In other words, a classical view in finance states that companies are entities that pursue to maximize the profit and market value for themselves as well as their shareholders to whom the company is responsible. However, in recent years, the other view of companies has become even more widely accepted. That view states that companies and

their management have also, responsibility beyond profit which can be considered "corporate sustainability". According to Sheehy and Federica (2021, 11), corporate sustainability finds its roots already in the 1970s, when severe environmental disasters took public attention and led to the establishment of "corporate environmentalism" which at that time still, excluded the social concerns.

Nowadays corporate sustainability can be explained by using various definitions. Sheehy and Federica (2021) explained corporate sustainability using two levels of sustainability: "weak corporate sustainability" and "strong corporate sustainability". The weak corporate sustainability focuses on both environmental and social impacts but only to that extent, it has a positive long-term effect on corporate financial performance. Strong corporate sustainability, in turn, includes also legal and governance structures that identify planetary limits and the ecological boundaries that limit the economy as well as human rights and other social issues. (Sheehy and Federica 2021, 11.)

Elsewhere Dyllick and Muff (2016) presented not the exact term of corporate sustainability but "business sustainability" with four different levels starting from "business as usual" towards "business sustainability 1.0" and "business sustainability 2.0" finally defining true business sustainability as a "business sustainability 3.0". The framework approaches the different concepts by using a general business process model. In the framework, the inputs define the main concerns and issues that the business decides to focus on (what?), the process part focuses on different organizational perspectives the business takes (how?), and the outputs finally highlight the values the business desires to create (what for?). (Dyllick and Muff 2016, 4.) The framework is illustrated in table 1.

Table 1. Concepts for business sustainability (adopted from Dyllick and Muff 2016, 13).

Business Sustainability Concept	Business concerns (what?)	Values created (what for?)	Organisational perspective (how?)
Business-as-usual	Economic concerns	Shareholder value	Inside-out
Business sustainability 1.0	Three-dimensional concerns	Refined shareholder value	Inside-out
Business sustainability 2.0	Three-dimensional concerns	Triple bottom line	Inside-out

Business sustainability 3.0	Starting with sustainability challenges	Creating value for the common good	Outside-in

In order to understand the difference between these above-presented concepts, a more specific explanation is likely to be needed. Firstly, the concept of business-as-usual describes the business thinking that focuses on the economic concerns above. That means the business concentrates purely on economic aspects such as cheap resources and efficient processes to achieve a strong economic position in markets which results in profit or shareholder value. The business perspective is strongly inside-out with a strong profit business perspective as a basis for business. The secondly introduced concept, business sustainability 1.0, shifts the concerns of business to take into consideration also economic risks related to environment and social issues. Even though these environmental and social risks are embedded in internal processes and decision-making, the base motivation of business is still to safeguard the value created for shareholders. (Dyllick and Muff 2016, 8-9.)

The third concept, business sustainability 2.0 can be aligned to one of the definitions determined for corporate sustainability by SAM Group and PricewaterhouseCoopers in 2006 by stating that: "*Corporate sustainability is an approach to business that creates shareholder value by embracing opportunities and managing risks deriving from economic, environmental and social developments*" (Dyllick and Muff 2016, 8). Thus, business sustainability 2.0 takes a clear development step from the shareholder value to the 'triple bottom line'. The 'triple bottom line' term is sometimes used as one way to describe sustainability, but in fact, is a business concept coined by John Elkington in 1997. The idea of the triple bottom line approach is to expand companies' responsibility from solely generating profit to measuring its impacts also to the environment and society. These three dimensions are referred to as profit, people, and the planet as illustrated in figure 3. (Miller 2020.) Therefore, business sustainability 2.0 can be considered as one way to manage the triple bottom line through advisedly defined goals and programs. As a result, the value created for people and the planet is not any more a side-effect of business or a consequence of certain risk management activities which are only related to economic performance. (Dyllick and Muff 2016, 9-10.)

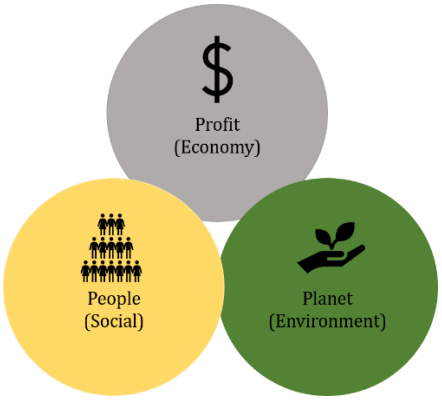

Figure 3. The concept of triple-bottom line.

The final concept of business sustainability 3.0, or in other words truly business sustainability, in turn, broadens the organizational perspective shifting the view from inside-out to outside-in. That signifies that the final aim of the business is to solve the challenges of the external environment where it operates, and instead of minimizing the negative impacts, it desires to make a significant positive impact using the resources and competencies. The concept of true business sustainability also sees critical challenges as a business opportunity which is reflected in the company's strategic vision and new business models. Furthermore, one of the main differences in true business sustainability compared to other concepts described is that companies operating at a truly sustainable business level consider themselves more like responsive actors in society while serving a common good is, in fact, a base value for organizations which operate a truly sustainable business. (Dyllick and Muff 2016, 10-11.)

One common term often used in the context of companies' sustainability or responsibility work is also 'ESG'. According to Hedstrom (2018, 23), the wave of ESG took place around 2005 when the investment community woke up to carbon risks and started to use the term 'ESG' which refers to environmental, social and governance factors that impact the investment to a company. In contrast to that time's widely used concept of triple-bottom-line (figure 2), the ESG concept started to focus also to the governance part by replacing the concept of 'profit' that had been anyway rarely discussed in the TBL context. Despite the promising development of ESG, it left out still one important part – strategy. Hence, nowadays sustainability is often seen as a companies' stewardship in the areas of

environmental and social responsibility, supported by governance that enables the successful implementation of the company's sustainability strategy. (Hedstrom 2018, 23.)

To summarize, as stated above corporate sustainability has gathered many definitions around it whereas different definitions place different expectations on how companies make business and take the environment and society into account. It is therefore advisable to look at the company's values and motives on a case-by-case basis in order to understand what corporate sustainability really means to each company individually. The concept developed by Dyllick and Muff (2016), for instance, is one tool to evaluate the level of ambitiousness and the drivers of corporate sustainability whereas not the only one in the field of fragmented corporate sustainability research.

2.3 Sustainability in corporate supply chains

Companies' desire for outsourcing activities has grown significantly during the last decade, and based on statistics, companies outsourcing activities have been directed largely on suppliers located in developing countries or emerging economies such as China and India. That has enabled companies to change their cost structure in a positive direction resulting in cost savings and increased profitability (Lee and Rammohan 2014, 439). However, it has come with a price for the environment and society. There has revealed serious evidence that especially in low-cost countries, working conditions can be extremely poor and dangerous, and in most severe cases there might even occur children labour. Also, there have been more undesired situations related to environmental pollution caused by companies manufacturing activities which wouldn't be even acceptable in Western Countries due to the legal liability that companies have. (Sancha et al. 2019, 1.) To ensure that these risks and challenges that outsourcing has brought to companies will be noted as well as managed, sustainable supply chains and sustainable procurement plays an increasingly important role as one pillar of companies' sustainability work.

2.3.1 Sustainable supply chain management

According to Meixell and Luoma (2015, 70), "*Sustainable supply chain management (SSCM) extends the basic concept of supply chain management by broadening performance*

to consider sustainability dimension as in the triple bottom line". This definition also imitates the widely used definition by Seuring and Müller (2008, 1700) that describes the SSCM as: "*The management of material, information, and capital flows, as well as cooperation among companies along the supply chain, while taking goals from all three dimensions of sustainable development into account*".

If the sustainable supply chain management is seen to perform well on all dimensions of the triple bottom line, then, SSCM can be defined in accordance with Pagell and Wu (2009, 38) as "the specific managerial actions that are taken to make the supply chain more sustainable with an end goal of creating a truly sustainable chain". For achieving and fulfilling the sustainability requirements of the various stakeholders, these managerial actions ensure that the company establishes and defines certain practices and principles, for instance, for its purchasing and supply chain function or centralized procurement. As a result, sustainable supply chain management might involve many practices such as sustainable product design, sustainable supplier selection and evaluation, sustainable production as well as sustainable transportation (Li et al. 2019, 606).

It is hereby worth mentioning that Sustainable Supply Management (SSM) practices differ from traditional purchasing or SCM practices, by taking a wider perspective that takes also social and environmental aspects into consideration in addition to economic values. Whereas taking into consideration environmental and social aspects enable companies to manage their sustainability-related risks such as reputational risks or environmental risks, it also provides an opportunity to develop practices needed to achieve a high level of sustainability in the overall company. For example, if a company have capabilities and willingness to collaborate with the supplier in terms of improving the supplier's manufacturing capabilities and, thus reducing the waste, the company can benefit from its improved environmental performance which again increases the company's overall sustainability performance. (Kähkönen et al. 2008, 519-520.)

In an ideal situation, where the supply chain could be described as a truly sustainable supply chain, even in the worst situation, it would cause no net harm to natural or social systems while still producing a profit over an extended period of time. Fundamentally, this means

that if customers have a willingness, the truly sustainable supply chain could continue doing business forever. Even though this kind of example of a truly sustainable supply chain or even chains does not exist today, it has been already shown that in the same industry, those companies that have more sustainable supply chains are able to continue business longer than the other companies, that do not perform that well in the same area. (Pagell and Wu 2009, 38.) Therefore, the importance of continuous improvement in the area of sustainable supply management can't be neglected as it is a crucial aspect for companies that wish to perform excellently also on a long-term basis.

However, despite all the above-mentioned topics, the goal of finding the most efficient and appropriate way to manage the supply chain in terms of sustainability is not an easy task while efforts to preserve the environment and society might easily cost an arm and a leg for companies who don't have a longer-term perspective in their business strategy. For example, in their article Wu and Pagell (2011, 577) discuss that "while waste and pollution reduction are aligned with the traditional goals of operations management, not all environmental practises will bring cost savings while some will even increase costs, especially, in the short term". After saying that, Wu and Pagell (2011, 577) take an example in the investments in green technology that might take a long time before those start to pay off for the company. That puts even the most experienced management in front of the extremely challenging task of changing the business system and supply chains to meet the needs of the environment and society while preserving successful business outcomes. Nevertheless, that change is both unavoidable and necessary.

2.3.2 Existing practises to manage sustainable supply chain

During the last years, researchers have been increasingly interested in the management of sustainable supply chains. As an example, Zailani et al. (2012, 331) present the 'House of SSCM' originally developed by Wittstruck and Teuteberg (2010, 1002) where sustainable supply chain management is illustrated with the framework of a house. The idea is that the foundations of the building incorporate risk and compliance management as well as laws, standards and regulations which are the minimum requirements for all companies to address in business. The building leans on three pillars which are environmental performance, economic performance, and social performance where each of those pillars is needed to be

in place to keep the building in balance. On top of the building, the roof brush is being formed with three layers that supplement the house of successful sustainable supply chain management.

The first roof layer, the sustainable supply chain strategy requires the establishment of the company's values and ethics, in other words, business conduct, that is aligned throughout the organization, and which covers also the third layer, the organizational culture. The second layer, IT alignment stresses the importance of the IT network which is highlighted as one crucial factor to measure the performance of each pillar and by that enable the development and smooth information flow in the organisation. (Zailani et al. 2012, 331-332.) Originally Wittstruck and Teuteberg (2010, 1002) have also presented the risks related to the environment and market through flash pictures but nowadays, there are also several other risks (for example, social and compliance risks) that speak for the importance of sustainable supply chain management. The Wittstruck and Teuteberg (2010, 1002) framework is presented in figure 4.

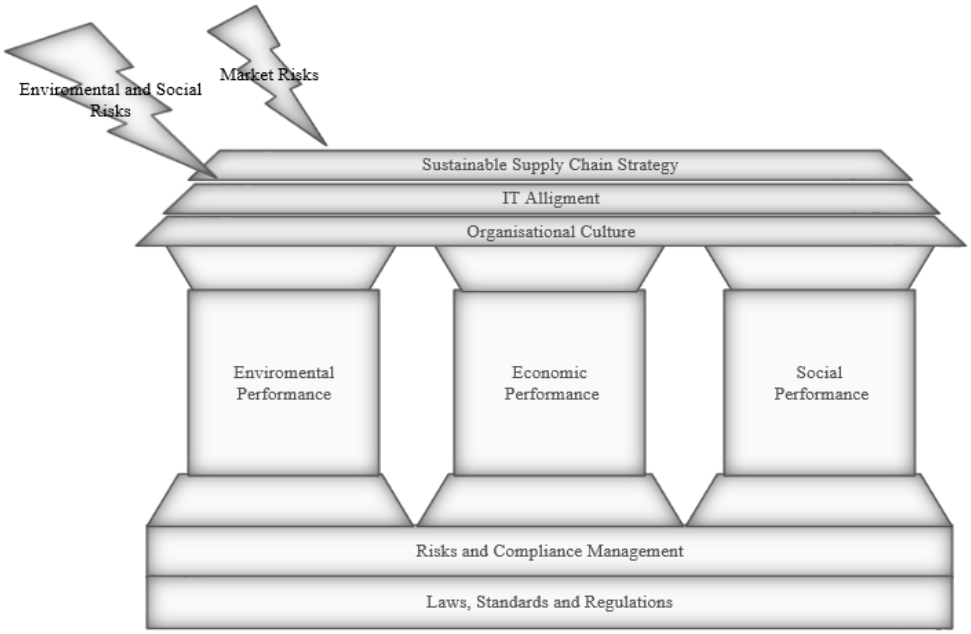

Figure 4. House of Sustainable Supply Chain Management (adopted from Teuteberg & Wittstruck 2010, 1002).

In the other article, Lee and Rammohan (2017) discuss the usefulness of the sense and response framework which goes to a more practical level and thus can be more useful,

especially for companies that haven't established sustainable supply management practices yet. According to Lee and Rammohan (2017, 442), "*the framework can be applied to continually evolving social, environmental, and ethical issues in global supply chains*". The framework is also defined as a management tool for managing risks and unpredictability in operations (Kapoor et al. 2005). Figure 5 below illustrates the framework by Lee and Rammohan (2017).

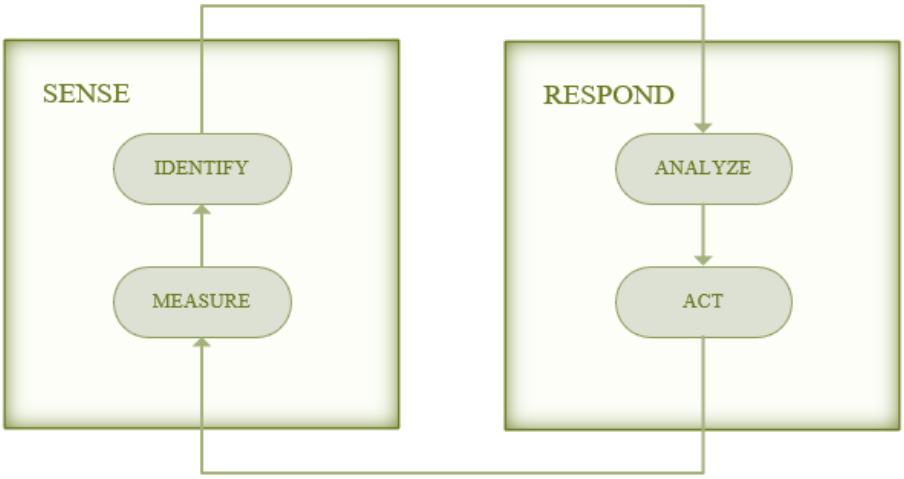

Figure 5. Framework of sense and respond (adopted from Lee and Rammohan 2017, 442).

The framework imitates the two governance structures to manage supplier responsibility: assessment and collaboration which are herein described as dimensions of sense and response. The 'sense' refers to the need of the buying company to gain visibility of its supply chain and possible issues there. After recognizing the current state by measuring and identifying issues it is then time for the buying company to 'respond' by analysing the issue and taking actions. In order that enables continuous improvement, the framework can be then used multiple times in a row. (Lee and Rammohan 2017, 442.)

In their article, Lee and Rammohan (2017, 443-444), also list the practices through which buying companies can gain more 'sense' of activities and impacts on the supply chain and what are the commonly used practices to 'respond' to the findings. The practices are listed in table 2 below.

Table 2. Practises to follow sense and respond framework (adapted from Lee and Rammohan 2017, 442-443.)

Practises to gain "sense"
Traceability = the ability to trace the points of origin of materials used in a product
Visibility = knowledge of social, environmental, and ethical performance of suppliers
Monitoring = the action of examining supplier performance
Practices to "respond"
Reactions to violations once they have occurred (e.g., root cause analysis, and penalties such as fines, supplier warning, reduced business, contract termination)
Incentives (e.g., preferred supplier status, increased business, price premium)
Supplier capacity building (e.g., productivity improvement and capability expansion)
Proactive product and/or process design (e.g., design for the environment)
Shared value chain strategies (e.g., extended value creation through community development)
Cascading responsible practises to the supplier network (e.g., training and motivating suppliers to adopt incentives, capacity building, and design principles to improve the sustainability of their own supply network)

First, traceability is an important basis to gain knowledge on where is the origin of materials that the company is buying. Basically, traceability means knowing the suppliers of materials that the company have been sourced. However, investigating where the exact origin of the materials is, has been proven to be a very challenging task for many companies operating in global multi-tier supply chains. For example, a lot of conflict minerals are mined in Eastern Congo where the violations of human rights are well known. At the same time, the achieving traceability of Conflict Minerals origin hasn't been always that successful. Therefore, there has emerged a true urge to establish many international efforts to avoid the trading of conflict resources. (Lee and Rammohan 2017, 443-444.)

Visibility, in turn, as presented in table 2 follows traceability while its purpose is to increase knowledge of suppliers' sustainability performance. However, according to Lee and Rammohan (2017, 444-445), this isn't an easier task for companies to tackle and based on '*The Chief Supply Chain Officer Report 2012*' only ~25% of respondents from companies' representatives state, that they have had visibility in environmental or social violations in their companies extended supply network (Lee et al. 2012, 30). Therefore, to enhance the visibility, Lee and Rammohan (2017, 445) present three mechanisms for companies to use in order to increase their visibility on suppliers. Firstly, buying company can ask suppliers to share data directly which, however, usually requires a high degree of trust and a

collaborative relationship. Secondly, the buying company can directly monitor their suppliers, for instance through audits. Or thirdly, buying companies can gain knowledge by reviewing reports made by other interested parties meaning for example NGOs.

Lastly, in terms of the sense phase, monitoring refers to an action that detects the supplier's performance, and it can take place already in the supplier qualification process which is usually done before the actual contracting process. Also, the supplier can be monitored through audits by the company itself or by a third-party auditing company. However, it should be stressed that while the Audits are a very widely accepted mechanism to evaluate suppliers' conformance to each company's code of conduct, the research has been suggested that the effectiveness of Auditing as a 'sense' tool alone is being limited. (Lee and Rammohan 2017, 445.)

While the supplier monitoring itself has been stated to have only limited effectiveness, the other dimension of the framework, 'response', includes the additional practices to motivate suppliers to improve their social and environmental practices. Some companies use penalties such as fines, supplier warnings of reduced business or contract termination while other companies have established incentives such as increased business, supplier recognition, better terms and conditions as well as training and awareness-raising to motivate suppliers. Especially training has been used also as one form of collaboration and capacity building for suppliers that might not have the same know-how the ways how to improve their sustainability performance. (Lee and Rammohan 2017, 445-448.)

Moreover, proactive product and/or product design, such as "design for the environment" techniques are used to reduce the negative environmental impacts on the environment (Lee and Rammohan 2017, 449), and to ensure the remanufacturing and resource efficiency during the product's designing phase (Zheng et al. 2019, 217-218). Design for the environment usually refers to a definition of ecological design or life-cycle design but can be also extended to include sustainable product design of design for sustainability by taking into consideration the social and economic issues (Zheng et al. 2019, 208). In the context of a sustainable supply chain, the improved product/process design can be seen as an action to increase suppliers' processes resiliency against sudden cost shocks and other external

disturbances which are shown to consequence sustainability violations more easily (Lee and Rammohan 2017, 449; Chen and Lee 2015, 2810).

The finally mentioned response tool is a shared value through which extended value creation and community development as well as cascading responsible practices to the extended supply network are highlighted. The shared value network refers to the idea that the buyer delivers value to suppliers, workers, and ultimately to communities. On the one hand, it can be considered the highest level of sustainability but, on the other hand, also a growing aim and interest among the leading companies. Cascading of responsibilities, in turn, tries to affect the supply chain also by pushing more responsible practices from tier-one suppliers onwards using a kind of domino effect. That means that once the supplier notices the importance and positive effects of maintaining the sustainable performance of its own supply chain, it is more willing to use similar 'response' strategies as the buyer company and then the effect is recurring finally enabling even more suppliers to tackle their sustainability issues. (Lee and Rammohan 2017, 449-450.)

2.3.3 Suppliers' sustainability performance and assessment

For a long time, supplier performance evaluation considered only economic criteria and metrics such as cost, quality, delivery, and service reliability. By the end of the 2020 century, global pressure for organizations to transit toward a sustainable way of operating has not only, forced companies to evaluate their own sustainability performance, but also their suppliers' sustainability performance. In 2006, Schaltegger and Wagner (2006, 2) defined sustainability performance as a performance of a company measured by all dimensions of sustainability (economic, environmental, and social) and for all drivers of corporate sustainability. Sustainability performance also affects the current change of companies pursuing their operations from corporate certifying, compliance and reporting to meeting the stakeholder expectations which are nowadays significantly more demanding in relation to sustainability. However, the measurement of sustainability performance is not straightforward when the issues that are wanted to be measured keep changing and developing constantly. (Sebhatu 2009, 3.)

Even though indeed, traditionally companies' buyers' purchasing decisions have been primarily based on the quality and price of purchased goods, as well as purchasing risks and delivery conditions, nowadays suppliers' sustainability conditions should be also one factor to be evaluated. Buying companies' shareholders have started to exert significant pressure on buying companies to manage their global supply chains in a social and environmentally responsible manner. (Busse et al. 2016, 443.) Even though assessing the sustainability performance of a given company is already challenging, extending the assessment to also cover the company's supply chain is even more complex since it requires the development of some level of leverage, trust and collaboration between the partners in the supply chain while not forgetting suitable technical tools (Schöggl et al. 2016, 822). Hence, the company's sustainability indicators need to be assessed in a meaningful way to improve the company's decision-making, define the strategic orientation and acknowledgement the possibilities for efficiency improvements (Gunasekaran et al. 2004, 333).

When extending sustainability requirements upstream in the supply chain, different interactions between the buying companies and suppliers take place through the implementation of the practices such as performing audits on the suppliers' environmental and/or social performance, or collaboration, in the form of training and audit results sharing. The assessment itself is one kind of transactional practice that is usually considered an arm's length approach. By assessing and evaluating suppliers, buying companies can identify whether their suppliers meet, for instance, expected sustainability criteria and standards or not. After the assessment, the assessment process entails the buying company's communication with the supplier. Communication includes the introduction of the assessment results as well as giving guidance for improvement to better meet to expectations of the buying company. (Sancha et al. 2019, 2)

According to Cox (2004, 351-352), an arms-length approach in the buyer-supplier relationship refers to a way of working where the buyer and supplier choose to make few dedicated investments in their relationship and operate on a fairly short-term contractual basis. That can explain the lack of effectiveness of the audits, which was already stated by Lee and Rammohan (2017, 445) since the motivation of suppliers to meet the expectations of the buying firm can be relatively low if the contractual basis of the relationship is not

based on long-term cooperation. In addition, the study conducted by Sancha et al. (2019, 7) showed that in the context of a developing country (China in the study), the supplier assessment resulted even in the negative impacts on suppliers because of the cost of implementing the new practices to meet buying companies' sustainability expectations had to be paid by the supplier itself.

That said, research has also shown, in contrast, that the assessment can be effective and result in positive impacts as well as increased sustainability performance when it is combined with collaboration practices. Particularly effective results in suppliers' sustainability performance can be seen when the supplier is highly dependent on the buying company. (Sancha et al. 2019, 7). That can be explained by the buyers' power relative to the supplier which affects significantly many actions such as suppliers' revenue in the relationship dominated by the buyer company (Cox 2004, 352). That motivates suppliers to invest in sustainability practices required by the buying company, as the supplier perceives that it can enable advantages like longer-term business relationship with the buying company as well as increased sales and capabilities through supplier training (Sancha et al. 2019, 7).

Overall, Fraser et al. (2020) mention in their article several reasons that support suppliers' sustainability assessment. Since companies face increasing expectations toward their responsibility, they need measures, processes, and tools through which they can identify possible risks in their supply chains, enhance the sustainability performance of their supply chains and guarantee continuous improvement within their supply chains. All these aspects then, contribute to and affect the successful implementation of companies' sustainable supply chain management and companies' broader sustainability strategies. Nevertheless, even if the importance of supply chain assessment has been acknowledged, there seems to be a clear need for more research that would consider "how to?" assess suppliers' sustainability. (Fraser et al. 2020, 128-130.)

2.3.4 Self-assessment as a tool to measure suppliers' sustainability performance

Even though many multinational corporations have been started to present their approaches toward supply chain sustainability in their sustainability reporting, as mentioned above, Fraser et al. (2020, 128) argue that there seems to be a clear gap between the theoretical

academic literature research on SSCM, and SSCM in practice. Das (2017, 1345) defines that the main question of SSCM as one academic discipline is "*how to make the broad concepts of sustainability relevant, applicable and operationalizable to SCM at firm level*". According to Dubey et al. (2017), supplier assessment is one of the tools within the area of performance assessment in the world-class supply chain management framework (Dubey et al. 2017, 339) and therefore, supplier self-assessment can be considered an important tool to integrate the sustainability to the companies' operational practises, such as supplier evaluation.

Using supplier self-assessment has also challenges that need to be brought up when planning its use. The supplier self-assessment has received criticism as a tool, for example, related to the fact that the respondents (suppliers) can desire to give a too positive impression of their activities which is called social desirability bias. The social desirability bias also appears as a behaviour another way around resulting those individuals tending to underestimate the undesired actions, they might be involved in. That can lead for instance un-reporting of actions that the respondent feel is undesired from the perspective of the questioner. Moreover, an individual tendency to social desirability should also be kept in mind in the sense of the fact that often self-assessment questionnaire is filled by one individual on behalf of the whole company. (Fraser et al. 2020, 130-131; Chung and Monroe 2003, 291.)

Other possible issues of supplier self-assessment that Fraser et al. (2020) are discussing in their article include, for example, the concern regarding supplier fatigue towards several different supplier assessments they need to fill as per request from many stakeholders. In addition, the responses might be affected by the questionnaire design, construction and process, the language used as well as the country differences. (Fraser et al. 2020, 131.) As an example, one interesting finding that Chung and Monroe (2003, 299) found in their research was that "individuals who are more religious tend to understate their intentions more than less religious individuals do". Hence, it might be possible that countries with more rooted religiousness amongst people can have more tendency to social desirability bias than those countries where people with religion are a minority. All these perspectives need to be addressed before the decision of using the supplier self-assessment tool through the careful identification of possible pros and cons. In the research field, there is supporting research on

the benefits of supplier self-assessment but not that many alternative tools are proposed against the drawbacks.

2.3.5 Benchmarking best ways to evaluate suppliers' sustainability performance

According to Kumar et al. (2006, 294) "*benchmarking is the process of identifying, understanding, and adapting outstanding practises from organizations anywhere in the world to help an organization improve its performance*." Thus, benchmarking is used in this study to investigate whether other companies or organizations have outperforming practices on how to evaluate their supply chain sustainability performance with selected, outperforming indicators. Furthermore, the benchmarking was also especially targeted to find more information on existing ways to use supplier self-assessment tools in supplier evaluation.

Based on the study review on publicly available websites it has to be admitted that not much transparent information about the companies' practices on how to evaluate their suppliers' sustainability performance with specific indicators does not yet exist. For example, more information would have been valuable to get on the question of whether the companies require suppliers to report their emissions and waste amount at a detailed level or are performance indicators more related to the existence of certain policies and practices. Though, there was a clear sign that the importance of a topic has been on the table, since there is much evidence of companies using, for instance, supplier assessment questionnaires to measure their suppliers' sustainability performance. As an example, Philips (Royal Philips) uses a supplier assessment questionnaire to evaluate their suppliers' performance in the areas of quality, environment, health & safety, business ethics, and human capital. Based on the results and supporting evidence, Phillips creates a supplier scorecard, informs the supplier about the results, and decides the next step in accordance with the classification of the supplier. (Philips 2018.) The classification of suppliers is presented in table 3.

Table 3. An example how Philips classifies suppliers based on supplier assessment questionnaire results (adapted from the Philips 2018).

Supplier classification category	Actions towards supplier
BiC – Best in Class	Suppliers are very mature in terms of sustainability and do not require actions from Philips side, need to complete self-assessment on annual basis
SSIP – Supplier Sustainability Improvement	Strategic suppliers to Phillips but lower sustainability maturity level, need to conduct an on-site assessment to verify actual situation while Philips supports and trains to increase awareness of sustainability topics
DIY – Do it Yourself	Suppliers' maturity level is sufficient, Philips supports suppliers with cross-learning and sharing information peer-to-peer in a supply network
No Zero Tolerance	Suppliers need to achieve the minimum requirements, no specific further actions (if zero tolerances are being found Philips takes immediate actions to mitigate and resolve the issue)

On the other hand, for example, the Responsible Business Alliance (RBA) disclose that the supplier self-assessment questionnaire plays a starting point and a critical step before the audit in the factory engagement programmes of the Responsible Factory Initiative (RFI), to evaluate supplier performance against the RBA Code of Conduct (Responsible Business Alliance n.d.). In addition, the Finnish company Valmet Oyj has established a four-phase Supplier Sustainability management process where supplier self-assessment is part of the process for the selected suppliers that haven't managed well enough in the Valmet's supplier sustainability risk assessment shown. Also, what is notable is that all the suppliers are to be required evaluated through the sustainability risk assessment process. Valmet supplier sustainability management process is shown in figure 6 below. (Valmet n.d.)

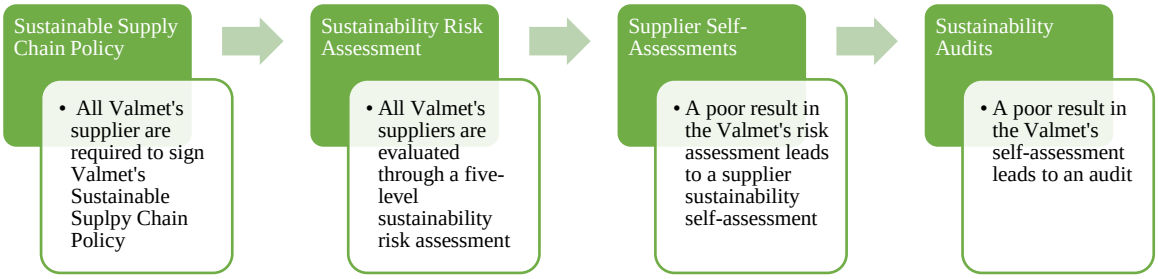

Figure 6. Valmet's global supplier sustainability management process (adapted from the Valmet n.d.).

Furthermore, EcoVadis, a leading sustainable rating provider evaluates suppliers through the digital supplier assessment which has been proved a successful concept since the popularity of EcoVadis among businesses has increased significantly in recent years. In 2017, EcoVadis rated 35 00 companies through their assessment whereas, in 2020, the number of rated companies was already 75 000 (EcoVadis n.d.). Nevertheless, even indicators that EcoVadis uses to evaluate the suppliers in terms of sustainability, are not publicly available without the user investing in the actual rating.

As an additional finding, another typical approach on how companies evaluate their suppliers' sustainability performance is to join common responsibility initiatives of several companies. Companies involved in the initiatives can operate in different fields of businesses but there are also many sectoral specific initiatives among companies that are operating in the same industry and typically have a large supplier base extended to multiple countries. These initiatives enable companies to share performance data such as the Together for Sustainability (TfS) initiative does and hence, helps the member companies like UPM to decide for which suppliers they want to perform an on-site audit (Norjama, 2020). The sectoral Initiatives also aim to mutualize audit results among the member companies which for its part, decreases the audit fatigue of suppliers (Initiative of Compliance and Sustainability n.d.).

It seems that based on the benchmarking study, companies' approaches to supplier evaluation differ from each other whereas it is clear that the need for evaluation and assessment of supply chains has increased, as the EcoVadis risen in popularity has shown. Many companies report their supplier monitoring but more transparency should be established because supplier sustainability monitoring is not only a one-company issue. The ultimate goal of supplier sustainability monitoring is, however, to increase the sustainability of global supply chains, and for speeding up the transformation it should be beneficial for every organisation to combine the forces and share the best practices and knowledge on how to develop sustainability in supply chains while mitigating the supplier fatigue due to increasing need for more information.

3 THE STUDY CONTEXT

In this chapter, the aim is to get familiarized with the study context of this thesis and to understand how corporate sustainability and its dimensions have been integrated into the case company's business. The case company's introduction will be based on both its external and internal information given. Also, the determined research subjects: the three selected purchasing categories will be justified based on the sustainable challenges stated in the literature. Later on, this section will be used to define a comparative baseline for the first research question.

3.1 Introduction of the case company

The case company Konecranes is a Finnish multinational corporation operating in the Lifting Industry where it provides lifting solutions as well as services for all kinds of lifting equipment. In 2020, the group sales were 3.2 billion euros in total while the group had approximately 16 900 employees working in 50 different countries all over the world. On their website, the company describes itself as follows:

"*With our knowledge, products, services and solutions we seek to maximize the positive contributions to our different stakeholders and the surrounding society. We create value for our stakeholders on multiple fronts: through circular economy, digitalization, and our deeply rooted safety culture. (Konecranes, 2021a)*"

Reviewing the company's strategy, it is based on five cornerstones which are growth, profitability, customers, people, and technology. Especially best profitability compared to industry peers and strong market growth are highlighted to be very important targets that company believes can be achieved through a world-class customer experience and satisfaction, innovative offering, and employee engagement. (Konecranes, 2021a)

3.2 Corporate sustainability in the case company

The corporate sustainability in Konecranes is observed through the external material available on the company's website and by reviewing the newest sustainability report from the year 2020. Konecranes sees that in order to continue successful business in the future, it has to be able to help its customer to shift to a low-carbon future, accelerating circularity with new advanced low-carbon and energy-efficient technologies. In addition to circularity, the other important benefit in terms of sustainability is safety, which is described to be deeply rooted in the company's culture. Sustainability is an increasingly important factor for the Konecranes as it has become a more and more relevant topic to its customers, finances as well as the company's own employees. Moreover, Konecranes believes that if it can set a clear purpose and understanding of the impacts it can make as a company, those will be also clear engagement factors for the company's current and future employees. (Konecranes 2021b, 6.)

The company has five sustainability cornerstones that are presented in figure 7 below. The process for defining the five selected cornerstones has considered the expectations of the key stakeholders and megatrends that have impacted the company's business. To identify also the issues that Konecranes can make a positive impact on, the company has compared their efforts to UN Sustainable Development Goals. That has resulted in the conclusion that the most relevant sustainability topics for Konecranes are sustainable offering and circularity, climate action and resource efficiency, safe workplace and products, diverse, inclusive, and engaging workplace, and responsible business conduct. (Konecranes 2021b, 6.)

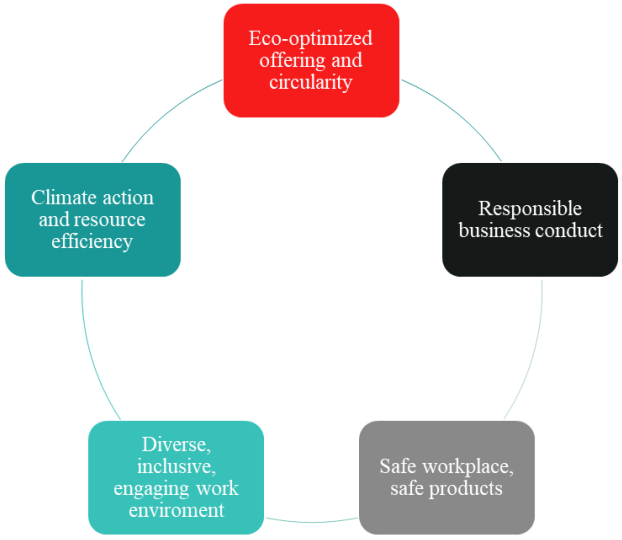

Figure 7. Five sustainability cornerstones of Konecranes (adapted from the Konecranes 2021b, 6).

3.3 Current tools for suppliers' sustainability evaluation in the case company

To fulfil the responsibility that Konecranes has in its supply chain, the procurement organizations need to follow its suppliers' base compliance related to legal, ethical, environmental, and other sustainability obligations. Its responsibility is also to set the requirements and processes for procurement that support the previously mentioned issues, which is also one driver for giving this thesis topic to be searched. One clear challenge for supplier management, also in terms of sustainability topics, is the company's extensive global supplier base that Konecranes mentions in its sustainability report. Hence, the company states that at least currently its sustainability management in relation to suppliers is focused on Tier 1 suppliers. (Konecranes 2021b, 39-40.)

In its sustainability report, Konecranes presents a few sustainability managements approaches that the company has for different areas in question. About the responsible supply chain, Konecranes has listed the following approaches/tools/processes/risk mitigation activities, which support fulfilling its principles of setting the standards for responsible business conduct expected from its suppliers: Supplier Code of Conduct which is including corporate responsibility requirements that are expected to be fulfilled by third parties, due diligence and background checks, and Supplier Code of Conduct Audits.

Elsewhere in the sustainability report, the company also states that procurement conducts around 100 on-site process audits based on risks identified beforehand. These audits are conducted on annual basis and account for sustainability-related topics of 20% of the standards points which are checked during the audits. Therefore, annual audits can be considered to contribute also to the evaluation of the suppliers' compliance related to key sustainability topics. (Konecranes 2021b, 14;40.)

The case company has also a publicly available 'Global Supplier Manual' where the company defines the minimum requirements for all suppliers and subcontractors. Related to sustainability topics, as a part of the new supplier onboarding process, the case company requires its suppliers to be compliant with the Konecranes Supplier Code of Conduct and suppliers are also being required to disclose some sustainability-related information as a part of background check or due diligence documents. Moreover, one of the sub-processes of the Supplier Qualification process is also Supplier Code of Conduct Audits. However, Supplier Code of Conduct Audits are only conducted for the selected supplier groups based on country, industry, or supplier-specific risks and if only about 30 audits are done each year, not nearly all suppliers get audited. The case company's supplier onboarding process is illustrated in figure 8. (Konecranes 2021c.)

Figure 8. Key steps of Konecranes' supplier onboarding process (adopted from the Konecranes 2021c).

After the new supplier has been onboarded to the company, the supplier will be categorized and segmented internally. According to the segmentation level, basic rules for the relationship will be formed. Otherwise, based on the case company's 'Global Supplier Manual' there are no other sustainability topics mentioned in the supplier performance evaluation that belong to the supplier relationship management process, presented in figure 9, that follows after the supplier has been onboarded to the company. Hence, all the tools for supplier sustainability evaluation tools in case company's procurement are summarized in figure 10. (Konecranes 2021c.)

Figure 9. Key steps of Konecranes' supplier relationship management process (adopted from the Konecranes 2021c).

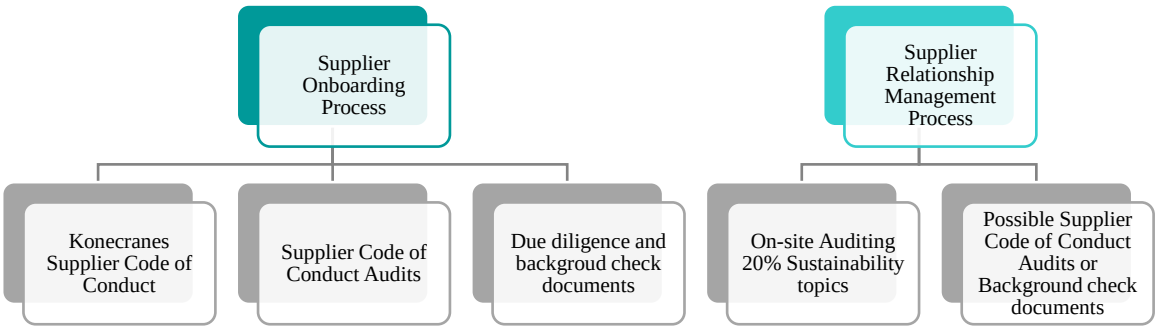

Figure 10. Key tools of the case company to evaluate suppliers in terms of sustainability (adopted from the Konecranes 2021c).

Considering the overall study context presented in this chapter including the case company's corporate sustainability strategy and current tools for sustainable supply chain management, it can be stated that when utilizing the theoretical framework by Dyllick and Muff (2016), the case organization could be placed within the concept of business sustainability 2.0. The case organization already clearly embraces and manages the risks delivered by its operation while also seeing the opportunities that it can create for its stakeholders. However, to achieve true business sustainability 3.0, the case organization need to strengthen their sustainability work throughout their operations from more sustainable raw material sourcing to delivering the most sustainable products to the customer and thereby, solving the sustainability challenges at every stage of its whole product value chain. Dyllick and Muff's (2016) framework may not fit as such to be applied in this case study but can be used to exemplify the case company's current business sustainability maturity level, and later on in the evaluation of whether this study strengthened the case company's movement towards the business sustainability 3.0.

3.4 Sustainability risks related to selected case company's purchasing categories in the scope

Three case company's purchasing categories to be examined in the empirical part of this thesis were determined together with the case company's representatives. Three selected purchasing categories for the case study part of the thesis are steel, electronic components and assemblies (hereinafter referred to as electronic components category), and facility service providers (hereinafter referred to as facilities category). The steel category refers to suppliers that are producing either raw steel material or machined parts for the case company while excluding big steel structures which are usually subcontracted. In the electronic components category, the focus is on commercial electronics producers. Finally, within the facilities category, the scope is on suppliers that are providing outsourced labour to the case company's own facilities. (Konecranes 2021d)

In order to justify the selections and indicate different main emphases of the areas of concern within the different categories, the main sustainability risks are briefly investigated. Moreover, the more specific knowledge on sustainability risks resalted to each selected purchasing category can direct to take into account also some category-specific risks that might not be mentioned in general supplier sustainability questionnaires or research but can be seen as important to the case company, in terms of future development. Still, it has to be noted that these sustainability risks are only a part of overall sustainability risks that contribute to these purchasing categories though the main trends are aimed to be discussed.

3.4.1 Sustainability risks related to purchasing of steel material

Steel is very significant raw material for the case company in terms of the company's own products' manufacturing (Konecranes 2021d). It is also a raw material that is highly emission-intensive to produce due to its reliance on coal. On average, producing one ton of crude steel results in 1,4 tons of direct CO_2 emissions. The major concerns in steel production are related to the gas emissions and the energy use of the blast furnace- basic oxygen furnace (BF-BOF) route that accounted 71% of steel production and 90% of primary production in 2019. Even though the other technology, steel scrap- electric arc furnace (scrap based EAF)

has much lower emissions compared to BF-BOF route, it cannot be used with similar scale, since only limited amount of recycled steel scrap is available for production. (International Energy Agency 2020, 29-43; Nidheesh & Kumar 2019, 862.) Hence, even if the emission intensity of scrap based EAF is much lower, the production technology cannot be used with a limitless scale which poses an even greater challenge to the steel industry. To exemplify the impacts between the different production routes, the carbon dioxide emission intensities of three main production routes are presented in table 4 below.

Table 4. CO_2 emission and energy intensities of a main production routes calculated by International Energy Agency (IEA) methodology. (Adapted from the International Energy Agency 2020, 42-43)

Methodology	BF-BOF	Scrap-based EAF	Natural gas-based DRI-EAF
IEA (direct)	1.2 t CO_2/t	0.04 t CO_2/t	1.0 t CO_2/t
IEA (direct+indirect)	2.2 t CO_2/t	0.3 t CO_2/t	1.4 t CO_2/t
IEA (energy intensity)	21.4 GJ/t	5.2 GJ/t	17.1 GJ/t

In addition to energy intensity and carbon dioxide emissions, there are also other environmental impacts such as stack emissions that are widely regulated by the legal emission limit values and therefore needs to be monitored. Since there are naturally occurring heavy metals in raw materials, those can be released into the air from flue gases, stockpiles, and slag heaps as well as contaminated scrap and coal that might result in contaminated soil. Steel manufacturing also needs significant quantities of water for different processes including cooling, descaling and dust scrubbing. However, the local water availability affects the fact that water intake and consumption can be taken as a concern. (International Energy Agency 2020, 43-44.)

3.4.2 Sustainability risks related to purchasing of electronic components

Electronic components are another critical part of the case company's own products, and the importance of electronic components will be assumed to be even higher in the future when the electrification of new products takes place (Konecranes 2021d). While the case company plans to increase the sales of new electrified products, the need for electrification will also impact several other industries simultaneously due to its role in the reduction of GHG emissions (Teknologiateollisuus 2022), and therefore, competition for finite and critical resources accelerates at a rapid pace. That causes new challenges regarding environmental

degradation and fragility as the production of electronic components requires rare earth metals forcing the industry to focus on the recyclability of products and components. One limiting factor of recyclability of electronic components, however, is the complexity and mixing of materials which makes it more difficult to recover all valuable materials. (Balkenende and Bakker 2015, 3-4.) Despite the current challenges in recyclability, according to Balkenende and Bakker (2015, 6) "*recycling is essential for all electronic products, irrespective of their use and associated business model*".

Another aspect that should be considered is the production processes of electronics. Usually, traditional technologies used in the manufacturing of electronics are based on stripping away material throughout the process generating waste. (Hakola, 2020) In addition, as stated in the research conducted by Qiao (2017, 3584), CO2 emissions from the production of electric vehicles can be even 59% to 60% higher than the production of internal combustion engine vehicles, mainly due to Li-Ion batteries and additional components such as transaction motor and electronic controllers used in electronic vehicles. Therefore, CO2 emissions can be considered an important issue to measure and reduce, especially, in the production stage, also within the electronic components industry.

Furtherly speaking, in recent years there has been quite much attention also around conflict minerals issue. According to Finnish Safety and Chemicals Agency (Tukes) conflict minerals include tin, tantalum, tungsten and gold and these minerals are found in large volumes in the African Great Lakes Region and specifically in the Democratic Republic of the Congo (Tukes n.d.). Even though the minerals can hold a large potential for development, those can as well, due to revenues, cause several conflicts or continuation of violent behaviour in the high-risk areas. This topic is very important to mention as the minerals which are extracted in conflict zones are used largely in the production of electronics. Hence, European Union, for instance, hopes to tackle the problem of financing armed groups in conflict zones with the revenue of conflict minerals by setting a certain requirement for companies that are importing those minerals above a certain threshold. (Finnish Safety and Chemicals Agency n.d.) That puts buying as well as using companies of conflict minerals in a very critical position in terms of responsibility to trace where the conflict minerals are being sourced and how to take care of the mitigation of negative impacts.

3.4.3 Sustainability risks related to purchasing of facilities services

The rapid growth of outsourcing has led to the complexity of global supply chains resulting in the situation where the risk of slavery and forced labour in global supply chains has grown to be significant. Therefore, both nongovernmental organizations (NGOs) and the social auditing industry are working closely together with corporations in order to enhance "slavery-proof" supply chains. Although not all outsourced labour work is involving forced labour it has been shown the evidence that subcontracting leads to lower labour standards and reduced rights for workers the reason that subcontracting is still somewhat unauthorized and unregulated. Also, the target that large corporations hope to meet by outsourcing is usually fast turnaround times with low cost leading for example excessive overtime of workers. (LeBaron 2014, 237-243.) Hence, it is critical for companies to take action and responsibility for the rights of workers and overall human rights in their supply chains as well.

As discussed in the paper of Mosher and Mainquist (2011, 37) whenever there is a problem that occurs, and those inevitably will, the organization itself, not the outsourcing firm will be responsible for a problem or violation regardless of where and by whom it has occurred. And when purchasing facilities in this thesis' scope refer to, for instance, outsourced cleaning and security services as well as canteen services which takes place in the case company's own facilities, the findings of uncompliant working practices, if found, will be even further emphasized. In recent years, labour violations have been also increasingly leading up to the headline news, damaging the company's brand image as a responsible business maker. For instance, The Guardian wrote in July 2021 that Research by Clean Clothes Campaign had found Primark, H&M and Nike failed to ensure the full wages were paid to garment workers in Indonesia, Cambodia, and Bangladesh during Covid-19 Pandemic (Johnson 2021) and it is probably only a matter of time when other industries will be started to be investigated as deeply regards of workers' violations as for example the clothing industry is at the moment.

The challenge in the case of facilities category is the evaluation of, especially, social issues while those cannot be monitored by numerical values but rather by the existence of certain

policies and procedures. However, even if the company would disclose that it has all the subject policies and procedures in place, it is extremely challenging to find evidence regarding, for example, child labour or other severe human rights violations without actually going to observe the working practices and actual evidence. Still, it matters that customer organizations are evaluating such issues to communicate the importance and relevance of those issues.

4 METHODOLOGY

The research strategy of this thesis represents a case study which is an in-depth inquiry into a topic or phenomenon within its real-life setting. So-called ‘case’ in the case study may signify for instance a person (such as a manager), a group (such as a working team), an organization (such as a business) or an event (such as an annual event) whereas in this thesis a ‘case’ refers to an organizational unit, case company’s procurement. Since the research only studies one organizational unit, it is a single case study where, however, within the same organizational unit, there are three sub-unit selected and analyzed resulting embedded case study. Case studies are nowadays quite a widely used research strategy and therefore, those can be designed in several ways to best match the purpose of the case study which was also the reason why the case study strategy was chosen for this thesis. Since the research of this thesis is conducted in a certain, quite short period of time to study a particular phenomenon, the research can be also called cross-sectional study. (Saunders et al. 2015, 184; 200.)

In this thesis, the research methodology utilizes the mixed methodology combining elements from different research methodologies. According to Creswell and Plano Clark (2007, 165), “*a mixed-methods study involves the collection or analysis of both quantitative and/or qualitative data in a single study in which the data are collected concurrently or sequentially, are attributed priority, and incorporates data integration at one or more stage in the research process*”. Mixed methods research methodology, as per an article written by Courtney McKim (2017) can have additional value, as per studies that have shown it to increase, for instance, the validity of findings while assisting with knowledge creation resulting in a deeper and broader understanding of the issue and cultivates more ideas for future. McKim’s research (2017) also showed that graduate students who had conducted mixed-methods passages felt it more valuable for them than those that had conducted quantitative or qualitative passages alone. Students using mixed methods perceived it, for instance, more accurate than quantitative or qualitative methods alone. (McKim 2017, 203-213.)

4.1 Research model and data collection framework

The case study of this thesis is an exploratory study in nature since it aims to find answers to questions that require surveying the current situation and opinions by asking questions with the start of "what" while it also aims to gain insights into “how” the topic can be developed in the future. The exploratory study is also applicable to clarify the situation where the information is scarce and hence, the investigation is less rigorous (Quintão et al. 2020, 268). The exploratory study is especially applicable for case studies like this because it’s flexible and adaptive for environments like big companies where changes, for example, to research structure or direction might be needed in short term. (Saunders et al. 2015, 174-175.)

The research model of this thesis involves four phases of data collection and analysis representing the sequential mixed methods research. The first phase of data collection includes a collection of the secondary data which is later on used in the second phase of the data collection. The second phase of the data collection and analysis is based on primary data collected from the case company’s organization whereas the third phase of the data collection and analysis rests on primary data collection from external companies, independent from the organizational unit under the study. The final phase of the study relies on primary data collected through an expert interview. The findings and results from each data collection phase have an effect on the next phase and therefore each step needs to be conducted carefully. The mixed-method research model is presented in figure 11 below.

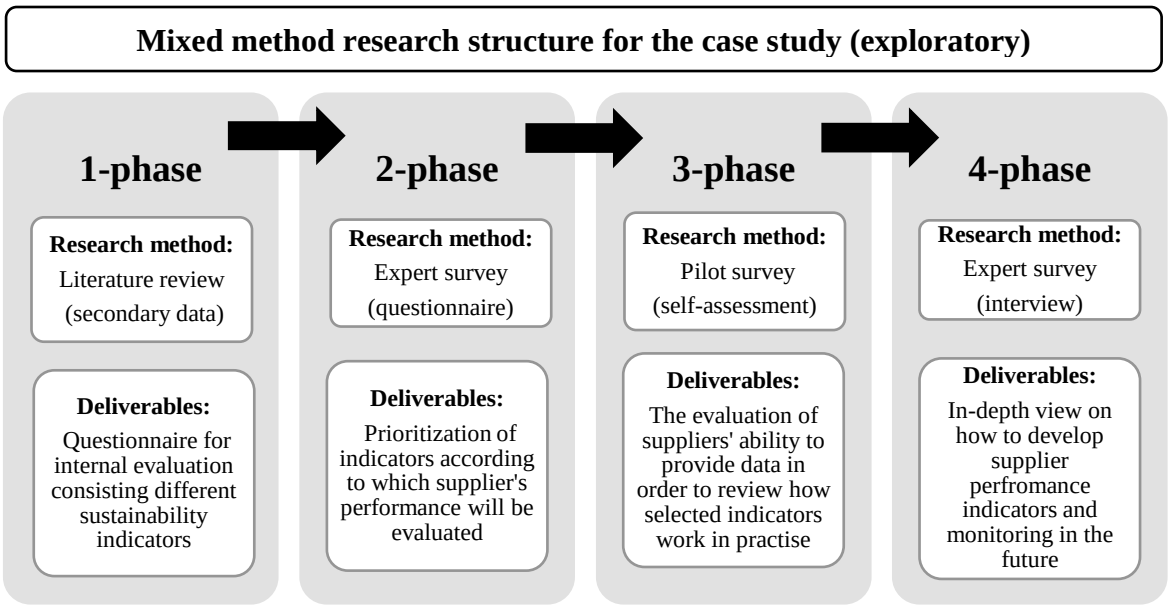

Figure 11. The mixed method research structure of the thesis.

4.1.1 First data collection and analysis phase

The aim of the first data collection and analysis phase was to search for relevant data for the internal questionnaire that was used later on in the second data collection and analysis phase. The secondary data in the first data collection phase included, for instance, academic surveys and text documents that were available online. Also, in some cases company's internal materials were being used.

Design for the internal questionnaire was started by first utilizing a study, conducted by Morgane et al. (2017), in which the authors had ranked the 36 most important sustainability aspects that can be used as a starting point for a supply chain-wide sustainability assessment in the electronic and automotive industry. In total, the study resulted in 115 sustainability aspects, based on research that involved studying the frequency of different aspects in electronic and automotive industry companies' reports and interviews as well as interviews conducted for companies and other stakeholders. Even though the study was conducted in the electronic and automotive industry, it can be considered that the industry is quite similar compared to the case company's industry, hence the study and its results was used to show the importance of different sustainability aspects within the industry.

Even if the wide set of sustainability aspects presented in the study by Morgane et al. (2017, 601), were used as a starting point for designing valid sustainability aspects for the case company's internal questionnaire, the more detailed questions related to each sustainability aspect were needed to be searched. According to Saunders et al. (2016, 452), when designing a questionnaire, it is possible to adopt or adapt questions from other questionnaires or develop one's own questions. However, while the former approach might be more effective than the latter one it requires careful evaluation of each question that is taken from an existing questionnaire since not all ready-made questions are good or help to answer the study objectives. Therefore, the ready-made questions need to be reviewed critically and modified if needed since the questions that are interpreted in the same way by the respondent and requestor are one of the key things in successful questionnaire data collection.

The first questionnaire version was created by considering the 40 most highly ranked sustainability aspects from the study by Morgane et al. (2020, 606) and the additional aspects which were included in 36 recommended aspects for companies to consider but weren't among the top 40 aspects in the overall ranking. After selecting the most suitable sustainability aspects which formed the basis for a questionnaire, the detailed questions were gathered from different sources including academic surveys, some of the case company's own pre-evaluation questions and audit material for suppliers, one consultant questionnaire and one other company's self-assessments that were available online (Ceres n.d; Frazer et al. 2020; Konecranes 2021e; Mesco Manufacturing n.d; Morgane et al. 2017). Hereby the questionnaire presented more variety of questions related to the same sustainability aspect. Furthermore, in order to underline the category-specific topics, a few themes and questions were added based on the thesis research findings on sustainability risk related to each category. That resulted in a draft questionnaire that included 117 questions in total.

The draft questionnaire was piloted with one of the case company's procurement managers to collect informal feedback from the internal question package. Based on the feedback received, the number of questions was too large to be distributed internally, thus an additional evaluation of questions was needed. The evaluation was completed by conducting a one-hour workshop in a presence of the case company's two managers, one from procurement and one from sustainability organization. The questions went being through

together and as a result, the evaluation was made by removing the questions that were too similar in nature or seen as not relevant to ask in internal evaluation. As a result, the final questionnaire included 63 questions that were seen as an appropriate handful of questions to be evaluated by internal experts.

4.1.2 Second data collection phase

The aim of the second data collection phase was to find the most relevant indicators that the case company sees preferably to follow up with the suppliers. As already presented in the previous chapter, the target was to find relevant indicators for each selected purchasing category alone which enables to focus on aspects that are especially important to acknowledge when evaluating certain suppliers. In order to conduct the research that would result in indicating the main indicators to evaluate, the internal questionnaire was formed by adding a 4-level Likert scale beside each question. The respondents were asked to evaluate the importance of each question to be asked from the supplier, in other words, "*how important it is to ask this question from our supplier*" either as 'not important', 'less important', 'important' or 'very important'. Also, it was possible to select an option 'do not apply' if a question was noticed not applicable to the purchasing category in question. In addition to the evaluation of questions, the respondents were given the possibility to write down free form modification suggestions or general comments concerning each question separately or the whole questionnaire overall.

The questionnaire followed a structured format and was made in an excel -format, which consisted of two sheets. The other sheet included instructions on how to respond to the questionnaire while the other sheet included the question package itself. The questions were grouped under the different sustainability dimensions, sustainability categories and sustainability aspects so that also respondents who weren't dealing with sustainability-related topics on daily basis could easily follow up on the different sustainability aspects and questions related to those. The questionnaire was handed over to the case company's global sustainability team and representatives from each three purchasing categories in procurement. It was agreed that due to the time limitations of each expert, every group (sustainability team and each purchasing category) would return one response file representing their common opinion. Moreover, it must be noted that the sustainability team

gave their response by evaluating the questions from every three selected purchasing category points of view whereas the single purchasing category representatives evaluated the questions only from their own category point of view. The overview of the respondents is presented in figure 12 below.

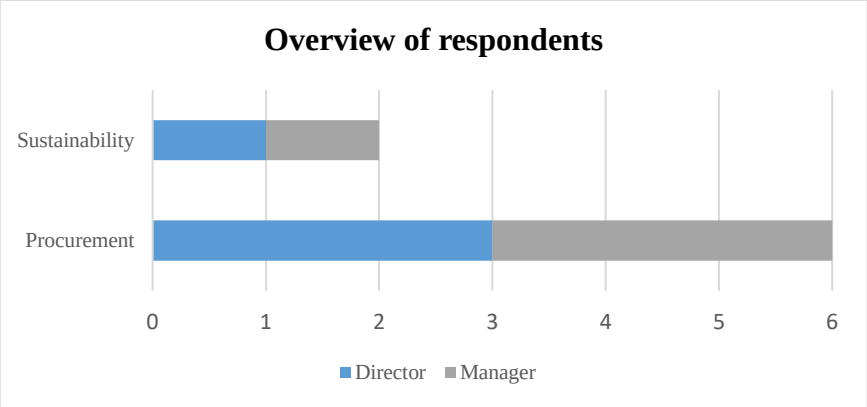

Figure 12. Overview of respondents who participated in the internal questionnaire.

After all the respondents had returned their evaluation, the ranking of aspects was made by weighting the importance of each question with a help of the average of answers. 'Not important' response was calculated with a value of 1, 'Less important' with a value of 2, 'Important' with a value of 3, 'Very important' with a value of 4 and 'Do not apply' with a value of 0. All the questions that received an average value below 3 were excluded from the final supplier questionnaire. Thus, the following main equation was applied:

$$\text{Average of reponse} = \frac{(r_1 + r_2 + r_3 \dots r_n)}{a}$$

Where:

r = single response

a = number of responses.

4.1.3 Third data collection phase

The aim of the third and external data collection process was to determine and investigate what is the current ability of suppliers to provide data to the Supplier Sustainability

Assessment, and on the other hand, interpret the suppliers' sustainability performance based on the selected indicators. When all the results from the second data collection phase were calculated in accordance with the above equation, all the questions which were being selected for the final assessment were transferred to the Microsoft Forms tool. Microsoft Forms tool was applied for the purpose of the third data collection since it is designed tool to provide easily accessible and usable questionnaires through web-link. The internal experts were also given an opportunity to verbally comment and give their proposals on the questions which were, obviously, considered in the final assessment design phase. Consequently, the question structures and response options were slightly changed as well as new additional questions were inserted to best match the views that experts had on how to get the most beneficial outcome.

After the modifications were made to the questions, the questions were grouped into four sections in the Microsoft Forms tool: Environment, Health & Safety, Social and Governance sections. The assessment included open-ended questions, closed questions with the possibility to choose only one option or closed questions with the possibility to choose multiple options. The assessment was designed in a way that only questions that belonged to the same section were visible at a time which was meant to help respondents to focus on the theme at hand. Once all assessments were ready, the assessments' usage was pilot tested with one of the case company's procurement managers who hadn't taken part in the internal expert evaluation. Also, final feedback regarding the assessments was gathered from the expert group before sending out the questionnaire. The pilot testing and final feedback phase were found to be very beneficial since they still resulted in valuable modifications to the questions and response options. Moreover, the new open comment possibility for suppliers was added to the end of each section for a purpose of open feedback and additional explanations.

The supplier assessment was distributed to external suppliers as a self-completed assessment using a Microsoft Forms link included in the email. The self-completed web questionnaire was chosen as a method to collect data from the external suppliers since the suppliers were located all over the world with moderately low daily connections for the case company. More importantly, the target of the case company with the thesis research was to receive a model

that they could use with low resources even for a big number of suppliers therefore, for example, semi-structured interviews were not appraised as a potential method for collecting supplier information in this research. However, since the self-completed assessment is known to have a lower response rate than for instance the interviews, more attention was paid to forming a clear and informative assessment as described in the last chapter.

The sampling technique for both the second and third data collection phase represented purposive sampling, also called judgemental sampling. According to Neuman (2005, 273-274), purposive sampling "uses the judgement of an expert in selecting cases and it's a valuable sampling type for special situations" such as the case study can be. The purposive sampling technique is also suitable when the researcher wants to select unique cases that are especially informative (Neuman 2005, 272). In the second data collection phase, the respondents of the questionnaire were selected based on their specifically highly knowledge and capability to evaluate such issues based on their expertise on sustainability topics or sustainability risks related to each chosen purchasing category for being piloted. Hence, those responses can be assumed to be especially informative even if the sample was very limited. On the other hand, the external partners from whom the data was collected in the third phase were determined based on the judgement of an expert in each purchasing category.

4.1.4 Fourth data collection phase

The fourth data collection phase was conducted by qualitative method, a semi-structured expert interview. The target of the fourth data collection phase was to get a more in-depth understanding of supplier sustainability performance evaluation and its possible further directions in the case organisation. According to Hyvärinen et al. (2017), the reason to interview the experts is, indeed, the knowledge that they are believed to have on certain studied phenomena or the process. The important thing in all interviews is to remember that interview will be based on the interaction between the interviewer and the interviewee and therefore, the interviewer needs to be able to interpret the situation and modify the position if required to get information relevant for the research. Hyvärinen et al. (2017.)

Saunders et al. (2016, 391-392) discuss in their book that when organizing a semi-structured interview, the researcher can have a list of themes with the possibility of adding some key questions that should go through in the interview. The semi-structured interview in an exploratory study can help to give important contextual information because it's not only asking for “what” and “why” but also put more emphasis on “why”. Therefore, the semi-structured interview can have an important value-adding place, especially in the case study research. In the case of the semi-structured interview, it is also enabled that the interviewee can explain and build responses differently than questionnaires or other quantitative methods provide the possibility for which gives also wider possibilities to the researcher to explore the phenomenon. (Saunders 2016, 391-392.)

The semi-structured expert interview was held with the one of case company’s directors. The decision to interview particularly this person and only one person was made since the procurement unit itself did not have a separate managerial person in charge of sustainability at the time. Instead, this director works regularly with procurement in terms of sustainability topics and has been one of the leading people to create the current procurement sustainability roadmap for the case company. Hence, it can be said that the interviewee has exceptional capability to both understand the case company’s global corporate sustainability strategy as well as the current procurement sustainability state and challenges. Being that said, this interviewee will be most likely to have also a very strategic view of where to guide the procurement's sustainable practices in the future, to best serve the achievement of the whole case company's sustainable targets.

4.2 Reliability and validity

As stated by Riege (2003, 81), the reliability of the study means that the way of conducting and processing the research can be repeated by another researcher who has the possibility to achieve similar results if the study is performed according to the same consistent research structure and methods. According to Golafshani's paper (2003), the reliability in qualitative research refers to the replicability and is supported by the stability of individuals’ scores if the questionnaire, for instance, is being re-tested. The validity, in turn, refers to the extent to

which the research measures the issues it was aiming to measure and how accurate and truthful the results are. (Golafshani 2003, 598-599.)

Practically, in the case study research, the first thing to keep in mind is the validity of construction. That means the data should be treated with quality and the process of the work should be clearly defined from the beginning to the conclusions, understandably to the readers. The reliability of the case study is highly dependent on the triangulation of data which refers to the process where the process is represented by several data collection instruments, evidence chaining and rigour. The validity in research is usually divided into internal and external validity. (Quintão et al. 2020, 269-270.) According to Quintão et al. (2020, 269-270), the internal validity ensures that the research results can be approved based on the research design while internal validity is not that significant for descriptive and exploratory studies. External validity then is fundamental to ensure that the phenomena investigated can be replicated in other environments. Practises to cherish the external validity are justifications for the case study selection, explaining the context of each case study and the identification of patterns that admit the later generalization of the research results. (Quintão et al. 2020, 269-270.)

The first data collection phase was based on secondary materials and hence, it is important to acknowledge the concerns related to reliability and validity. Survey data can be considered to be reliable and trustworthy as the reputation of the researchers and research organisations is highly dependent on the credibility of the data they provide. With the internet documents that were used in the first data collection phase, the issue is more complex. The first thing to do with the internet documents is to come across the person or organization who is responsible for the data and take a look at any additional data, such as copyright statements, and then assess the reliability of the source. That technique was applied in the first data collection phase which contained both survey data as well as internet documents created by for instance other companies that were considered reliable. (Saunders et al. 2016, 338-339.)

The validity and reliability of this thesis research were particularly enhanced by taking the time to the creation of data collection questionnaires. Even if the data collection sample was highly limited, and it must be said that purposive sampling can’t be used in any kind of

generalization, like it wasn't aimed in this study, Saunders et al. (2015, 449) states that "the validity and reliability of the data you collect and the response rate you achieve depend, to a large extent, on the design of your questions, the structure of your questionnaire and the rigour of your pilot testing". Therefore, the questionnaires were pilot tested before every data collection phase to minimize the impacts on research validity or reliability. The content of the questionnaires and the use of questionnaires were also documented to ensure those can be replicated if needed. However, the result obtained from the questionnaires is likely to be different if the study is being replicated since the result are always affected by the level of awareness of respondents as well as the sample size and the response rate.

In the case study research, the reliability and validity are more dilemmatic issues than other types of research strategies since the case study context is always unique. The methodology may have been even restricted to the research of the single case unit, and thus it is usually impossible to replicate the case study within the same conditions in which it took place. Still, it is critical to consider the reliability and validity also in the case study research and aim to describe the study structure, data formation, data collection and most important pillars to enable replicability of the study if needed.

5 RESULTS AND ANALYSIS

In this chapter, the results from the case study part will be presented shortly. The results include the summary of responses resulting from the second data collection phase from the case company's experts, the third data collection phase resulting from the suppliers and the fourth data collection phase from the expert interview.

5.1 Priority indicators to be collected from the suppliers

The first data collection phase resulted in the internal questionnaire that included 63 sustainability-related questions. The experts were asked to evaluate the importance of each question using a 4-step Likert scale from 'not important to 'very important'. The results were calculated as an average by 'not important' indicating value 1, 'less important' indicating value 2, 'important' indicating value 3 and 'very important' indicating value 4. In the questionnaire, questions were grouped into different sustainability dimensions, sustainability categories, and sustainability aspects. With a help of a grouping of questions, results can be also viewed from the point of looking at whether some sustainability categories were especially highlighted among the case company's experts. Nevertheless, it has to be noted that due to a different number of questions under each sustainability category, the average result will give just a rough signal of perceived trends. In Figures 13 and 14, there is presented the average priority weighting of questions that were presented under each different sustainability category.

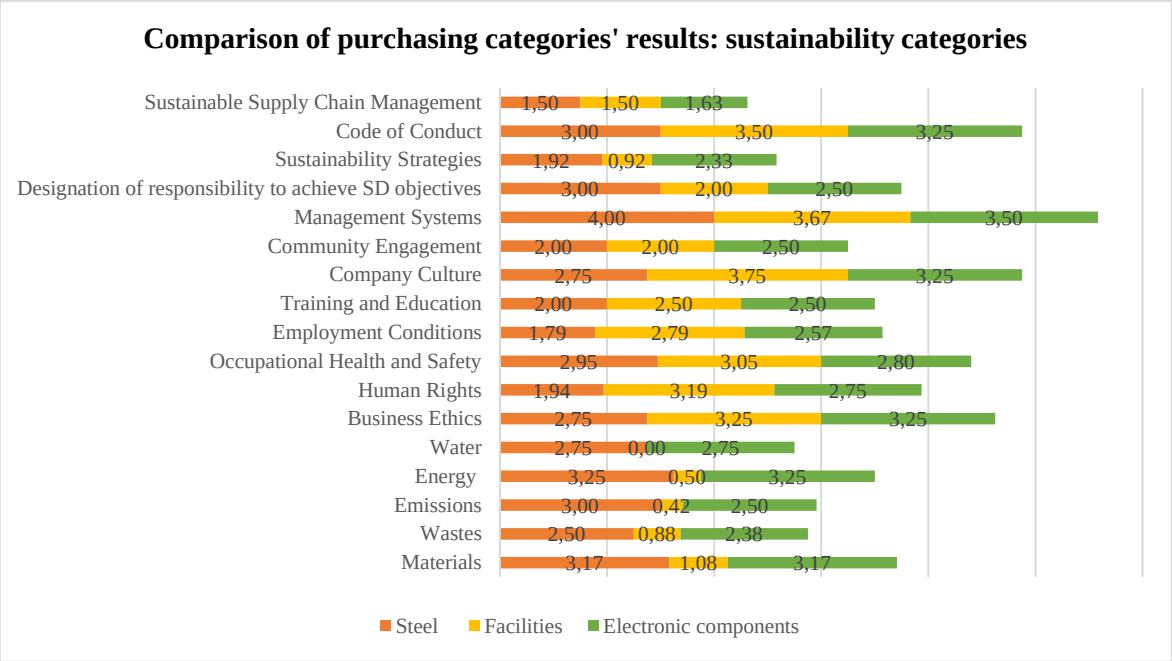

Figure 13. Comparison of purchasing categories' results presented per sustainability category.

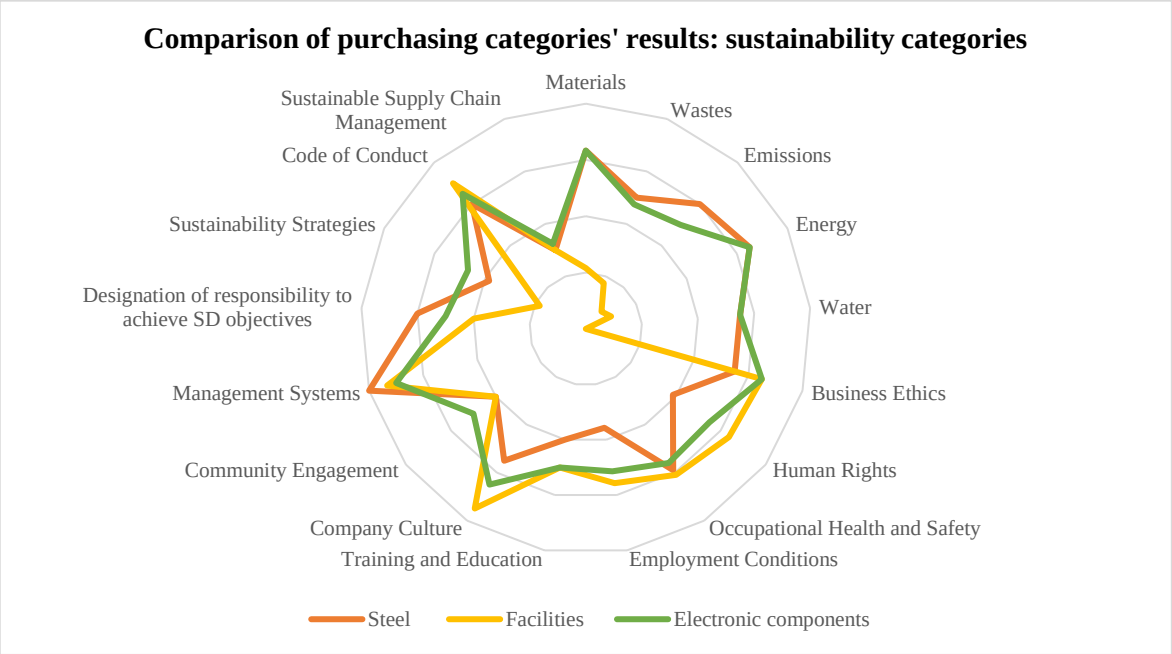

Figure 14. Comparison of purchasing categories' results presented per sustainability category.

From the results, it can be seen that different sustainability categories were prioritized quite similarly among the three different purchasing categories except for the environmental related aspects that were mainly ignored from the facilities' category point of looking. However, that is not exceptional because suppliers belonging to the facilities category work

usually in the facilities of their customers, thus it is usually the responsibility of the facility owner to take care of the environmental issues of the facility. The one to be pointed out is the result of the management systems that received almost the highest prioritization in all categories. Also, the code of conduct topic was considered the top priority to be asked from the suppliers.

On the other hand, the sustainable supply chain management and sustainability strategies categories resulted in the lowest result in prioritization. The low result of the sustainable supply chain category can be explained by the case company's current focus on Tier 1 suppliers and hence, it might be that the experts do not consider it's yet relevant to focus on the management of Tier 2 suppliers. Regarding the sustainability strategies category there were questions related to two sustainability aspects: learning and awareness-raising for employees within the organization (about the sustainability strategy) and life cycle approach (consideration of whole product life cycle in decisions). These topics are quite advantageous in nature even amongst the more sustainable mature companies and thus can be still seen as not a priority to ask from the suppliers at this point.

Overall, the results emphasize as well as also support the previous findings discussed in chapter three, of sustainability risks related to each purchasing category. To exemplify, the steel and electronic components are quite similar purchasing categories in nature since both categories' suppliers provide the manufactured goods for the case company. Still, as stated in the past chapter focusing on sustainability risks in each purchasing category, for example, the human rights and employment conditions have been highlighted in the electronic industry in recent years due to the emerging need for rare raw materials, especially conflict minerals, that are mined in the areas of high risk for human right violations. Steel, in turn, is known to be a very challenging material in terms of its high emission and hence, the emission-related topics were prioritized more compared to the electric components' category.

Based on the prioritization of questions, the supplier sustainability assessments were formed for each purchasing category. The final number of questions under each section is presented in figure 15 below. The final assessments can be seen in appendices II, III and IV. It must

be noted that the assessments were slightly different due to the idea to find relevant indicators that would best indicate the need of all categories alone. However, there were also similar questions that were included in all three assessments despite the different industries they operate in. Those equally high-rated questions are presented in table 5 below.

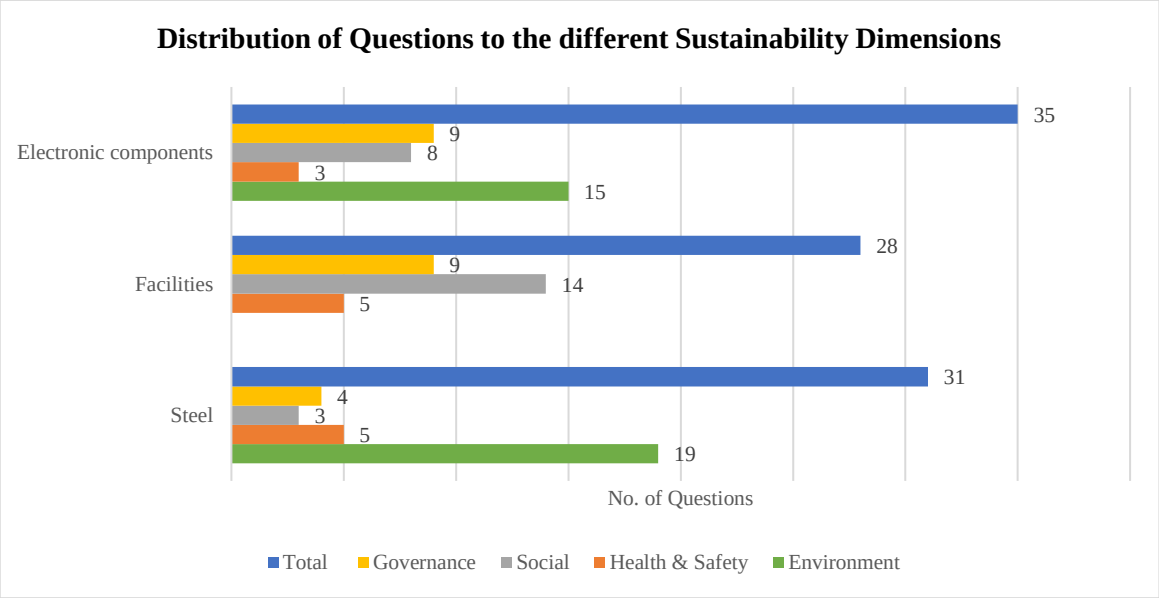

Figure 15. Number of questions included in each section in all of three, category specific supplier sustainability assessment.

Table 5. Questions included in all three, category specific supplier sustainability assessments.

Sustainability category	**Sustainability aspect**	**Supplier Sustainability Assessment Question**
Business Ethics	Corruption and bribery	Does your company have an Anti-Corruption / Bribery policy?
Occupational Health & Safety	OH&S Trainings	Which of the following occupational health and safety matters are your employees trained for? • Safety equipment • First aid training • Chemical management • Machinery safety • Maintenance • None of the above • Other
Occupational Health & Safety	Emergency preparedness and response	Has your company conducted an occupational health & safety risk assessment? • Yes, by internal and external expertise • Yes, by internal expertise • Yes, by external expertise • No, risk assessment has not been conducted

Occupational Health & Safety	Preventive and corrective actions	For which of the following management systems has your company conducted audits on in the past three years? • Environmental Management System • Labor Management System • Health & Safety Management System • Quality Management System • None of the above
Occupational Health & Safety	Preventive and corrective actions	Are corrective actions identified by the environmental, labor, health, and safety audits tracked to closure? • Yes, all corrective actions are tracked to closure • Not fully, only specific corrective actions are tracked to closure • No, corrective actions are not tracked to closure • Not applicable
Company culture	Employee interviews /communication	Does your company's facility/facilities have effective grievance procedures in place to allow employees to bring environmental and/or work-related violations and/or concerns to management's attention in an anonymous manner without fear of retribution?
Management Systems	Environmental management system, Quality Management Systems, Health & Safety Management System	Which of the following certified management systems does your company have in place? • Environmental Management System (ISO 14001) • Quality Management System (ISO 9001) • Health & Safety Management System (ISO 45001) • None of the above • Other
Code of Conduct	Ethics code of conduct	Is your company able to meet requirements defined in Konecranes Supplier Code of Conduct?

It is needed to point out that some of these above high-rated questions mentioned in table 5 are already being asked in the case company's supplier onboarding phase and relate highly to the requirements that the company states in its Supplier Code of Conduct and to which, the company expect its suppliers to be committed. Nevertheless, sustainability-related information gathered during the onboarding phase is not stored in a single, combined database which would enable easier use of that information later on, for instance, in the supplier performance evaluation process. It is also good to retest whether suppliers truly acknowledge and implement the requirements of the Supplier Code of Conduct. Therefore, these questions can be seen as both especially important to the case company as well as valid to be present also in the supplier's continuous evaluation process.

In addition to the most similarly high-ranked questions, particularly two questions were brought up in the internal evaluation for steel and electric categories by the verbal comments. The comments indicate that according to the case company's global sustainability team, the

below questions are going to be very important in the case company's supplier performance evaluation in the coming years. The questions and comments are stated in table 6 below.

Table 6. Questions that were considered as particularly important in internal evaluation based on written comments.

Question	Comment from evaluation
If known, what is the share of recycled material in your production? Please inform the percentage of recycled material.	"This information we should start collecting" - Respondent
Does your company have set publicly available targets to reduce GHG emissions?	"This is a must ask since our company is committed to SBT (Science Based Targets initiative)" - Respondent

If the results are viewed per each purchasing category table 7 below shows the most highly ranked questions (average results 3,5-4,0) per each purchasing category and how they could be formed as indicators. The table shows the steel category as "S", the facilities category as "FA" and the Electronic components category as "EC". Many of the below-presented indicators and measurements, of course, can be applied in practice to many categories which would, on the other hand, enable creating "one size fits for all" type of assessment if it is possible to select 'do not apply' option.

Table 7. Highest rated topics of each category defined as sustainability indicators.

Indicator	Definition	Measuring Scale	S	FA	EC
Safety Data Sheets	Maintenance of up-to-date material safety data sheets (MSDS) for all hazardous substances	Yes / No			✓
Konecranes Restricted Substances	Proper management of Konecranes Restricted Substance List	Yes / No			✓
Circular Materials	Use percentage of circular material in the offering	%	✓		✓
Increase usage of Circular Materials	Target to increase the use of circular material in the offering	Yes / No	✓		
Waste disposal	Proper management and disposal of different waste types	Yes / No	✓		✓
CO_2 emissions	Amount of CO_2 emissions in a year including Scope 1 and Scope 2	tCO_2e	✓		✓
CO_2 reduction	Publicly available target of decreasing CO_2 emissions	Yes / No	✓		✓
SBT Commitment	Commitment to Science Based Targets Initiative	Yes / No	✓		
Energy Efficiency (own products)	Target to increase energy efficiency of own offering	Yes / No	✓		✓

Energy Efficiency (own operations)	Target to increase to energy efficiency of own operations	Yes / No	✓		✓
Renewable Energy usage	Target to increase the use of renewable energy in own operations	Yes / No	✓		✓
Anti-Corruption / Bribery Policy	Existing written policy concerning Anti-Corruption	Yes / No		✓	✓
Child Labour	Evidence of Child Labour in past three years	Yes / No		✓	
Young Workers	Possible exposure of young workers to night or hazardous jobs, and OH&S risks	Yes / No		✓	
Discrimination	Existing written policy for, hiring, salary, benefits, termination, and retirement	Yes / No		✓	
OH&S Training	Employee training of determined occupational health & safety topics	None / Some / Comprehensive	✓	✓	
Risk Assessment	Conducting Health & Safety risk assessment	Poor / Sufficient / Excellent	✓	✓	
Management System Auditing	Audits conducted for Environmental, Social, Quality and H&S Management Systems in past three years	None / Some / Comprehensive		✓	
Corrective Actions Closure	Completion of corrective actions resulted from audits	Poor / Sufficient / Excellent		✓	
Valid use of contracts	All employees provided with a contract in a language they understand	Yes / No		✓	
Wage payment	The level of wage which all employees are paid	Poor / Sufficient / Excellent		✓	
Working hours and compensation	Policies to ensure legal working hours and provision of compensation	None / Some / Comprehensive		✓	
Whistle blowing channel	Existence of whistle blowing channel	Yes / No		✓	✓
Prevention of harassment at work	Existing written policies to ensure the workplace is free of harassment	Yes / No		✓	
Management Systems	Existence of Environmental, Quality and H&S management systems	None / Some / Comprehensive	✓	✓	✓
Design for Environment (DfE)	Company consider DfE in its design of products and processes	Yes / No	✓		
Konecranes Supplier Code of Conduct	Commitment of Konecranes Supplier Code of Conduct	Yes / No	✓	✓	✓

5.2 Supplier sustainability assessment pilot

The supplier sustainability assessments were piloted with selected suppliers from the steel and facilities category after the list of priority indicators was formed. The idea of the supplier sustainability self-assessment pilot was to get an understanding of whether suppliers can provide such sustainability data which was determined in the second data collection phase. In addition, it was considered an interesting finding to see what is the sustainability performance of those suppliers that contributed to the assessment based on selected indicators. It must be stressed that the sampling of suppliers was not mentioned to represent

any larger supplier group thus, no broader conclusions can be drawn from the results, for example, on the sustainability performance of some categories of suppliers in general.

The assessment was sent to nine suppliers in the steel category and five suppliers from the facilities category. The timeline to collect the responses was two weeks including one reminder. From figure 16 below it can be seen that not all the suppliers responded to the assessment. The reasons can be many: supplier sustainability assessment was voluntary, and, on the other hand, the responsiveness of the supplier can be dependent on how important the customer the case company is from the supplier's point of view. Also, the time frame related to the overall market situation and its challenges can be assumed to be affected. In other words, if the supplier considers the case company to be an important customer for its company, it is likely that they wish to support the case company and provide information that is requested from them.

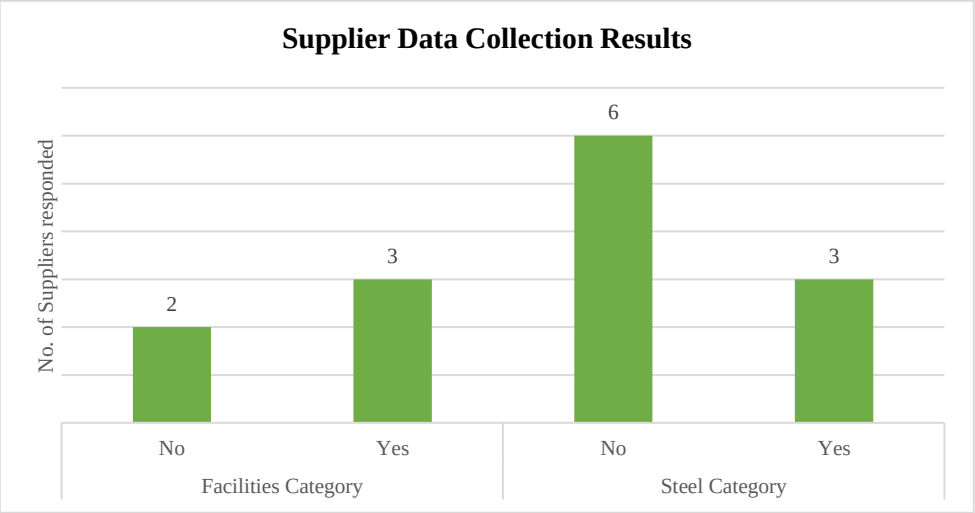

Figure 16. Response results from Supplier Data Collection Pilot.

From those suppliers who responded to the assessment, the results gave a positive signal that the designed assessment was understandable and can provide wanted answers in relation to how suppliers perform in sustainability areas. On the other hand, it also showed that responses can be somewhat fragmented. For example, the questions presented in table 7 below show that not all suppliers, even if the sample is very limited, can't provide that accurate data yet. Also, the questions that were noted as "must ask" indicators in table 6 had variations among responded suppliers. Table 8 presents a few assessment questions to

exemplify how the responses were divided between the suppliers. It is not possible to draw broader conclusions from the results due to the limited sample, but at least the responses gave a hint that some of the case company's suppliers are well advanced when it comes to emission data for example, while others do not yet have similar information to share.

Table 8. Example of supplier responses to Steel category assessment.

Assessment Question (Steel Category)	**Supplier 1**	**Supplier 2**	**Supplier 3**
What is the rate [%] of Circular Materials used in your company's offering?	Srcap is being used, but [%] rate **not known.**	94%	Approximately 80%
Does your company have a target and programme to increase the use of Circular Materials and to reduce the use of virgin materials in your company's offering? If yes, please inform a target and its time frame.	Questions is being discussed. Main target is to be carbon neutral by 2030.	Yes, target 95%	**Probably not.**
What is your company's total amount of Greenhouse Gas (GHG) emissions including Scope 1 and Scope 2 in the most recent year measured? Please enter in total metric tons carbon dioxide equivalent [CO_2e] in a year. Please inform also the year when emissions were measured.	997 t [CO_2e]	190 t [CO_2e]	**Not known.**
Does your company have set publicly available targets to reduce GHG emissions?	Yes	Yes	**No**
Does your company define and monitor Greenhouse Gas (GHG) emissions per product type?	Yes, for some product types	Yes, for all product types	**No**

In the facilities category, the most questions were related to social sustainability. The questions were mainly quantitative and based on "yes" or "no" choices. The responses received were quite aligned and showed good performance within each asked sustainability area. Thus, if the company wishes to measure, especially social topics, with this kind of self-assessment, it must be thought about how to measure especially the development of suppliers when there are no similar quantitative metrics to the environmental area for example. Still, the questions do measure whether all relevant procedures in terms of social sustainability are in place and hence, can reveal those suppliers that do not have, for instance, relevant

certificates in place or do not organize appropriate training for their employees. As an example, possibly in the future, the assessment made for a wider count of suppliers could give a result percentage of how many suppliers in the facilities category have environmental or health and safety management systems up to date. This kind of information could benefit the case company from two aspects; to measure its own target to move on to buying from more sustainable suppliers and to measure how its suppliers are performing in relation to each other.

Even if the responses were mainly aligned between the suppliers who replied in the facilities category, there was one question related to social sustainability which pointed out that not every company has all the policies perfectly handled. That speaks to the importance to ask also questions related to social sustainability as well and it also indicates that with the wider set of suppliers, the responses could be even more fragmented regarding, for instance, the topic as presented in table 9 below.

Table 9. Example of supplier responses to facilities category assessment.

Assessment Question (Facilities)	**Supplier 1**	**Supplier 2**	**Supplier 3**
Are all workers provided a written employment agreement in a language that they understand?	Yes	Yes	**No**

As already stated above, the supplier sample in the supplier data collection pilot was very limited and therefore, the results won't provide answers to wider phenomena such as "how suppliers overall in the Steel category perform in terms of sustainability and what is overall suppliers' capability to provide sustainability data?". However, the results do indicate that with the designed assessment, suppliers are able to provide sustainability data for the case company and among the responded suppliers the sustainability performance is overall good level based on the researcher's response observations.

5.3 Expert interview results

The last data collection phase was conducted by interviewing one of the case company's directors. The semi-structured interview was held online via the Microsoft Teams application, and it lasted 46 minutes. The interview questions were formed based on the main

research questions of the thesis while leaving enough space for free discussion. Hence, finally, there were four themes representing the research questions and underneath every theme, there were two questions aiming to get deeper knowledge on the issue. Even though the interview contained all four research questions, the semi-structured interview was arranged with the purpose to provide answers particularly for the last research question considering the future implementation suggestion. The research questions are presented in appendix II.

For the first research question, the interviewee pointed out that, the target is that the procurement should be capable of evaluating its suppliers based on their sustainable performance already today and according to the interviewee, the effective supplier sustainability evaluation shall be started from the supplier onboarding phase. The interviewee stated that procurement does have very well working practices like Audits and Supplier Code of Conduct signings but taking into account that the global corporate sustainability strategy is at a very mature level today, the procurement might not be yet ready to safeguard and execute the whole corporate strategy which itself is very ambitious. As a result, the interviewee's opinion on whether current procurement practices drive the corporate strategy forward was not straight positive since the procurement still has space to improve the capability of making decisions based on, for instance, the supplier's sustainability performance.

As an example, according to the interviewee, as the case company has committed to Science Based Targets Initiative, meaning that the company has committed to reduce their emissions in line with the Paris Agreement Goals (Science Based Targets n.d.) the case company has already identified the steel category as one of the critical purchasing categories and therefore, the company has started building systematic evaluation process for the steel suppliers.

> *"If we want to buy from the sustainable suppliers and buy the products that are more sustainable than the others, for example, using carbon intensity as one criterion we should have a process that supports fulfilling these principles. This means that we would already from the beginning have the competence to identify whether the suppliers are acting sustainable or can*

> *provide more sustainable material to our company before our company onboards the suppliers." - Interviewee*

Considering the second research question, the interviewee said that if the KPIs are thought from the group sustainability perspective, different type of emission calculation is very critical now. However, the interviewee continued by stating that before the KPIs are defined, it is crucial to clarify clearly where the company aims with the sustainable supplier evaluation and how it is expected to help or guide the decision-making process. When it comes to industry-based thinking, the interviewee responded that it sounds wise and effective to have industry or purchasing category based KPIs since it's not benefitting anyone, the buyer company or the supplier, to ask irrelevant topics but rather focus on the ones which are most important in each industry.

For the third research question, the interviewee stated that the question would be more relevant to ask from the suppliers but, if the similar questionnaires are considered from the case company's point of looking, they usually require a lot of time which would advocate that if the questionnaire would be a part of some mandatory business process it would easiest the supplier work as well. Nevertheless, the interviewee also stated that in many cases these kinds of questionnaires require a sustainability person to be responding to the questions and thus, it might not be possible for a selling person, for example, to have the ability to respond to all of the questions during one meeting. The other thing brought up was also the existing IT processes of the company.

> *" Also, usefulness of this kind of weblink questionnaire is dependent on the other IT systems of the company, since the situation where we would have data separated and fragmented here and there is not desired. Rather the data should be integrated."- Interviewee*

As a response to the second sub-question, the interviewee had a clear opinion that not the same topics should be required to disclose from, for instance consulting service supplier, working on the same business volume as the steel supplier since it is not relevant to ask same climate issues, for example, from the consulting service supplier than the steel supplier.

The fourth, and final research questions considered the further development actions. Related to the sustainability self-assessment as a tool, the interviewee suggested that the group of suppliers receiving the assessment could be a combination of both the strategic ones as well as high-risk ones not forgetting the suppliers that could be assessed based on other high priority reasons resulting from some strategic decision. The interviewee also commented on the frequency of the assessment as below.

> *" Another question is that is it needed to conduct the assessment annually. It considers wide topics which might take time and therefore, the change might not be visible in a year. On the other hand, the world is changing at a so shocking rapid pace that considering that, it might even advocate sending assessments to suppliers annually."- Interviewee*

In the asked scenario of using an assessment possibly already in the supplier onboarding phase, the interviewee agreed and said it would make sense. However, it was also noted by the interviewee that defining of the most relevant sustainability indicators to any kind of process, or document, requires a deep understanding of why some topic is relevant for some category. By saying that, the interviewee highlighted the importance to develop every sustainable process together with the purchasing category representatives as well to understand the reality of the counterparty meaning the case company's suppliers.

> *" For instance, at that point, when we want to increase our ambition to include other procurement categories in SBT Scope 3, we should have active cooperation with our suppliers and for example, require that all of them are having activity related to climate targets. And by saying that, it could be thought should we already start expanding the scope by asking suppliers about the climate targets, as one target example to be applied to all, and then review the progress of our supplier base over the years?" – Interviewee*

As a last request, the interviewee was asked to give a view on the next development steps and the interviewee responded as follows:

> *" We should ensure that we acknowledge the suppliers and requirements that they would be subject to and through which we can evaluate them. We can't make a sustainable decision without the proper process from the very beginning."- Interviewee*

Additionally, the interviewee told an example, where the case company was asked to fulfil certain requirements as a supplier. However, requirements weren't limited to having a certain certificate but also accepted a certain result obtained from widely used third-party sustainability assessment. The interviewee described that it was a good example to see that the customer company had thought also alternative ways for the requirements through the reality in relation to what to require from the suppliers.

6 DISCUSSION

In this chapter, the thesis findings are discussed and interpreted. Also, the limitations of the study as well as future recommendations for academic research are presented.

6.1 Findings from the study results

The current practices on how the case company evaluates its suppliers, presented in chapter 3, showed that the case company have already some well-working supplier sustainability evaluation elements both in the supplier onboarding process as well as supplier relationship management process. However, and even though the focus of this thesis was more on determining supplier relationship management phase indicators, it must be acknowledged that, based on the theoretical framework and expert interview, also some attention should be directed to supplier onboarding phase evaluation. As an example, it was pointed out in the interview that currently, the case company do not store the sustainability information required from the onboarding phase in a way that it would be easily available for future supplier evaluation purposes, except for the Supplier Code of Conduct compliance. That is something that the case company should consider developing as, nowadays, taking into account all the digital possibilities, it might not be reasonable to collect information that is not used effectively later on. Furthermore, this would also enhance the transparency of the management of the case company's compliance topics.

To mention some good elements that the case company's procurement has evaluate its suppliers' sustainability performance are, for example, audits and, especially Supplier Code of Conduct audits, that were conducted by a third-party auditor. In addition to that, the company have a comprehensive Supplier Code of Conduct renewed in 2018, which sets baseline requirements related to all the most important sustainability topics that the case company's suppliers to comply with. Even having the good elements, in the expert interview, the interviewee stated that as affairs stand, the procurement's supplier sustainability evaluation practices won't yet drive the global corporate strategy forward with all the potential it would have. One barrier is that because the case company's corporate sustainability strategy is already so mature and the company has committed to very

ambitious targets, the current practices, and processes despite how well-working, are not yet enough to achieve the goals that require also strong involvement of the supply chain and suppliers.

Hence, the first step to develop the current practices would be already in the onboarding phase while the expert interviewee also highlighted the importance of having more demanding requirements for certain suppliers and supplier categories such as steel which would enable the company truly to select to source from the most sustainable suppliers. That said, it was also brought up that there is still space to increase the sustainability ambitious level in the whole organizational thinking. That is possibly the challenge of many organizations on how to shift the decision-making process from an inside-out approach to outside-in approach making a truly positive impact on the environment and society, as presented in the framework of Dyllick and Muff in table 1 (201, 13). What might support and motivate the change is that it would be acknowledged that those organizations that are prepared and shifted creating more sustainable and resilient supply chains are also more likely to survive during challenging times with less damage and operational effects via a help of trusted partners and via more stable materials.

One finding from the literature review that what was missing from the case company's supplier sustainability evaluation processes was a visible supplier sustainability risk management process. For instance, as presented in the benchmarking process, Valmet Oyj, another Finnish multinational corporation, has established a supplier sustainability management process that required all the suppliers to be committed to Valmet's Sustainable Supply Chain Policy followed by the Valmet's sustainable risk assessment process. (Valmet N.d.) Having a Supplier Code of Conduct and other background checks and due diligence documents in place, for sure, can be considered as a key elements of risk management. Though, it would be more recommendable to the case company to disclose how the company utilizes the information collected in the onboarding process and relationship management process in relation to supplier sustainability risk management as there was only a limited number of Supplier Code of Conduct Audits.

In chapter three, based on the reviewed study context, the study ended up with the view that the case company's sustainability strategy and study context would position around the business sustainability 2.0 in the Dyllick and Muff (2016,13) framework, even though, it must be noted that values for which the sustainability strategy is based on, are already beyond the triple bottom line. However, this study argues that from the results point of view, even though the indicators to be evaluated from the suppliers represent a moderate ambition level, if the case company's supplier selection or purchasing volume will be affected by the sustainability aspects, the case company's business concerns (what?) and values (what for?) will be seen to move towards the true business sustainability. That is justified by the statement that by taking into account the sustainability aspects in its supplier decision-making processes, the case organization just not reactively minimize the risks but also pursues to proactively choose the more sustainable suppliers which again has a cascading effect on the industry, since the suppliers, who, for example, have also own climate targets will be selected more often than the ones which do not have.

6.2 Study implications against the current literature

This case study contributes to other existing research by strengthening an understanding of what possible key indicators could be used in the supplier's sustainability evaluation. While previous research has mainly concentrated on the key sustainability areas or themes, which are most often top-ranked in literature or global sustainability rankings or reporting frameworks, this study aimed to attempt to prioritize the most important themes within a single organization and then, transfer those into the practical level in a form of key questions and indicators. These study results built existing evidence that the academic literature needs more research on possible sustainability indicators through which to assess suppliers of organizations. Especially social sustainability issues are challenging to measure since the measurement cannot return necessarily a numerical value. However, this study highlights that there are also industries in which the social issues play a great role and where the social sustainability dimension should be able to measure. Another aspect that this study argues is the lack of research on, specifically, indicators directed to evaluate suppliers, while current studies related to sustainability indicators focus mainly on the measurement of companies' own operation and hence, cannot be always generalized to the supply chain.

6.3 Limitations of the study and future research recommendations

The study limitations of this thesis are very much related to the research setting meaning research methodologies and sample size used in this explorative case study research. First of all, the thesis was conducted as an assignment for a single case organization and hence, the study was made through the lenses and benefit of this particular organization and thus, with limited sample size. Therefore, the results cannot be straightly generalized to the wider group of organizations. In addition, the empirical study part, especially the second data collection phase, relied very much on the knowledge of experts in the case company while their knowledge of sustainability issues and overall organization's sustainability strategy can change and grew over time. Hence, the study results gotten from this study are greatly related to the time when the study was conducted, while there are no straightforward limitations why the research structure itself could not be used in the future as well, however, recommendable with the larger sample size.

Speaking of the sample size, the study's reliability and validity can be also questioned due to the very objective interpretation of the fourth research question. Utilizing only one interviewee in the semi-structured interview is rather an untypical choice but is justified by the interviewee's pre-knowledge about the study context under the research and the interviewee's stage of professionality. Though it must be noted that the chosen study methodology in the second data collection phase could have included also semi-structured interviews where the interviewees could have pointed out how they see that chosen indicators enhance the strategic targets that the case organizations have in terms of sustainability. That might have been beneficial to both, the study result, and the experts themselves since they should have had to think of more causal connections in relation to each indicator. Moreover, now the indicators were determined for the experts in the evaluation part beforehand whereas it could have been more likely to receive more new ideas of possible fitting sustainability indicators during the more loosely structured interview conversations. However, that would have taken more time and many more sessions which were unlike to be possible within the relatively short timeline of the study.

The other limiting factor of the study was the amount of transparent data on supplier sustainability indicators in research or what other similar organizations or companies are using. That can be a consequence of the fact that supplier sustainability evaluation, is still a relatively new topic for many organizations while many other more sustainability mature organizations have started to use commercial tools for evaluating their suppliers. Therefore, as it was found already in the literature review, there is a clear need, stated in other studies as well, to have more research on sustainable supply management and its practical implementations in businesses. In the future research, it shall be to also integrate the supplier's feedback from the received assessments and how complicated, heavy et cetera they see evaluation practices today. Because in today's world, the request for different information in buyer-supplier relationships is probably higher than ever before, it is even more important to also understand what the perceived benefits of data are, and when the data collection will be more harmful than benefitting.

7 RECOMMENDATIONS

The main target of the case company with this thesis was to have new sustainability related KPIs embedded in the supplier classification in addition to one existing one which is the Supplier Code of Conduct compliance of the suppliers. Briefly explained, the supplier classification is a case company's process where the suppliers are classified based on defined attributes such as KPIs which provides clarity to supplier portfolio management (Konecranes 2022). However, when speaking of KPIs, Parmenter (2007, 6) states that the KPIs should be monitored either 24/7, daily or weekly while monthly, quarterly, or annual measurements cannot be considered as KPIs since the nature of KPIs is current-, and future-oriented. Therefore, depending on the frequency of supplier sustainability classification measurements, the indicators should be defined as KPIs with precaution in a research framework like this. An indicator can be, in turn, defined loosely which is why it is more usable in this context.

Sustainability, even if only considering the environmental and social issues, is a very wide topic and thus, the thesis resulted in an assessment that included 28-35 indicators depending on each purchasing category in question. That number of questions and indicators, however, is not possible or even reasonable to be included in the supplier classification that involves many other aspects, for example, related to quality and economic issues, through which the case company evaluates its suppliers. On top of that, as it was found out in the expert interview, the indicators that would be embedded in supplier classification require a deep understanding of the issue measured. That statement is also supported by Franceschini et al. (2019) who define that measuring is an essential for the process-performance control and improvement but constructing and implementing a measurement system is easier said than done and requires careful identification of "right" indicators. Moreover, the indicator usually refers to a specific target which can be considered a reference for comparison. (Franceschini et al. 2019, 7.)

It is also one option, as suggested during the expert interview, to think about whether it is more meaningful instead of having single indicators gather and calculate some, perhaps percentual result from many sustainability-related questions. As agreed also by the

interviewee, the result assessments of this thesis can be used to some extent when selecting the “right” indicators for supplier classification, but still, when defining indicators for the strategic measurement system, the foundation should be the strategic plan, as discussed also by Franceschini et al. (2019, 136). The crucial thing at the practical level is to know what the strategic goal is and why indicators are being measured. After defining the strategic plan, it can be useful to think responses to the below questions to be able to determine which indicators can be chosen to be measured and as another important aspect, who are the owner(s) and customer(s) of the data (Franceschini et al. (2019, 137):

- What information is being reported?
- Who is responsible for collecting and reporting data on the process performance?
- When and how often are performance indicators reported?
- How is the information reported?
- To whom is the performance indicator reported?

Also, it is good to remember that this thesis determined the sustainability indicators by taking into consideration the purchasing category aspect. When asking the interviewees opinion on whether it would be meaningful to determine or weight sustainability indicators differently to classification based on the purchasing category, the interviewee thought it would be more efficient. However, the interviewee also stated that it may depend on how the supplier classification affects the decision-making processes, and hence this study found it is needed to have a more detailed discussion on the practical implementation of the sustainability indicators to supplier classification, particularly, considering this concern.

As a result of all the issues mentioned above, the thesis will give three proposals of different options on how the determined sustainability indicators could be utilized in the future to best serve the case company’s further implementation.

7.1 Proposal 1: Calculating the result percentage of assessment responses

The first proposal is to use created supplier sustainability assessment either based on the category specified indicators or then modify the assessment to be as “one size” for all. That

would mean that the same assessment could apply to all suppliers while facility suppliers, for example, would have a possibility to select 'not applicable' choice in the case of irrelevant questions. In this proposal, the evaluation is conducted for all three pilot assessments and evaluation proposals being illustrated in appendices III, IV and V.

The supplier sustainability assessment result would be built based on the simple calculation method of different measuring scales. In the first case, the 'yes' response would present the value 1 while the 'no' value 0. In the second case, where there are multiple options to select from, the 'None' means none of the options has been selected and it indicates a value of 0 while each choice selected would indicate a divided value from the ideal total meaning that on a comprehensive result all options would be fulfilled, and the result is value 1. In the third case, where there are three options but only one which you can select, the calculation would be based on the selected option meaning that the 'poor' option indicates value 0, 'sufficient' option value 0,5 and 'excellent' value 1. By taking into consideration all these cases it is possible to summarize the maximum number of values and calculate what is the share that each supplier received compared to the ideal result. As a note, if some supplier responses as 'not applicable' to some question, the ideal result should be minus the ideal result of that question from the overall ideal sum of the assessment.

The numerical values in the case of circular materials, for instance, are dependent on the chosen production process and in the case of emissions dependent on company size and sales portfolio. Thus, the background information would be needed to evaluate those results equally between suppliers. However, even if the numbers and verbal responses are not evaluated based on given values there is no reason why not to collect that information in order to build awareness and collect data on those issues as well. Therefore, those responses are evaluated based on the existence of the response. In other words, if a supplier can give the percentage of circular material or disclose the annual emissions the supplier will get a value of 1 since the supplier shows anyway maturity in being capable of providing such sustainability-related data.

The more advantageous option in evaluation is to take into account the weighted importance of different indicators between each category. This option is exemplified by adding

weighting to a calculation by changing internal evaluated average importance values from 3, 3.5 and 4 to match values 1, 2 and 3. By that, it is possible to differentiate suppliers, if some indicators are considered to have a more important role in the evaluation of each purchasing category. For instance, if climate and environmental related questions are seen as a priority when evaluating steel category suppliers, then those indicators can have bigger value. However, this thesis proposes that if weighting is decided to be applied, the weighting results from this study (expert questionnaire) are being re-reviewed and thought of specifically from each category's point of view with a more limited number of indicators.

The created evaluation method is relatively simple, but the simplicity also gives the case company possibility to implement this kind of assessment quite easily. And as it can be seen from the pilot results within steel category suppliers presented in table 10, it is already possible to see differences between suppliers when the proposed evaluation method was applied in the pilot assessments. If embedding these results into supplier classification, it can be decided by the case company whether it is more meaningful to present the result with the percentage value or if the percentages would be converted to match numerical values, for example, by giving suppliers having percentage between 1-10% the value 1, suppliers having percentage between 10-20% the value 2 et cetera while supplier having percentage between 90-100% would be given the value 10. The formatted scale can be also modified to be, for example, denser or, whatever is seen as the best scale to present the supplier's sustainability performance. The calculation values can be reviewed from appendices III, IV and V.

Table 10. Steel category suppliers' sustainability assessment results with the proposed evaluation method.

Steel Category					
Supplier 1 result	**Supplier 2 result**	**Supplier 3 result**	**Supplier 1 weighted result**	**Supplier 2 weighted result**	**Supplier 3 weighted result**
67 %	96 %	79 %	61 %	96 %	68 %

7.2 Proposal 2: Selecting a few key indicators

The second proposal for the case company is to select only a couple of key indicators which would be embedded in the supplier classification process. That would mean that, for example, in the steel category the internal evaluation showed that it was considered highly

important to evaluate whether the supplier has targets to reduce their CO2 emissions while in the facilities category it was considered highly important to ask whether the supplier has an effective whistleblowing channel in place. When thinking about the electronic components category, it could be assumed that in the case of conflict minerals, the usage of conflict minerals and a proper management system would be one of the key indicators to be asked from the suppliers.

However, taking into consideration the importance of “right” selected indicators, before further decisions on which indicators among selected groups should be included in supplier classification, this thesis highly suggests the case company have further discussion on which indicators to be embedded in supplier classification. By noting that the area of supplier sustainability evaluation is a relatively new topic in the case company's procurement, the decisions made need to be based on careful discussion and a common understanding of the priority areas both strategically at the corporate level and in procurement.

Also, it is suggested that if the company decides to select only a couple of key indicators for supplier classification, it would be made from a category perspective. This suggestion is based on the clear finding that different sustainability indicators were being weighted differentially between each three pilot categories. Therefore, findings support the need for selecting key indicators most relevant for each company’s purchasing categories separately. To exemplify the significance in practice, the case company has committed to the Science Based Targets Initiative which requires the case company to decrease the emissions of its steel purchases in the coming years. Hence, it is crucial to be able to direct the purchases towards suppliers that have lower emissions or are planning to decrease their own emissions. On the other hand, in the facilities category including suppliers that are service providers and work in customers’ facilities, it can be seen important that they hold an appropriate quality management system that ensures the customer gets the best possible quality service.

7.3 Proposal 3: Other usage possibilities of indicators

Even though this Thesis scope was more related to the supplier relationship management phase than the supplier selection phase, as it come up in the interview, there is also space for

improvement of supplier sustainability assessment already in the supplier onboarding phase. It was mentioned that the sustainability assessment could already take place in the supplier selection phase to ensure the decision are made based on the suppliers' sustainability performance as well. This was seen particularly important, for example, in the steel category where the suppliers' emissions should be paid more attention to. Therefore, it is suggested that the supplier sustainability assessment which was sent out in the supplier data collection pilot could be already used in the supplier onboarding phase, either for all suppliers or for selected high-risk categories, and complemented with other sustainability-related, onboarding phase questions that were left out in the presented assessments.

Furthermore, the wider assessment, created in this study could be used alternatively, for example, as a selective document when certain suppliers from the wider group are to be selected in audits against the Supplier Code of Conduct. In that case the self-assessment document would indicate which suppliers are seen as particularly important to audit based on the supplier sustainability self-assessment result. Also, as the supplier self-assessment tool was stated to have a tendency for social desirability bias at least for some of the high-risk suppliers are suggested to have an audit even if the self-assessment would indicate the supplier compliance. All the presented proposals given in this chapter have been combined to figure 17 below. The figure also proposes the actions based on the supplier's sustainability performance result. The suggested framework is very simplified and is recommended to be used to understand all the possible options and how those could be linked to the case company's existing processes.

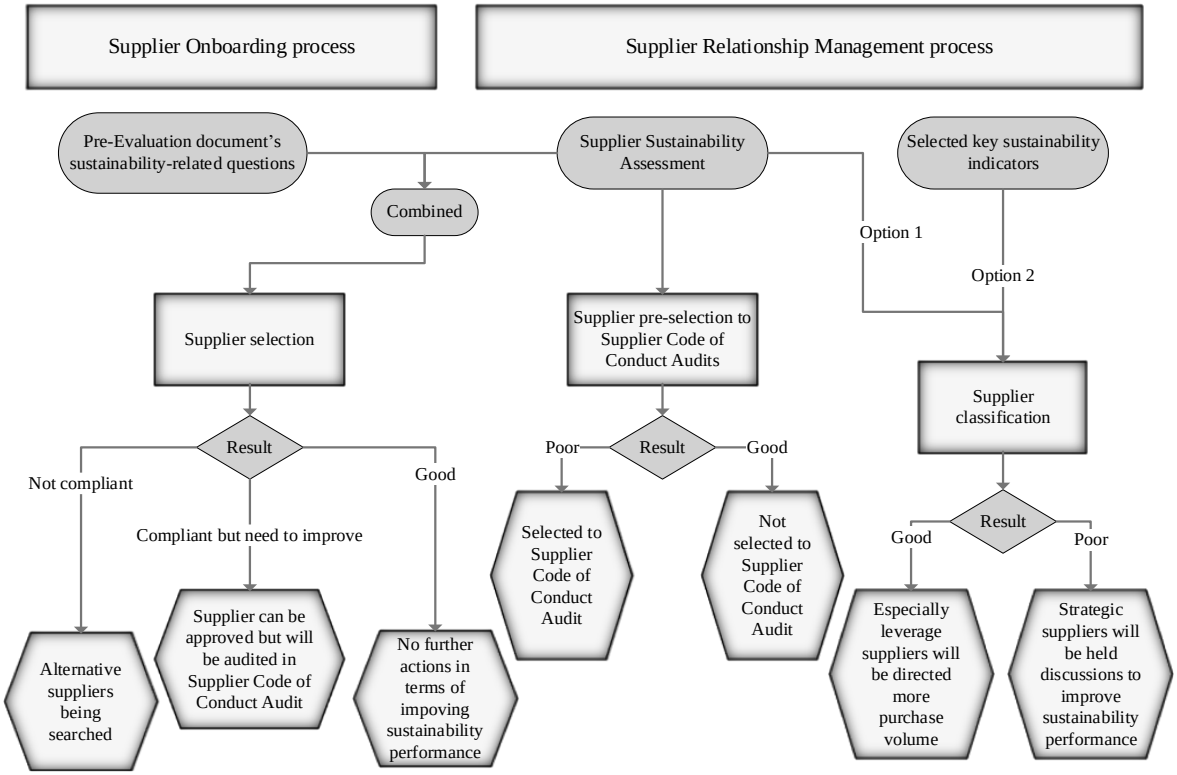

Figure 17. Further sustainability indicator utilization suggestions to the case company.

8 CONCLUSIONS

The theoretical framework and the case study part of this thesis have shown that supplier sustainability assessment and defining the key indicators according to which to measure the suppliers' sustainability performance is a complex topic, both in theory and in practice. From the case company's point of view, the initial driver of this thesis study was to find the most relevant sustainability indicators that could be embedded in the case company's supplier classification at some timeline. That would strengthen the case company's ongoing evaluation of its existing suppliers in terms of sustainability, in addition to economic indicators which are already in use. Therefore, this thesis built and conducted an empirical case study part in order to understand which sustainability indicators were seen as particularly important to evaluate from the suppliers by the case company's experts' point of view.

Firstly, the literature study part of this thesis was initialized by reviewing the current research in corporate sustainability and sustainable supply chain management. Also, it was reviewed how the case company evaluates its suppliers currently, in terms of sustainability. The key takeaway from the literature review was that the supplier assessment can result in positive improvements in suppliers' sustainability performance, however, mainly if it is combined with the supplier cooperation and development practices. Fundamentally, that means that if a company wants to improve their suppliers' sustainability performance, the assessment should always be followed by the needed actions, for example, supplier training and capacity building. However, if the company only wants to monitor the level of supplier sustainability, then it has to be noted that the supplier self-assessment tool can be affected by the social desirability bias, country differences, and language used, to mention a few. Those issues can be minimized by careful planning of assessment questions and monitoring only the key issues that are the most relevant to follow in order to mitigate supplier fatigue and increase the response rate.

The study showed that the case company's current practices to evaluate the suppliers' sustainability performance are relatively basic level and, thus it cannot be said to represent an advantage over other companies nor drive the whole corporate sustainability strategy

forward with its full potential. The main development actions to enhance the procurement's support for corporate sustainability strategy would be both starting to set stricter requirements for certain high-risk suppliers and categories already in the supplier onboarding phase as well as start monitoring key sustainability indicators also in the supplier relationship management phase. That would enable the case company to start truly selecting and directing its purchases toward the suppliers that are acting more sustainably.

The empirical part of this thesis showed that there are already many existing sustainability indicators and thus, it is challenging to identify the most important ones, also taking into account the feasible number of indicators. Some of the best-ranked indicators followed general or company level of compliance, while some can be considered more advanced. The more advanced indicators included in the case of the steel and electronic components category, for instance, the percentage of circular materials used in supplier's production as well as set targets to reduce carbon dioxide emissions and improve the energy efficiency of suppliers' own operations. Also, the target for increasing the use of renewable energy was considered as important indicator among these two categories. On the other hand, in the facilities category the possible evidence of child labour, proper management systems and, the existence of the employees' whistle blowing channel were issues considered as most relevant to follow. Still, it has to be noted that many of the indicators were evaluated on average between the 'important' and 'very important' and consisted of, for instance, indicators related to occupational health & safety training as well as proper policies for ensuring legal working hours, compensation, and prevention of discrimination.

The highest-ranked indicators were finally tested through a supplier pilot which consisted of a few suppliers from the steel and the facilities category. Based on the observations from the pilot, it can be said that responded suppliers were well able to give the requested information which supported the understandability, and usability of the self-assessment tool and selected indicators. However, it was also found that even if the sample was really limited, the suppliers' sustainability performance and capability to provide information accurately varied, especially in the steel category. On the other hand, in the facilities category, the results were more aligned because the social issues are more challenging to measure through, for example, numerical values. That supports the need for also having more academic

research on the usage of supplier self-assessment tools to measure, especially social issues of the suppliers.

In the future, it is recommended that the case company carefully plans which suppliers are to be assessed and what is the target of assessing the suppliers. In addition, it should be clarified what would be taken actions based on the assessment results so that the assessment would not be made only for the sake of assessing but really to support either the case company's own corporate sustainability strategy implementation or the supplier's sustainability performance and capacity building. This ensures that the suppliers' fatigue and resources are being acknowledged and the company has a clear sustainable development value-based ambition to drive its sustainable supply chain management forward.

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Sustainability dimension	Sustainability category	Sustainability aspect	Question	Results		
Environment				**S**	**FA**	**EC**
	Materials	Avoidance of hazardous materials in product or production	Does your company maintain up-to-date material safety data sheets (MSDS) for all hazardous substances used on-site?	3	2	3,5
			Can you confirm that the materials/parts/products/packaging /services you deliver to Konecranes do not contain or you do not use prohibited substances and you inform Konecranes of reportable substances as defined in Konecranes restricted substances list (see https://www.konecranes.com/suppliers/becoming-supplier)?	3	2	3,5
		Use of conflict minerals	If your company uses tin (Sn), tantalum (Ta), tungsten (W) or gold (Au), does your company have a policy statement and/or management system that addresses conflict minerals?	2,5	1,5	3
		Cleaner production and eco-efficiency	What is the main technology used to produce steel material you are supplying to Konecranes? a. Blast furnace- basic oxygen furnace (BF-BOF) b. Scrap based- electric arc furnace (Scrap based EAF) c. Direct reduced iron- electric arc furnace (DRI-EAF) d. Other (specify)	3	1	2,5
		Substitution of unnatural compounds	If known, what is the share of recycled material in your production? Please also inform the percentage of recycled material.	4	0	3,5
			Does your company have a targets and programme to increase the use of recycle materials or/and to reduce the use of virgin materials?	3,5	0	3
	Wastes	Waste prevention, reuse, collection, separation, recovery, safe disposal	Does your company have a recycling program and/or targets to reduce or eliminate pollution and volume of waste generated in its operations?	2	0,5	2
			Does your company maintain records of off-site transfer, treatment, and disposal of waste?	1,5	0	1,5
			Does your company have a program and/or procedures to manage and dispose of hazardous waste (if applicable), wastewater, solid waste, and airborne emissions?	3,5	2	3,5
			Does your company conduct tests to identify impact on soil and groundwater from facility operations?	3	1	2,5
	Emissions	Reduction and prevention of Greenhouse Gas Emission and Carbon Footprint	Does your company have set publicly available targets to reduce GHG emissions?	4	2	3,5
			What is the total annual Scope 1and Scope 2 Greenhouse Gas (GHG) emissions in the most recent year measured? Please enter in total metric tons carbon dioxide equivalent [CO2e].	4	0	3,5
			Does the facility report GHG emissions and climate change strategy to the Carbon Disclosure Project (CDP) or publicly disclose an equivalent amount and type of information on an annual basis?	2,5	0,5	2
			Has your company committed to The Science Based Targets initiative (SBTi)?	3,5	0	3

		Reduction and prevention of other gases than CO2 into air	Does your company's facilities have a system in place to manage and monitor air emissions?	2	0	1,5
			Does your company's facilities have set targets in relation to reducing air emissions?	2	0	1,5
	Energy	Production of energy efficienct products and services	Does your company have a program and/or targets to reduce the use of energy in your products?	3,5	2	3,5
		Energy efficient production, initiatives to reduce direct/indirect energy consumption	Does your company have set targets in relation to increased energy efficiency and reduction of direct/indirect energy consumption in your production?	3,5	0	3,5
		Use of Renewable energy	Has your company set targets to increase the use of renewable energy in production operations?	3,5	0	3,5
			If known, what is the percentage of renewable energy used in your operations at the moment?	2,5	0	2,5
	Water	Water consumption/reuse of water/water footprint	Does your company have a system in place to manage and monitor water withdrawals, consumption and wastewater generation?	3	0	3
			Does your company have a program and/or targets to reduce water use or reuse/recycle water?	2,5	0	2,5
Social				**S**	**FA**	**EC**
	Business Ethics	Corruption and bribery	Does your company have an own Anti-Corruption / Bribery policy?	3	3,5	3,5
			Does your company assess the risk of corruption when doing business (select which of the following topics have been covered)? - Evaluation of the potential areas of corruption such as type of transaction, countries of operation, industries, and customers of business partners - Evaluation of the risk when employees, agents, intermediaries or consultants deal with public officials (including state owned companies) - Evaluation of the risk of internal and external conflicts of interest in relation to business partners - Development of adequate policies and processes to address the risk of corruption, and definition of responsibilities for each task, as a minimum for high-risk areas	2,5	3	3
	Human Rights	Prohibition of child labour	Does the facility employ child labour (workers younger than 14 or 15) or has there been findings in relation to child labour, for example during the third-party Audits in past three years?	2,5	4	3,5
			Do any young workers (above the legal minimum age, but under the age of 18) perform night work, hazardous jobs, or are they exposed to risks from chemicals, machinery, tools or excessive cold, heat, or noise?	2	3,5	3

		Prevention of forced and compulsory labour	Does your company have a written policy in terms of reducing the risk of forced / trafficked labour?	2	3	3
			Does your company's facility/facilities (or labour broker) withhold worker ID cards or passports?	1	3	2
			Are your company's workers required to deposit money prior to or during employment?	1	3	2
		Discrimination	Does your company have written personnel policies in place for its hiring, salary, benefits, termination, and/or retirement practices to prevent discrimination?	2,5	3,5	3
		Freedom of association and collective bargaining/protection of worker's representatives	Are your company's workers free to join or not to join form trade unions or workers' organizations of their own choosing and collectively bargain?	2,5	3	3
			Are employees in your company's facility/facilities able to participate democratically in the selection of representatives for labour organizations (if applicable)?	2	2,5	2,5
	Occupational Health and Safety	Accidents/ lost days/ fatalities	Has the facility operated without serious injury and/or fatality over the past year?	3	3,5	3
		OH&S trainings	Which of the following occupational health and safety matters are your employees trained? - Safety equipment - First aid training - Chemical management - Machinery safety - Maintenance - Workers' training	3,5	3,5	3
		Emergency preparedeness and response	Has your company conducted an occupational health & safety risk assessment? - Yes, by internal expertise - Yes, by external expertise - No, risk assessment has not been conducted	3,5	3,5	3
			Does your company's facility/facilities have procedures in place to ensure appropriate machinery is well maintained and equipped with necessary safety devices?	3	2,5	2,5
			Does your company's facility/facilities have procedures in place to ensure appropriate Personal Protection Equipment (PPE) is provided and used by all employees?	3	3	2,5
			Has the emergency response plan and fire evacuation procedure been communicated in language employees understand and practiced with all employees that could be affected by the emergency?	2,5	3	2,5
			Are all emergency exits unobstructed and unlocked from the inside at all times during working hours?	2,5	2,5	2,5
		Preventive and corrective actions	Has your company conducted audits of its environmental, labour or health, and safety management system(s) in the past three years?	3	3,5	3
			Are corrective actions identified by the environmental, labour, health, and safety audits tracked to closure?	3	3,5	3
			Does your company's facility/facilities have a process in place to evaluate and update environmental, social, and	2,5	3	3

			governance policies and systems on an on-going basis?			
	Employment Conditions	Valid use of contract, contingent or temporary workers	Does the company's facility/facilities have procedures to ensure freedom of movement of contract workers is not unreasonably restricted?	1,5	3	2
			Does the company's facility/facilities have a system in place to ensure that contract labour providers adhere to all relevant labour laws?	2	3	3
			Are all employees provided a written employment agreement with the facility in a language that they understand?	2,5	3,5	3
			Does the facility maintain a personnel file on every employee?	2	3	2,5
	Training and education	Employee training	On which of the following topics have you organised training sessions to workers/staffs in the past 12 months: – Code of Conduct – Social Issues – Anti-Corruption & Ethics – Occupational Health & Safety – Environmental Issues	2	2,5	2,5
	Emplyment Conditions	Securing minimum and living wages	Does your company have procedures in place to ensure all workers are paid at least the legal minimum wage for standard working hours?	2	3,5	3
			Are the remuneration paid and benefits provided at least equivalent to the national standard or minimum standard of the relevant national sector?	0,5	0	1,5
		Respects for legal working hours and provision of overtime compensation	To ensure respects for legal working hours and provision of overtime compensation, related to which of the following topics does the company have procedures in place? - All workers are given at least one day off in seven - All overtime performed at the facility is voluntary - All workers are paid the legal overtime rate - All payroll documents indicate all hours worked	2	3,5	3
	Company culture	Employee interviews/ communication	Does your company's facility/facilities have effective grievance procedures in place to allow employees to bring environmental and/or work-related violations and/or concerns to management's attention in an anonymous manner without fear of retribution?	3	4	3,5
		Measures to prevent sexual abuse and harassment at work	Does your company's facility/facilities have a formal, written policy to ensure the workplace is free of physical abuse, corporal punishment, physical contact with the intent to injure or intimidate, and disciplinary measures that cause physical discomfort?	2,5	3,5	3
	Community engagement	Local communities	Does your company invest in community development activities in the markets you source from and/or operate within?	2	2	2,5
Governance				**S**	**FA**	**EC**
	Management Systems	Environmental management system	Does your company's facility/facilities have an up-to-date certified Environmental Management System (ISO 14001) in place?	4	3,5	3,5
		Quality management system	Does your company's facility/facilities have an up-to-date certified Quality Management System (ISO 9001) in place?	4	4	3,5

		Health & Safety management system	Does your company's facility/facilities have an up-to-date certified Health & Safety Management system (ISO45001) in place?	4	3,5	3,5
	Designation of responsibility to achieve SD objectives	Top-management involvement	In which of the following topics does your company have a management person responsible for a. Social Sustainability b. Business Conduct & Compliance c. Environmental Sustainability d. Health & Safety	3	2	2,5
	Sustainability Strategies	Learning and awarness raising for employees within organization	Does your company organise training sessions to enhance the understanding of Corporate Social Responsibility/Sustainability at your facilities?	1,5	1,5	2
			Have your company's employees from your facilities participated in external Corporate Social Responsibility/Sustainability training?	1	1,5	2
		Life cycle approach (consideration of whole product life cycle in decisions)	Does your company use life cycle assessment (LCA) as part of determining chemical selection for product inputs?	1,5	0,5	2
			Does your company consider Design for Environment (DfE) in its development of products?	3,5	0	3
			Does your company use chemical hazard assessment and/or comparative chemical hazard assessment as part of determining chemical selection for product inputs?	3	1,5	3
			Does any of your company's products include EU Ecolabels?	1	0,5	2
	Code of Conduct	Ethics code of conduct	Does your company have an own Code of Conduct or ethical business code?	2,5	3	3
			Is your company able to meet requirements defined in Konecranes Supplier Code of Conduct (see: https://www.konecranes.com/suppliers/becoming-supplier)?	3,5	4	3,5
	Sustainable supply chain management	Evaluation of suppliers' sustainability performance	Does your company require its suppliers to publicly disclose key ESG information, including policies, programs, and performance?	1,5	1,5	2
			Does your company have an own Supplier Code of Conduct/ Sustainability Policy?	1,5	1,5	1,5
			Does your company communicate its Supplier Code of Conduct/Sustainability policy (if existing) to its suppliers?	1,5	1,5	1,5
			Which of the following processes do you have in place to ensure and monitor that your Supplier Sustainability Policy is efficiently implemented by your suppliers? – Self-assessment questionnaire – Audits conducted by the company – Supply meetings – Audits conducted by an external 3rd party auditor – None	1,5	1,5	1,5

Internal Expert Survey:

Bolded questions are the four main research questions of the Thesis and are being used as a base for further expert survey questions.

1. **What are the current ways to evaluate suppliers' sustainability performance in case company's procurement and how well those are inline, with the case company's corporate sustainability strategy?**
    a. Do you see that current tools to evaluate supplier sustainability performance (Annual Audits, Supplier Code of Conduct Audits and, Supplier Code of Conduct signings) are;
        i. in line with the current corporate strategy, in other words, does the procurement evaluate the right things in the right ways from the corporate strategy point of view?
        ii. sufficient to drive corporate sustainability strategy forward?

2. **What are the priority sustainability indicators for the case-company to monitor and evaluate with its suppliers that operate in different industries?**
    a. Currently, in the company's supplier classification, the only sustainability-related KPI is Supplier Code of Conduct signing. Without going through the Thesis' questionnaire results are there any specific "must ask" KPIs in your opinion that should be embedded in supplier classification?
    b. Do you think that the industry-wise KPI definition is needed or adding value meaning that KPIs might differ depending on the suppliers' industry or/and the importance of different KPIs is weighted differently depending on the industry?

3. **What is the suppliers' ability to provide sustainability related data and what is their sustainability performance based on the determined indicators?**
    a. In the practice, do you see this kind of "weblink questionnaire" would work in the supplier data collection in the future?

b. Do you see that requirement to provide sustainability data should be the same for all suppliers despite the industry that for example, have the same business volume for Konecranes?

4. What are the main development actions to enhance the procurement's tracking of suppliers' sustainability performance in the future?

a. For further development, which of the below option do you agree with;
    i. Supplier Sustainability Assessment can be used for pre-audit material to make decision whether to audit supplier or not
    ii. Supplier Sustainability Assessment is being sent to all strategic suppliers annually
    iii. Supplier Sustainability Assessment is being sent to all selected suppliers annually
    iv. Supplier Sustainability Assessment is being used in the supplier onboarding phase as additional material for selected suppliers
    v. Supplier Sustainability Assessment is used as a starting point to select smaller amount/couple of specific indicators that would be used in supplier classification
    vi. Other, word is free

b. From your point of view, what are the priority steps to enhance the procurement supplier’s sustainability evaluation in the future?

Supplier Sustainability Assessment Questions (Steel category)	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Weigthed importance	Ideal	Weigthed Ideal	Supplier 1 result	Supplier 2 result	Supplier 3 result	Supplier 1 weighted result	Supplier 2 weighted result	Supplier 3 weighted result
Environment															
Does your company maintain up-to-date material safety data sheets (MSDS) for all hazardous substances used in production operations?	Yes (1)	No (0)	Not applicable (-1 from total maximum result)				1	1	1	1	1	1	1	1	1
Can you confirm that the materials/parts/products/packaging/services you deliver to Konecranes do not contain or you do not use prohibited substances and you also inform Konecranes of reportable substances as defined in Konecranes restricted substances list (see: https://www.konecranes.com/suppliers/becoming-supplier)?	Yes (1)	No (0)					1	1	1	1	1	1	1	1	1
What is the main technology used to produce the steel material you are supplying to Konecranes?	Blast Furnace-Basic Oxygen Furnace (BF-BOF) (0)	Scrap based-Electric Arc Furnace (Scrap based EAF) (1)	Direct Reduced Iron- Electric Arc Furnace (DRI-EAF) (0,5)	Not known (0)	Other (0)		1	1	1	1	1	0	1	1	0
If you responded *"Blast Furnace- Basic Oxygen Furnace (BF-BOF)"* to the previous question, does your company have a plan to change or develop the production process in the future?			*Question excluded from evaluation*												
What is the rate [%] of Circular Materials used in your company's offering?	If known (1)	Not known (0)					3	1	3	1	1	0	3	3	0
Does your company have a target and programme to increase the use of Circular Materials and to reduce the use of virgin materials in your company's offering? If yes, please inform a target and its time frame.	"Yes" response (1)						2	1	2	0	1	0	0	2	0
Does your company have a system to manage proper disposal of the following waste types?	Hazardous waste Yes (0,33...) No (0)	Solid waste Yes (0,33...) No (0)	Wastewater Yes (0,33...) No (0)				2	1	2	1	1	1	2	2	2
Does your company conduct tests to identify the impact on soil and groundwater from production operations?	Yes (1)	No (0)	Not applicable (-1 from total maximum result)				1	1	1	(-1 from total maximum result)	1	(-1 from total maximum result)	(-1 from total maximum result)	1	(-1 from total maximum result)
What is your company's total amount of Greenhouse Gas (GHG) emissions including Scope 1 and Scope 2 in the most recent year measured? Please enter in total metric tons carbon dioxide equivalent [CO2e] in a year. Please inform also the year when emissions were measured.	If known (1)	Not known (0)					3	1	3	0	1	1	0	3	3
Has your company set publicly available targets to reduce its Greenhouse Gas (GHG) emissions on annual basis?	Yes (1)	No (0)					3	1	3	0	1	1	0	3	0
Does your company define and monitor Greenhouse Gas (GHG) emissions per product type?	Yes, for all product types (1)	Yes, for some product types (0,5)	No (0)				1	1	1	0	1	0,5	0	1	0,5
Has your company committed to The Science Based Targets initiative (SBTi)?	Yes (1)	No (0)					2	1	2	0	1	0	0	2	0
Has your company set a target and/or programme to improve the energy efficiency of your offering?	Yes (1)	No (0)	Not applicable (-1 from total maximum result)				2	1	2	1	1	(-1 from total maximum result)	2	2	(-2 from total maximum result)
Has your company set an energy efficiency target for its operations?	Yes (1)	No (0)	Not applicable (-1 from total maximum result)				2	1	2	0	1	(-1 from total maximum result)	0	2	(-2 from total maximum result)
Is your company using Renewable Electricity (RE) in its own operations?	Yes, the share of RE > 80% of Total Electricity Consumption (1)	Yes, the share of RE > 50% of Total Electricity Consumption (0,75)	Yes, the share of RE > 20% of Total Electricity Consumption (0,5)	Yes, the share of RE < 20% of Total Electricity Consumption (0,25)	Yes, but the share of RE of Total Electricity Consumption is not known (0,25)	No (0)	2	1	2	1	0,25	1	2	0,5	2
Has your company set a target to increase the use/share of Renewable Electricity (RE) in its own operations?	Yes (1)	No (0)					2	1	2	0	1	1	0	2	2
Does your company have a system in place to monitor the following water-related issues?	Water withdrawals Yes (0,5) No (0) Not applicable (-0,5 from maximum result)	Wastewater generation Yes (0,5) No (0) Not applicable (-0,5 from maximum result)					1	1	1	(-1 from total maximum result)	1	1	(-1 from total maximum result)	1	1
Does your company consider Design for Environment (DfE) in its development of products/production processes?	Yes (1)	No (0)	Not applicable (-1 from total maximum result)				2	1	2	0	1	(-1 from total maximum result)	0	2	(-2 from total maximum result)
Does your company use chemical hazard assessment as a part of determining chemical selection for product inputs that your company delivers to Konecranes?	Yes (1)	No (0)	Not applicable (-1 from total maximum result)				1	1	1	(-1 from total maximum result)	1	(-1 from total maximum result)	(-1 from total maximum result)	1	(-2 from total maximum result)
Optional comments/additional explanations related to questions presented in the "Environment" section. *Please write a question number you are referring to before the comment.*			*Question excluded from evaluation*												
Health & Safety															
Has your company operated without a serious injury and/or fatality over the past year?	Yes (1)	No (0)					1	1	1	0	1	1	0	1	1
Which of the following occupational health and safety matters are your company's employees trained for?	Safety equipment (0,2)	First aid training (0,2)	Chemical management (0,2)	Machinery safety (0,2)	Maintenance (0,2)	Other (0,2)	2	1	2	1	1	1	2	2	2
Has your company conducted an occupational health & safety risk assessment?	Yes, by internal and external expertise (1)	Yes, by internal expertise (0,5)	Yes, by external expertise (0,5)	No (0)			2	1	2	1	1	1	2	2	2
Does your company have procedures in place to ensure appropriate machinery is well maintained and equipped with necessary safety devices?	Yes (1)	No (0)	Not applicable (-1 from total maximum result)				1	1	1	1	1	1	1	1	1
Does your company have procedures in place to ensure appropriate Personal Protection Equipment (PPE) is provided to and used by all employees?	Yes (1)	No (0)	Not applicable (-1 from total maximum result)				1	1	1	1	1	1	1	1	1
Optional comments/additional explanations related to questions presented in the "Health & Safety" section. *Please write a question number you are referring to before the comment.*			*Question excluded from evaluation*												

Social & Governance													
Does your company have an Anti-Corruption / Bribery policy?	Yes (1)	No (0)				1	1	1	1	1	1	1	1	1
Is your company able to meet requirements defined in Konecranes Supplier Code of Conduct (see: https://www.konecranes.com/suppliers/becoming-supplier)?	Yes (1)	No (0)				2	1	2	1	1	1	2	2	2
Does your company have effective whistle blowing channel in place to allow employees to bring environmental and/or work-related ethical violations/concerns to management's attention in an anonymous manner without fear of retaliation?	Yes (1)	No (0)				1	1	1	1	1	1	1	1	1
For which of the following management systems has your company conducted audits on in the past three years?	Environmental Management System (0,25)	Labor Management System (0,25)	Health & Safety Management System (0,25)	Quality Management System (0,25)	None of the above (0)	1	1	1	1	0,75	0,75	1	0,75	0,75
Are corrective actions identified by the Environmental, Labor, Health & Safety and/or Quality audits tracked to closure?	Yes, all corrective actions are tracked to closure (1)	Not fully, only selected corrective actions are tracked to closure (0,5)	No, corrective actions are not tracked to closure (0)	Not applicable (-1 from total maximum result)		1	1	1	1	1	1	1	1	1
Which of the following certified management systems does your company have in place?	Environmental Management System (ISO 14001) (0,33...)	Quality Management System (ISO 9001) (0,33...)	Health & Safety Management System (ISO 45001) (0,33...)	None of the above (0)		3	1	3	1	1	2/3	3	3	2
For which of the following topics does your company have a responsible management person?	Social Sustainability (0,25)	Environmental Sustainability (0,25)	Health & Safety (0,25)	Business Conduct & Compliance (0,25)	None of the above (0)	1	1	1	1	1	0,75	1	1	0,75
Optional comments/additional explanations related to questions presented in the "Social and Governance" section. *Please write a question number you are referring to before the comment.*	*Question excluded from evaluation*													
Overall results							**30**	**49**	**67 %**	**97 %**	**79 %**	**61 %**	**96 %**	**68 %**

Supplier Sustainability Assessment Questions (Facilities category)	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Weigthed importance	Maximum result	Weigthed maximum result	Supplier 1 result	Supplier 2 result	Supplier 3 result	Supplier 1 weighted result	Supplier 2 weighted result	Supplier 3 weighted result
Health & Safety															
Has your company operated without a serious injury and/or fatality over the past year?	Yes (1)	No (0)					2	1	2	1	1	1	2	2	2
Has your company conducted an occupational health & safety risk assessment?	Yes, by internal and external expertise (1)	Yes, by internal expertise (0,5)	Yes, by external expertise (0,5)	No (0)			2	1	2	1	1	1	2	2	2
Which of the following occupational health and safety matters are your company's workers trained for?	Safety equipment (0,2)	First aid training (0,2)	Chemical management (0,2)	Machinery safety (0,2)	Maintenance (0,2)	Other (0,2)	2	1	2	1	1	1	2	2	2
Does your company have procedures in place to ensure appropriate Personal Protection Equipment (PPE) is provided to and used by all workers?	Yes (1)	No (0)	Not applicable (-1 from total maximum result)				1	1	1	1	1	1	1	1	1
Has the emergency response plan and fire evacuation procedure been communicated in language workers understand and also practiced with all workers that could be affected by the emergency?	Yes, communicated and practised (1)	Not fully, communicated but not practised (0,5)	No, not communicated or practised (0)				1	1	1	1	1	1	1	1	1
Optional comments/additional explanations related to questions presented in the "Health & Safety" section. *Please write a question number you are referring to before the comment.*			*Question excluded from evaluation*												
Social															
Does your company have a written policy in terms of reducing the risk of forced/trafficked labour?	Yes (1)	No (0)					1	1	1	1	1	1	1	1	1
Does your company employ workers younger than 15 or has there been findings in relation to child labour, for example during the third-party Audits in past three years?	Yes (0)	No (1)					3	1	3	1	1	1	3	3	3
Do any young workers (above the legal minimum age, but under the age of 18) perform night work, hazardous jobs, or are they exposed to risks from chemicals, machinery, tools or excessive cold, heat, or noise?	Yes (0)	No (1)	Not applicable (-1 from total maximum result)				2	1	2	1	1	1	2	2	2
Does your company (or labor broker) withhold workers' ID cards or passports?	Yes (0)	No (1)					1	1	1	1	1	1	1	1	1
Are your company's workers required to deposit money prior to or during employment?	Yes (0)	No (1)					1	1	1	1	1	1	1	1	1
Are all workers provided a written employment agreement in a language that they understand?	Yes (1)	No (0)					2	1	2	0	1	1	0	2	2
Does your company maintain a personnel file on every worker?	Yes (1)	No (0)					1	1	1	1	1	1	1	1	1
To which of the following topics does your company have a written policy in place to prevent worker discrimination?	Hiring (0,2)	Salary (0,2)	Benefits (0,2)	Termination (0,2)	Retirement (0,2)	None of the above (0)	2	1	2	1	1	1	2	2	2
Does your company have procedures to ensure freedom of movement of workers is not unreasonably restricted?	Yes (1)	No (0)					1	1	1	1	1	1	1	1	1
Are your company's workers free to join or not to join trade unions or workers' organizations of their own choosing and collectively bargain?	Yes (1)	No (0)					1	1	1	1	1	1	1	1	1
Does your company have a written policy to ensure the workplace is free of physical abuse, corporal punishment, physical contact with the intent to injure or intimidate, and disciplinary measures that cause physical discomfort?	Yes (1)	No (0)					2	1	2	1	1	1	2	2	2
Which wage level does your company provide to all workers for standard working hours?	Can't guarantee legal minimum wage/minimum standard of the relevant national sector (0)	At least legal minimum wage/minimum standard of the relevant national sector (0,5)	Living wage (i.e. wage sufficient to meet basic food, clothing and housing needs and provide some discretionary income for workers and their dependents) (1)				2	1	2	0,5	0,5	0,5	1	1	1
Which of the following issues does the company have procedures in place to ensure respect for legal working hours and provision of overtime compensation?	All workers are given at least one day off in seven (0,2)	All overtime performed at the facility is voluntary (if not otherwise agreed in collective agreements) (0,2)	All workers are paid the legal overtime rate (0,2)	All payroll documents indicate all hours worked (0,2)	Working hours are within local legal limits (0,2)	None of the above (0)	2	1	2	1	1	1	2	2	2
Does your company have a system in place to ensure that contract labor providers adhere to all relevant labor laws?	Yes (1)	No (0)	Not applicable (-1 from total maximum result)				1	1	1	(-1 from total maximum result)	(-1 from total maximum result)	(-1 from total maximum result)	(-1 from total maximum result)	(-1 from total maximum result)	(-1 from total maximum result)
Optional comments/additional explanations related to questions presented in the "Social" section. *Please write a question number you are referring to before the comment.*			*Question excluded from evaluation*												
Governance															
Does your company have an Anti-Corruption / Bribery policy?	Yes (1)	No (0)					2	1	2	1	1	1	2	2	2
Does your company assess and manage the risk of corruption when doing business (select which of the following topics have been covered)?	Potential areas of corruption such as type of transaction, countries of operation, industries, and customers of business partners (0,25)	Risk when employees, agents, intermediaries or consultants deal with public officials (including state owned companies) (0,25)	Risk of internal and external conflicts of interest in relation to business partners (0,25)	Development of adequate policies and processes to address the risk of corruption, and definition of responsibilities for each task, as a minimum for high-risk areas (0,25)	None of the above (0)		1	1	1	1	1	1	1	1	1
Does your company have an own Code of Conduct or ethical business code?	Yes (1)	No (0)					1	1	1	1	1	1	1	1	1

Is your company able to meet requirements defined in Konecranes Supplier Code of Conduct (see: https://www.konecranes.com/suppliers/becoming-supplier)?	Yes (1)	No (0)				3	1	3	1	1	1	3	3	3
Does your company have an effective whistle blowing channel in place to allow workers to bring environmental and/or work-related ethical violations/concerns to management's attention in an anonymous manner without fear of retaliation?	Yes (1)	No (0)				3	1	3	1	1	1	3	3	3
Does your company have a process in place to evaluate and update Environmental, Social, Health & Safety and Governance policies and systems on an on-going basis?	Yes (1)	No (0)				1	1	1	1	1	1	1	1	1
For which of the following management systems has your company conducted audits on in the past three years?	Environmental Management System (0,25)	Labor Management System (0,25)	Health & Safety Management System (0,25)	Quality Management System (0,25)	None of the above (0)	2	1	2	1	1	1	2	2	2
Are corrective actions identified by the Environmental, Labor, Health & Safety and/or Quality audits tracked to closure?	Yes, all corrective actions are tracked to closure (1)	Not fully, only selected corrective actions are tracked to closure (0,5)	No, corrective actions are not tracked to closure (0)	Not applicable (-1 from total maximum result)		2	1	2	1	1	1	2	2	2
Which of the following certified management systems does your company have in place?	Environmental Management System (ISO 14001) (0,33...)	Quality Management System (ISO 9001) (0,33...)	Health & Safety Management System (ISO 45001) (0,33...)	None of the above (0)		3	1	3	1/3	1/3	1/3	3	3	3
Optional comments/additional explanations related to questions presented in the "Governance" section. *Please write a question number you are referring to before the comment.*	*Question excluded from evaluation*													
Overall Results							**28**	**48**	**92 %**	**96 %**	**96 %**	**94 %**	**98 %**	**98 %**

Supplier Sustainability Assessment Questions (Electronic components category)	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
Environment						
Does your company maintain up-to-date material safety data sheets (MSDS) for all hazardous substances used in production operations?	Yes (1)	No (0)	Not applicable (-1 from total maximum result)			
Can you confirm that the materials/parts/products/packaging/services you deliver to Konecranes do not contain or you do not use prohibited substances and you also inform Konecranes of reportable substances as defined in Konecranes restricted substances list (see: https://www.konecranes.com/suppliers/becoming-supplier)?	Yes (1)	No (0)				
If your company uses tin (Sn), tantalum (Ta), tungsten (W) or gold (Au), does your company have a policy statement and/or management system that addresses conflict minerals?	Yes (0)	No (1)	Not applicable (-1 from total maximum result)			
What is the rate [%] of Circular Materials used in your company's offering?	If known (1)	Not known (0)				
Does your company have a target and programme to increase the use of Circular Materials and to reduce the use of virgin materials in your company's offering? If yes, please inform a target and its time frame.	"Yes" response (1)					
Does your company have a system to manage proper disposal of the following waste types?	Hazardous waste Yes (0,33...) No (0)	Solid waste Yes (0,33...) No (0)	Wastewater Yes (0,33...) No (0)			
What is your company's total amount of Greenhouse Gas (GHG) emissions including Scope 1 and Scope 2 in the most recent year measured? Please enter in total metric tons carbon dioxide equivalent [CO_2e] in a year. Please inform also the year when emissions were measured.	If known (1)	Not known (0)				
Has your company set publicly available targets to reduce its Greenhouse Gas (GHG) emissions on annual basis?	Yes (1)	No (0)				
Has your company committed to The Science Based Targets initiative (SBTi)?	Yes (1)	No (0)				
Has your company set a target and/or programme to improve the energy efficiency of your offering?	Yes (1)	No (0)	Not applicable (-1 from total maximum result)			
Has your company set an energy efficiency target for its operations?	Yes (1)	No (0)	Not applicable (-1 from total maximum result)			
Is your company using Renewable Electricity (RE) in its own operations?	Yes, the share of RE > 80% of Total Electricity Consumption (1)	Yes, the share of RE > 50% of Total Electricity Consumption (0,75)	Yes, the share of RE > 20% of Total Electricity Consumption (0,5)	Yes, the share of RE < 20% of Total Electricity Consumption (0,25)	Yes, but the share of RE of Total Electricity Consumption is not known (0,1)	No (0)
Has your company set a target to increase the use/share of Renewable Electricity (RE) in its own operations?	Yes (1)	No (0)				
Does your company have a system in place to monitor the following water-related issues?	Water withdrawals Yes (0,5) No (0) Not applicable (-0,5 from maximum result)	Wastewater generation Yes (0,5) No (0) Not applicable (-0,5 from maximum result)				

Does your company use chemical hazard assessment as a part of determining chemical selection for product inputs that your company delivers to Konecranes?	Yes (1)	No (0)	Not applicable (-1 from total maximum result)			
Optional comments/additional explanations related to questions presented in the "Environment" section. *Please write a question number you are referring to before the comment.*			*Question excluded from evaluation*			
Health & Safety						
Has your company operated without a serious injury and/or fatality over the past year?	Yes (1)	No (0)				
Which of the following occupational health and safety matters are your company's employees trained for?	Safety equipment (0,2)	First aid training (0,2)	Chemical management (0,2)	Machinery safety (0,2)	Maintenance (0,2)	Other (0,2)
Has your company conducted an occupational health & safety risk assessment?	Yes, by internal and external expertise (1)	Yes, by internal expertise (0,5)	Yes, by external expertise (0,5)	No (0)		
Optional comments/additional explanations related to questions presented in the "Health & Safety" section. *Please write a question number you are referring to before the comment.*			*Question excluded from evaluation*			
Social						
Does your company have a written policy in terms of reducing the risk of forced/trafficked labour?	Yes (1)	No (0)				
Does your company employ workers younger than 15 or has there been findings in relation to child labour, for example during the third-party Audits in past three years?	Yes (0)	No (1)				
Do any young workers (above the legal minimum age, but under the age of 18) perform night work, hazardous jobs, or are they exposed to risks from chemicals, machinery, tools or excessive cold, heat, or noise?	Yes (0)	No (1)	Not applicable (-1 from total maximum result)			
Are all workers provided a written employment agreement in a language that they understand?	Yes (1)	No (0)				
To which of the following topics does your company have a written policy in place to prevent worker discrimination?	Hiring (0,2)	Salary (0,2)	Benefits (0,2)	Termination (0,2)	Retirement (0,2)	None of the above (0)
Are your company's workers free to join or not to join trade unions or workers' organizations of their own choosing and collectively bargain?	Yes (1)	No (0)				
Does your company have a written policy to ensure the workplace is free of physical abuse, corporal punishment, physical contact with the intent to injure or intimidate, and disciplinary measures that cause physical discomfort?	Yes (1)	No (0)				
Which wage level does your company provide to all workers for standard working hours?	Can't guarantee legal minimum wage/minimum standard of the relevant national sector (0)	At least legal minimum wage/minimum standard of the relevant national sector (0,5)	Living wage (i.e. wage sufficient to meet basic food, clothing and housing needs and provide some discretionary income for workers and their dependents) (1)			

Optional comments/additional explanations related to questions presented in the "Social" section. *Please write a question number you are referring to before the comment.*	*Question excluded from evaluation*				
Governance					
Does your company have an Anti-Corruption / Bribery policy?	Yes (1)	No (0)			
Does your company assess and manage the risk of corruption when doing business (select which of the following topics have been covered)?	Potential areas of corruption such as type of transaction, countries of operation, industries, and customers of business partners (0,25)	Risk when employees, agents, intermediaries or consultants deal with public officials (including state owned companies) (0,25)	Risk of internal and external conflicts of interest in relation to business partners (0,25)	Development of adequate policies and processes to address the risk of corruption, and definition of responsibilities for each task, as a minimum for high-risk areas (0,25)	None of the above (0)
Does your company have an own Code of Conduct or ethical business code?	Yes (1)	No (0)			
Is your company able to meet requirements defined in Konecranes Supplier Code of Conduct (see: https://www.konecranes.com/suppliers/becoming-supplier)?	Yes (1)	No (0)			
Does your company have an effective whistle blowing channel in place to allow workers to bring environmental and/or work-related ethical violations/concerns to management's attention in an anonymous manner without fear of retaliation?	Yes (1)	No (0)			
Does your company have a process in place to evaluate and update Environmental, Social, Health & Safety and Governance policies and systems on an on-going basis?	Yes (1)	No (0)			
For which of the following management systems has your company conducted audits on in the past three years?	Environmental Management System (0,25)	Labor Management System (0,25)	Health & Safety Management System (0,25)	Quality Management System (0,25)	None of the above (0)
Are corrective actions identified by the Environmental, Labor, Health & Safety and/or Quality audits tracked to closure?	Yes, all corrective actions are tracked to closure (1)	Not fully, only selected corrective actions are tracked to closure (0,5)	No, corrective actions are not tracked to closure (0)	Not applicable (-1 from total maximum result)	
Which of the following certified management systems does your company have in place?	Environmental Management System (ISO 14001) (0,33...)	Quality Management System (ISO 9001) (0,33...)	Health & Safety Management System (ISO 45001) (0,33...)	None of the above (0)	
Optional comments/additional explanations related to questions presented in the "Governance" section. *Please write a question number you are referring to before the comment.*	*Question excluded from evaluation*				
Overall Results					