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Supply Management

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The role of sustainability in supplier selection and evaluation

Examiners: Professor Anni-Kaisa Kähkönen & Junior researcher Kati Marttinen

ABSTRACT

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The role of sustainability in supplier selection and evaluation

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Keywords: Supplier selection process, supplier selection criteria, supplier evaluation, supplier monitoring, sustainability, sustainable supplier selection

The sustainability has received a lot of attention in organizations during the past decades. Companies should ensure their own sustainability but also their supply chains ‘sustainability. It is not an easy task because companies have long supply chains which include many suppliers. The aim of this thesis is to find out what is the role of sustainability in supplier selection and evaluation. In other words, how much emphasis sustainability has in supplier selection criteria and how complicate it is to monitor suppliers ‘sustainability.

This thesis is conducted by qualitative research method. The empirical data of the research has been collected via seven theme interviews from four different case companies. The analysis of the data was conducted by content analysis. The findings showed that the role of sustainability is very important and increasing in supplier selection process. The sustainable criteria are considered as a minimum requirement and the beginning of the supplier selection process is crucial in terms of ensuring sustainability. The evaluation and monitoring of supplier’s sustainability has a critical role. However, sustainability has not so much emphasis in monitoring than supplier selection process. All in all, the role of sustainability is increasing in the future and suppliers play a critical part of organizations responsibility.

TIIVISTELMÄ

Lappeenrannan–Lahden teknillinen yliopisto LUT

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Elisa Huurinainen

Vastuullisuuden rooli toimittajan valinnassa ja arvioinnissa

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Vastuullisuus on saanut paljon huomioita yrityksissä viime vuosikymmenten aikana. Yritysten täytyy varmistaa heidän oman vastuullisuutensa lisäksi myös toimitusketjujen vastuullisuus. Tämä ei ole helppo tehtävä, koska yritysten toimitusketjut ovat pitkiä ja ne sisältävät useita toimittajia. Tämän tutkielman tarkoitus on selvittää vastuullisuuden rooli toimittajan valinnassa sekä arvioinnissa. Toisin sanoen, Kuinka paljon yritykset painottavat vastuullisuutta valintakriteereissä ja kuinka monimutkaista on valvoa toimittajien vastuullisuuden toteutumista.

Tämä tutkielma on toteutettu laadullisella tutkimusmenetelmällä. Empiirinen aineisto on kerätty tekemällä seitsemän haastattelua neljästä eri case yrityksestä. Aineisto analyysi on toteutettu sisältöanalyysi menetelmää hyödyntäen. Tutkielman tulokset osoittavat, että vastuullisuuden rooli on todella tärkeä ja kasvava toimittajan valintaprosessissa. Tämän tutkimuksen mukaan vastuullisuus kriteerejä voidaan pitää minimi vaatimuksina ja toimittajan valintaprosessin alkua kaikista tärkeimpänä osana vastuullisuuden kannalta. Vastuullisuuden arvioimisen sekä valvomisen rooli on sen sijaan kriittinen. Kuitenkin vastuullisuuden roolilla ei ole niin paljon painoarvoa valvonnassa kuin toimittajan valintaprosessissa. Kaiken kaikkiaan, vastuullisuuden rooli on tulevaisuudessa kasvava ja toimittajat ovat kriittisiä tekijöitä yritysten vastuullisuudessa.

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1. Introduction

Current global world has a massive impact on our natural environment. The world uses excessively natural resources which causes harmful consequences for nature. However, the global business world has become a common marketplace and many corporations source products, components, materials, and services from global markets. Global manufacturing and transportation increase emission levels and speeds up global warming. (Zhong & Peng, 2015) In recent years industrial contamination and scarcity of raw material have raised attention (Goren, 2018). Environmental disasters have also increased and caused concern in the world (Molamohammadi, Ismail, Leman, & Zulkifl, 2013). Consequently, the sustainability requirements and responsibilities pressures have increased interest in sustainability. Due to these harmful consequences organizations try to act in a responsible way and avoid unethical operations.

The growing importance of the sustainability and protection of the environment has encouraged organizations to change their production systems more responsibly. (Connell, 2018, 283) Organizations aim to develop processes and manufacturing systems which save energy, produce less waste, protect resources and lead to less harmful consequences for nature and people (Liu & You, 2021, 7) However, it is relevant that organizations pay attention to their whole supply chain's sustainability (Zhu, Sarkis, & Lai, 2008). Many consumers have realized that supply chains need to have close monitoring and inspections. In other words, it creates pressure for organizations to monitor the whole supply chain's action because consumers are not just interested in the final product. Sustainable supply chain management requires organizations to monitor their supplier's material and information flows and ensure they meet customer needs. (Seuring, Sarkis, Müller & Rao, 2008b)

Suppliers have a crucial role in companies' operations, and they influence directly on product quality, costs, and release time on market (Humphreysa, Huangb, Caddena & McIvor, 2006). Hence, the supplier selection process has a critical role (Govindan, Rajendran, Sarkis, Murugesan, 2015). According to Amindoust, Shamsuddin, Saghafinia & Bahreininejad, (2012), sustainable supplier selection is the core function in the management of a responsible supply chain. Therefore, to succeed in managing the whole supply chain's

purchasing activities in a sustainable way, the supplier selection process is crucial. The raw materials are critical in the final product's features. Hence, the selection of proper raw materials and suppliers is vital in the aspect of sustainability (Molamohammadi, et al., 2013). It is significant that organizations consider the different supplier candidates and evaluate them deeply. Consequently, the supplier selection criteria and evaluation process has raised importance. Therefore, the sustainability requirements have changed the traditional supplier selection criteria and buyers' expectations of suppliers have changed. Most of the time buyers had paid attention to the supplier's offers of the price, quality and delivery time. (Shpend, Shahzad, Takala, Liu, Sillanpää, & Ali, 2015) Therefore, traditional supplier selection criteria focus on economic factors such as cost and quality (Goren, 2018). Nowadays many buyers expect their suppliers to pay attention to sustainability besides the traditional requirements. (Connell, 2018, 283) Hence, there has become a need for a sustainability-focused evaluation system (Luthra, Govindan, Devik; Kumar; Garg, & Prakash, 2017). The previous literature proves the amount of supplier selection criteria has increased because of sustainability requirements. Dickson (1966) has defined 23 attributes of traditional supplier selection in his seminal study. However, after decades the amount of supplier selection criteria has almost doubled because of the sustainability requirements. Amindoust et al. (2012) defined 29 attributes for only sustainable supplier selection. Hence, the supplier selection process is more complicated nowadays and it requires more time. The process complexity raises the importance of this study. However, this study provides a deeper understanding of the role of sustainability in the whole supplier selection process, not only the role of sustainability criteria. The findings show that sustainability criteria are considered as a minimum requirement and the supplier selection process has a critical role. All in all, sustainability requirements have led to the increasing dependency on suppliers which makes this research topic very important.

The sustainability concept includes three dimensions: environmental, social, and economic. It is crucial to consider all three dimensions in the supplier's selection process. In other words, suppliers should be able to maximize the income flow and protect the natural environment while also considering the moral and legal rights of people. (Molamohammadi, et al., 2013) According to these dimensions, buyers can form sustainable selection criteria and seek responsible suppliers who meet new requirements. However, sometimes buyers are not content with their supplier's action and they must rethink their plans. If buyers do not

have enough control of their suppliers' actions they might face hidden costs and risks. In the worst case, suppliers' actions in the supply chain might lead to ethical and environmental scandals (Guido & Sarkis, 2019). Hence, the one option is to end the sourcing collaboration or transfer it in house production (Trent, 2018, 253). To avoid these, it is important that organizations pay attention to supplier's sustainability.

This thesis focuses on exploring the role of sustainability in the supplier selection and evaluation processes. The study considers the role of sustainability in terms of a triple bottom line approach. The aim is to find out how important sustainable supplier selection criteria are for the case companies. In other words, how much case companies emphasize sustainability as an attribute of suppliers beside the traditional selection criteria. On the other hand, the target is to figure out how companies search for sustainable suppliers and how they form sustainable selection criteria. The other target is to find out the role of sustainability in supplier evaluation and monitoring. In other words, the aim is to explore what kind of consequences and challenges sustainability creates in supplier monitoring methods. All in all, the goal is to understand the role of sustainability in the supplier selection process and find out what kind of consequences sustainability might have in evaluation and monitoring practices of the suppliers.

1.1 Objectives and research questions

According to Cao, Ye, & Wang (2016), the interest in sustainability has been growing during the past decade and reporting of sustainable activities has increased. The customers' and shareholders' knowledge of sustainability have increased the organizations' pressures to be more responsible (Luthra, et al., 2017). In the field of supply management sustainability has also become an important factor and it has been noticed by many scholars during the many years (Govindan, et al., 2015). There is a huge amount of literature which is focused on the supplier selection meters. According to previous studies, the most dominant selection criteria have been quality and costs. (Mani & Delgado, 2018, 55) In other words, there are a lot of articles of the traditional selection criteria and evaluation of suppliers. Nevertheless, the previous literature has still limited the number of articles that consider sustainability issues (Govindan, et al., 2015). Therefore, it is not clear how significant is the role of sustainability in companies' supplier selection criteria. This thesis ensures the high importance of the

sustainability criteria beside the traditional criteria and findings show that sustainability criteria are almost a necessity. In addition, the previous literature is more focused on environmental supplier selection criteria and so called “green selection criteria”. However, the social and economic aspects need reinforcement (Zimmer, Fröhling & Schultmann, 2016). Therefore, consideration of the whole triple bottom line raises the importance of this study.

Because of the increasing globalization, the supply chains are more critical components in organizations. (Seuring, et. al. 2008b) This research topic is significant because it is current and conspicuous. The suppliers have an effective impact on the sustainability of the supply chain which increases the significance of the study. The topic is very interesting and relevant because the interest of sustainability is growing in organizations. In addition, sustainability is a worldwide phenomenon, and it is crucial for future generations (Elkington, 1998). In other words, it is vital to find some solutions for sustainability issues and support sustainable operations.

This study provides new aspects of the role of sustainability in the supplier selection and evaluation processes. For instance, this thesis compares traditional and sustainable supplier selection criteria together. In addition, it also presents the consequences of sustainability issues and the basic principles of sustainability. Furthermore, it provides suggestions on how sustainability requirements impact on the supplier's monitoring. The results of this thesis might be useful for organizations who collaborate with external partners and are keen to gather more knowledge of sustainability approaches. The objectives of this thesis are to examine the role of sustainability in supplier selection and evaluation. In other words, the thesis is focused to explore how significant criteria sustainability is in the supplier selection process. On the other hand, the thesis examines the supplier's sustainability evaluation challenges. The following three research questions has been formed to support this thesis:

The main research question is:

What is the role of sustainability in supplier selection and evaluation?

The first sub-question is:

How to make sustainable supplier selection?

The second sub-question is:

What are the challenges in monitoring and evaluating suppliers' sustainability?

1.2 Limitations

There are some limitations of the thesis to keep it clear and coherent. The most significant limitation is exploring only the role of sustainability. The sourcing process has been limited to focus on the selection and evaluation of the supplier. However, the supplier development process has been limited out of this thesis. The supplier selection process is focused on the selection criteria and different stages of the process. However, the supplier evaluation is focused on the different monitoring methods. In addition, the thesis addresses sustainability specifically from a triple- bottom line perspective because it gives a clear and encompassing structure. The supplier selection process pays attention only to the buyer's aspect. The target companies are limited to focus on industries which source raw materials and products. In other words, the case companies have broad supply management functions which ensure they have enough knowledge about the topic.

1.3 Key concepts

Sustainability refers to responsible behaviour which considers all the domains of the triple bottom line. The dimensions are divided into social, environmental, and economic perspectives. The core idea of sustainability is to use resources in a responsible way without causing harm to the future generations. (Elkington, 1998)

Supplier selection criteria include the decision variables which help buyers to evaluate, classify and find the best suppliers for the certain purchasing situation. Cost and quality are the most common examples of the traditional supplier selection criteria. In other words, supplier selection criteria help to identify potential suppliers who meet the organization's specific requirements. (Chan, Kumar, Tiwari, Lau & Choy, 2008)

Supplier evaluation includes methods which are conducted by the buyer. In the supplier evaluation process buyers rank potential suppliers in the order and decide which suppliers

earn the contract. When a supplier has earned a contract, the buyer continues evaluation and monitoring the supplier's performance. (Beil, 2010) On the other hand, supplier evaluation refers to supervising supplier action. Buyers periodically monitor supplier efficiency and evaluate their operations (Talluri & Sarkis, 2002).

Triple bottom line theory forms a triangle of three domains which determine the sustainability of a business. The three domains in the triple bottom line are economic, environmental, and social. Economic area focuses on the economic output of a business whose purpose is to maximize the utility of society overall. The environmental area focuses on a natural environment and pollution. It aims to be an eco-friendlier business by taking care of environmental issues. The last area of the triple bottom line is social, and it takes care of the welfare of people by resolving social problems. It aims for equality and healthiness. (Shim, Lee, Moon & Song, 2021)

1.4 Conceptual framework

The conceptual framework introduces the main concepts and forms the general view of the thesis' topic. It explains the main path of the research and summarizes the main concept's relationships. The figure 1 conceptual framework is presented below this chapter.

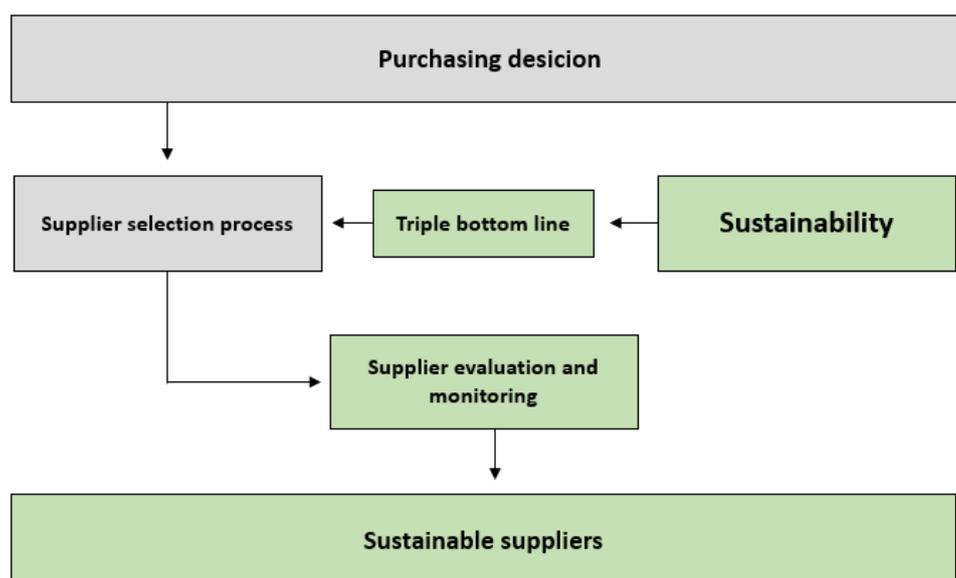


Figure 1. Conceptual framework of the thesis.

The conceptual framework in this thesis starts by purchasing decisions which deepens to the supplier selection process. In the next stage sustainability occurs and the triple bottom line affects the supplier selection process. In other words, supplier selection criteria are formed by considering the sustainability requirements. After the supplier selection the framework deepens to consider the supplier evaluation and monitoring. Lastly, the framework figures out the general role of sustainability in buyers' perspective in the supplier selection and evaluation.

1.5 Research methodology

The theoretical part of this study is formed by combining information from different scholars' articles. The theoretical framework was established from theories from different studies. The empirical part is implemented by using qualitative research methodology. The choice between quantitative and qualitative methods was made by the nature of the research topic. Qualitative research methods explain observations and interpret results. (Alasuutari, 2007, 44) The chosen research method is described more precisely in chapter 3. This thesis is conducted as a multiple case study. It refers to a case study approach which includes an elaborate description of the phenomenon that is explored. In other words, the idea of the case study is to provide a many-sided view of the topic in the specific context. (Halinena & Törnroos, 2005) After gathering the research data it is explored by comparing it to the theoretical part. Interpreting the comparison of theory and research data provides implications and answers to the research questions. The research data was gathered by interviewing 4 companies. The selection of the companies was made for industrial requirements. The main requirement was that the companies have a broad supply base and knowledge of supply chains. The main purpose of the interviews was to gather real-life experiences and evidence about the topic. It is relevant to note that this thesis' s qualitative research results are not universal. However, this study provides new aspects and more knowledge about the topic in general.

1.6 Structure of the thesis

The structure of the thesis consists of 5 main chapters which can be divided into theoretical and empirical parts. Chapters one and two form the theoretical part, and chapters three, four and five form the empirical part of the thesis. In the end of the thesis there is presented discussion and conclusions which summarizes the study. The figure 2. illustrates the structure of the thesis and describes the main areas in certain chapter.

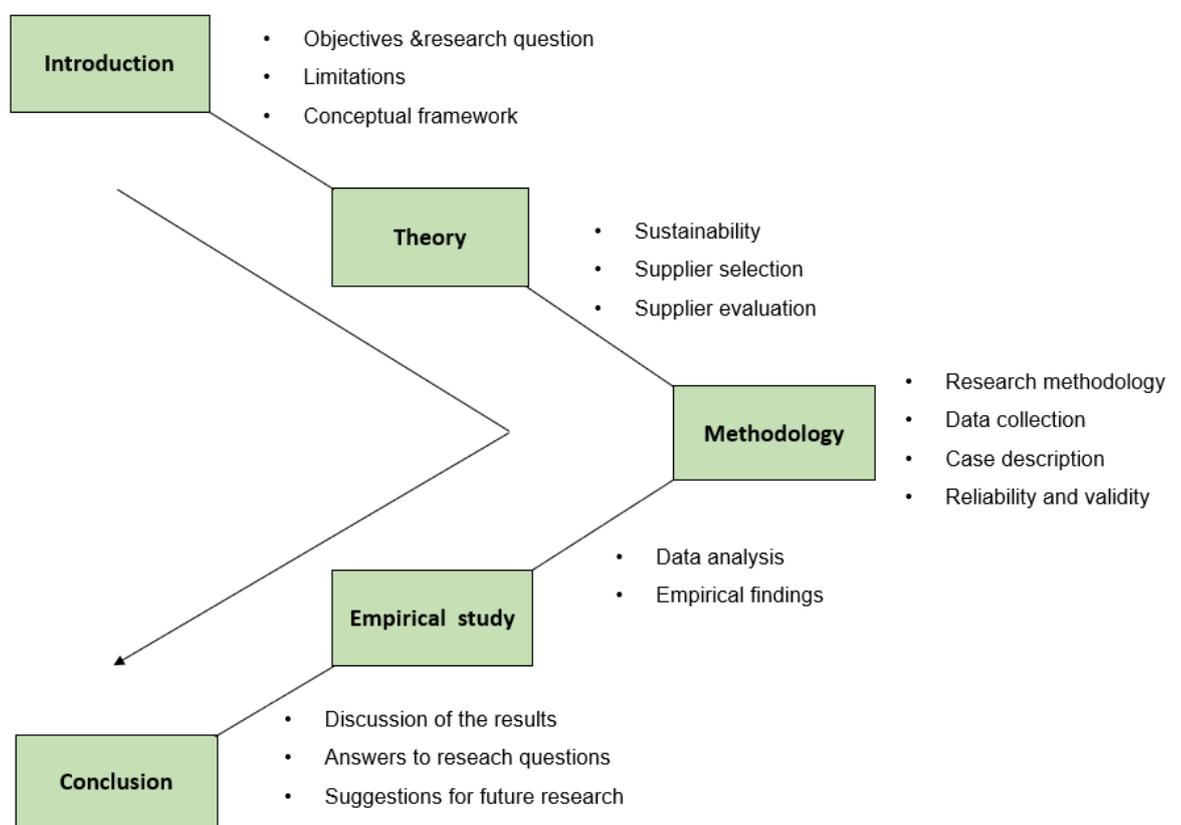


Figure 2. Structure of the thesis

The opening chapter includes the introduction of the thesis topic, and it introduces the thesis's objectives and research questions. Limitations and the research methodology are also discussed in the opening chapter. Moreover, the theoretical framework is presented in the introduction chapter. After the introduction chapter there is literature review and theory part focus on the supplier selection process and sustainability. These chapters present the

most essential concepts and theories for the thesis. The first theory chapter introduces the concept of sustainability and the basic principles of the triple bottom line. Next, the theory introduces an encompassing description of the supplier selection process. Furthermore, theory deepens to the traditional supplier selection criteria and the criteria forming process. The following large theory theme focuses on the supplier evaluation and monitoring practices. It also introduces different ways to classify suppliers.

The third chapter introduces the methodology of the research. The chapter focuses on presenting qualitative research methods and explaining how those work. In addition, it introduces the principles of the case study, and it presents how empirical data was gathered. In this chapter the case companies are also illustrated and described. The fourth chapter includes the empirical part of the research, and it includes data description. This is one of the most relevant chapters because it analyses empirical evidence and forms findings of the study. In other words, this chapter combines findings after the analysis and explains the results. The fifth chapter is about discussion and conclusions. In the discussion chapter there is the reflection of the theory to the real-life empirical evidence which gives results for the study. This chapter summarizes the most relevant findings by answering the research questions. All in all, the final chapter presents the findings of this study and discusses the future research topics.

2. Sustainable supplier selection and evaluation

The organization's operations have expanded worldwide, and they collaborate with multiple suppliers. The turning point in the collaboration is that companies are also responsible for their partners' actions. It is not enough that the organization itself acts in a sustainable way. However, they should ensure their whole supply chain acts in a responsible way. (Zhu, Sarkis & Lai, 2008) Furthermore, there are many sustainability risks with suppliers and to avoid those risks organizations are motivated to seek truly sustainable suppliers. For instance, organizations might lose their reputation if their suppliers have poor sustainable practices. In addition, organizations might face financial losses if their products do not follow environmental standards. There might occur a risk of delays if the supplier faces an environmental problem with its operations. (Cousins, Lamming & Bowen, 2004) Hence, there are several risks with suppliers which can be avoided by selection and evaluation of sustainable suppliers. However, the challenge is to find a reliable approach for supplier assessment and pay attention to economic aspects but also consider social issues and environmental conditions. (Laosirihongthong; Samaranayake & Nagalingam, 2019).

2.1 Sustainability

Sustainability has become a crucial phenomenon in the business world. It has gained a lot of attention in organizations. Sustainability refers to use of renewable resources which ensures resources for the future generations. In other words, sustainability is a development which ensures that the resources do not diminish. (Moldan, Janoušková & Hák, 2011) The idea of sustainability is to realize that current actions have impacts which occur in the future. Therefore, the basic principle of sustainability is equity. (Elliot, 2005) In practice, the concept of sustainability suggests that there are limits for people's consumption of nonrenewable resources (Portney, 2015, 88). Sustainable business can be defined as an action which ensures long-term health of the current and future stakeholders by paying attention to economic, social, and environmental aspects. (Jimenez, Franco, & Smith, 2021)

There are a few key features of sustainability. The first one is that sustainability is seen as a global responsibility. The sustainability issues concern everyone in the world because consequences are global. The second feature refers to long-term thinking. Sustainability strives to mind future generations. Moreover, sustainability recognizes the limits of growth or at least redirect growth in non-harmful ways for the environment. It is significant to consider what are the consequences of growing consumption and how consumption can be sustainable. The final feature of sustainability considers social equity. (Rogers & Hudson, 2011) The equity of sustainability aims to share environmental impacts and natural resources which lead to more equal wealth. (Portney, 2015,194) According to Lorek & Spangenberg (2013), an economy is sustainable by paying attention to human needs, including needs of the world's poor, and it accepts the limitations of resources in the sustainable environment which is capable of meeting current and future needs. The basic principle of sustainability is to redesign the economic systems to avoid causing harmful impacts for nature in the long-term (Dobbelt & McDonough, 2010, 71).

Sustainability affects every actor in society: the private sector, government, and non-profit actors. They have all adopted different versions of sustainability because they have different motives. (Portney, 2015, 193) According to Lieb & Lieb's research (2010), the most significant reason for establishing a sustainability program was an organization's desire to do the right thing. The other reason which had a high importance was the customer's pressure. The survey reveals the third reason for companies' sustainability programs to be a desire to improve corporations' reputation. Green customers and competitiveness were also identified as reasons for sustainability programs in the survey. Consequently, many companies want to enhance their brand image and reputation. In other words, they want to be seen as responsible actors in society. According to Accenture's survey, 80% of 766 Chief Executive Officers think that they could achieve competitive advantage by integrating sustainability into corporate strategy. (Longoni, 2014, 6) According to Bansal & Roth (2000), there are four major motives for organizations targeting sustainability. The first motivation is legislation. Legal costs and penalties ensure that organizations follow the legislation. Secondly, the shareholders' pressure encourages organizations to be sustainable. Shareholders have power and requirements which affect the organization's actions and decisions. The third motive is economic opportunities. Organizations can achieve cost reduction by monitoring consumptions and avoiding additional costs. For instance, the lower

water consumption and moderate usage of energy are related to lower costs. Moreover, many unnecessary costs can be avoided by collaborating with sustainable suppliers and monitoring them continuously. (Dillon & Griffith, 2001, 174-175) The final driver for sustainability according to Bansal & Roth (2000), is ethical motives. This refers to the same motive as the Lieb & Lieb research (2010) results gave. Organizations want to do the right thing. In conclusion, the organization's motives to be sustainable are considering the ethical, financial motives and shareholders' pressure.

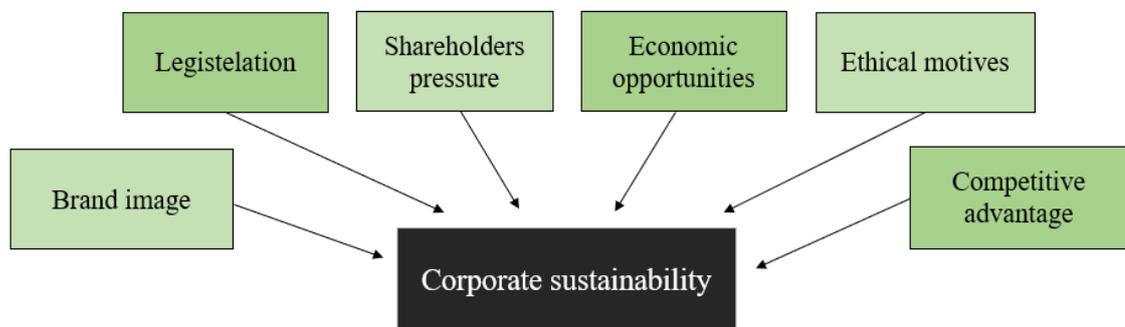


Figure 3. Motives for sustainability. (Bansal & Roth, 2000)

Corporate social responsibility has become a significant phenomenon to ensure sustainable actions. In practice, organizations can report their sustainable practices by following corporate social responsibility principles. According to McKinsey & Company research of corporate executives (2006), organizations implemented CSR mostly because executives believed that shareholders would be content and favour their company. For these reasons CSR is a critical factor to improve competitive advantage and sustainability of the organization. In other words, the business environment encourages companies to implement CSR which helps to do transparent business by protecting the environment and taking care of the well-being of society. There are many different definitions of CSR. According to Kotler & Lee (2004, 3), CSR can be defined as an optional commitment to enhance society's well-being. It includes different business practices and requires support of companies' resources. The main idea of the CSR is that companies pay attention to their actions and focus on stakeholders' interest by taking care of the environmental impact in a responsible way (Barauskaite & Streimikiene, 2021). All in all, CSR can be defined as non-financial responsibilities through voluntary communication and action. (Farache, Grigore, Stancu &

McQueen ,2020,188) CSR has three basic principles. The first principle is accountability. It considers the fact that companies' actions have an impact on the external environment and companies must take responsibility for the consequences. In practice, companies should report their action's impacts to stakeholders. The second basic principle of CSR is transparency. It ensures that companies' actions are clearly reported and essential facts are not concealed within reports. Everything should be apparent if the actions are transparent. The last principle of CSR is sustainability. It considers the effects of companies' actions for the future and ensures that resources are also available in the future. (Jamīlah A., & Crowther D., 2013, 27-30) All in all, CSR practices help organizations to summarize their actions' impacts and ensure that there is enough information available about companies' sustainable operations.

2.1.1 Triple bottom line

According to Kleindorfer, Singhal, & Van Wassenhove (2005), the triple bottom line (TBL) can be used to measure sustainability performance. In other words, it considers impacts on social, economic, and environmental areas (Azevedo & Barros, 2017). On the other hand, it illustrates impacts on people, profit, and planet. Triple bottom line approach forms the framework which measures sustainability of the organization. The term triple bottom line was published during the 1980s by John Elkington (Kannan, 2018). He claimed the organization's triple bottom line encompassed value-adding activities. The focus is not only on economic perspective, but it also pays attention to a social and environmental perspective. (Elkington, 1998) Sustainability consists of three different domains, according to triple bottom line theory. Those are environmental, economic, and social domains. (Granados, & Gámez, 2010) Figure 4 illustrates the triple bottom line of sustainability.

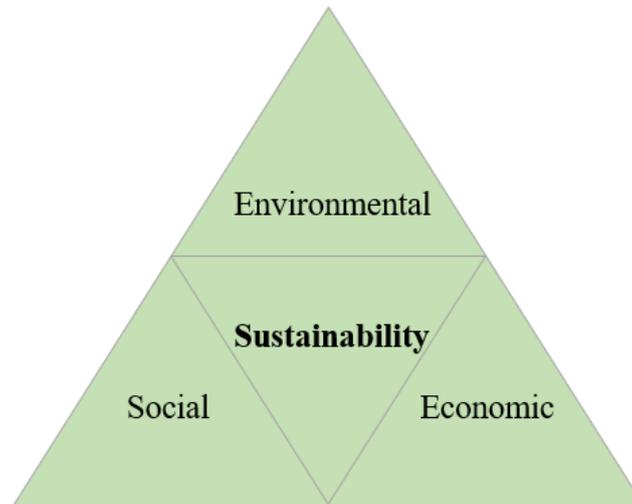


Figure 4. Triple bottom line (Molamohamadi, et. al, 2013)

The economic domain concentrates on the economical part of a business and ensures long-term return for stakeholders and company. (Steurer & Konrad, 2009) The environmental domain of CSR in triple bottom line theory focuses on protecting the natural environment and decreasing pollution and waste (Vachon & Mao, 2008). The social domain of the triple bottom line focuses on enhancing people's health conditions and meeting human needs and legal rights (Kleindorfer et. al., 2005; Molamohamadi, et al., 2013). On the other hand, it aims to minimize social conflicts and confirm equity between employees. Companies can be truly sustainable only if they consider all aspects of the triple bottom line. In other words, companies need to balance social, economic, and environmental goals. Sustainability will not be achieved by prioritizing one area over the others. (Hahn & Figge, 2011)

Environmental factors

Environmental area of the triple bottom line is concentrated on minimizing companies' negative impact on the environment and preventing climate change. In other words, the target is to operate in an eco-friendly way. Environmental sustainability includes the management of resources and energy (Cowan, Dopart, Ferracini, Sahmel, Merryman, Gaffney, & Paustenbach, 2010). It also considers the corporations' footprint. The footprint appears in operations such as the design of products, production, recycling, and transportation. (Kleindorfer et. al., 2005) It is important that companies consider their

actions' effects during the whole life cycle of their products. In practice, in environmental sustainability companies aim to measure, report, and reduce pollution. (Lehto, 2018) For instance, it is significant that companies reduce waste and decrease the consumption of harmful materials (Gurel, Acar, Onden & Gumus, 2015). More deeply, environmental sustainability consists of a few areas which protect nature. Firstly, environmental sustainability focuses on reducing pollution. (Gimenez, Sierra, & Rodon, 2012) For instance, manufacturing creates pollution in air, water, and soil. In addition, manufacturing of the raw materials such as steel requires a lot of energy (Worrell, Price, & Martin, 2001). Consequently, environmentally sustainable actions reduce greenhouse gases and protect vulnerable ozone layers. Secondly, it focuses on monitoring the energy consumption and tries to save use of energy. (Giannakis & Papadopoulos, 2016). Thirdly, considering the products, environmental sustainability aims to reduce waste in the production process and the waste of final products. In addition, it strives to avoid the use of unnecessary packaging. (Giannakis & Papadopoulos, 2016). On the other hand, environmental sustainability products include attributes such as reusability and recyclability (Zhong & Peng, 2015).

In the worst situations neglecting environmental sustainability it might cause enormous destruction (Sutton, 2004). For instance, natural disasters such as hurricanes, floods, earthquakes might occur. In addition, heatwaves and water scarcity can have fateful consequences (Giannakis & Papadopoulos, 2016). Business actions have already led to extreme weather events (Koshy 2019). For example, global warming and rising oceans concerns people. Consequently, the pressure of sustainable operations is high because new environmental challenges are appearing every day. Sustainability is not anymore only a strategic differentiator. It is more like a strategic necessity and assumption. (Ioannou & Serafeim, 2019) However, luckily the technology is advanced and analytical capabilities are becoming more common. (Ramanathan & Ramanathan, 2020, 135). All in all, the major environmental concern has been pollution and the environment itself. (Kumar, Palaniappan, Kannan, Shankar, 2014a). However, environmental sustainability aims to protect ecosystems and natural resources which are vital for people's well-being. (Portney, 2005, 104)

Environmental sustainability practices can be divided into three different categories. The first category is green knowledge transfer and communication. It includes knowledge

sharing of environmental issues and training suppliers to be more environmentally conscious. The second environmental practice category is resource transfer and investment. This practice category includes suppliers' technical support and it provides direct incentives as a reward for desirable environmental behavior. However, the last environmental category management practices incorporate certifications and requirements. In addition, feedback, development, and information sharing are the main roles in environmental practices. (Bai & Sarkis, 2010a) According to Pimenta & Ball (2015), the most common environmental improvement practices include integrated databases and knowledge, training, and technological assistance. These practices help organizations to cope with environmental challenges.

Social factors

Social domain of the triple bottom line focuses on people's health and well-being. In addition, it considers social impacts on society. This area of triple bottom line can be called social sustainability. In other words, the social perspective of sustainability ensures safe working conditions and improves the welfare of employees. (Hug, Chowdhury & Klassen 2016) The social domain of sustainability considers companies' impacts which influence employees and societies (Longoni, 2014, 2) Social sustainability's impacts can be divided to occur both outside a company and inside a company. Impacts on outside the companies include effects of surrounding society and impacts inside the companies maintain the employee's well-being and safe working conditions. (Pagell & Wu, 2009)

There are four main areas in which social sustainability is focusing on. The first one is equity. Social sustainability aims to remove poverty and enhance economic growth which aims to better equity (Ballet, Bazin & Mahieu, 2020). Social sustainability also ensures fair wages (Giannakis & Papadopoulos, 2016). The second main area one is human rights. Social sustainability ensures that there is no discrimination in the working place, and all have same equal rights. For instance, depending on the gender, skin color, religion, or age every employee is treated equally. (Shim, Lee, Moon, & Chung, 2021) Discrimination might appear as a hate speech, sexual harassment, verbal abuse, and insolent telephone calls. (Jay, 2010) The third main area is quality of life. This area focusses on preventing unethical treatment and the removing the use of child labor or forced labor. (Kumar et al. 2014a) The

last main area is working conditions. Social sustainability ensures that the working environment is safe, and employees stay healthy. The labor conditions should have good hygiene (Yawa, 2014,14). It is also important that the working hours are moderate, and employees have a balance between their private life and work. (Giannakis & Papadopoulos, 2016) Work shift is extended when shifts are longer than 8 hours. However, over 40 hours per week is considered overtime. (Caruso, Hitchcock, Dick, Russo & Schmit, 2004, 1)

The major concerns of the social sustainability are human rights which include child labor and too long working hours. (Kumar et al., 2014) If companies do not take care of social sustainability, they might face adverse consequences. In the worst-case scenario neglected social sustainability can lead to a loss of life if working conditions are so harmful. In addition, situations when supplier uses child labor can also affect company's own reputation. (Hug, et. al. 2016) However, buyers can support suppliers with their social sustainability and prevent harmful social consequences. There are different practices which organizations can utilize to ensure social sustainability. The first category is social responsibility knowledge sharing. It ensures that suppliers have enough information about social sustainability issues and how to avoid them. The second practice category is socially responsible supplier evaluation. It incorporates monitoring suppliers' social issues and developing improvement ideas. The last practice category implies socially responsible supplier development. It focuses on developing suppliers' social sustainability performance. (Lu, Lee & Cheng, 2012)

All in all, social sustainability pays attention to human needs. It pays attention to legal and moral rights. (Molamohamadi, et. al, 2013) The main goal of social responsibility is to deter unethical action.

Economic factors

Economic domain of the triple bottom line focuses on increasing the economic benefits for society. Economic sustainability aims to enhance social welfare by ensuring adequate economic performance. The idea of economic sustainability is that companies do not only focus on increasing their own economic performance but also share wealth with society. (Shim, Lee. Moon, & Chung, 2021) In other words, the economical perspective of

sustainability ensures the economic success of the organizations and their stakeholders. It aims to gain high income by increasing income flow and decreasing the amount of capital. (Molamohamadi, et. al ,2013) In the economic aspect the main goal has been economic growth at least during the last five decades. Hence, sustainability has got less attention and the balance between sustainability and economic growth has been challenging. (Moldan et. al, 2012)

The financial basis and profit are vital for the existence of organizations. (Agnieszka, 2018) Without the capital there are no organizations. Furthermore, it is crucial that organizations develop a business strategy which aims to maximize profit. By doing so they can take care of the economic responsibilities. (Jintao, Licheng, Chong, Rong, Ahmed, Raheem &, Justas, 2020) Profits are important for owners and investors but also necessary for growth opportunities (Carroll, 2016). In other words, without profits organizations will not survive. (Agnieszka, 2018) Furthermore, economic sustainability forms the basis of the other dimensions of sustainability (Carroll, 1979). Without the financial basis there is no organization and therefore no sustainable actions. It is significant that organizations have a stable financial basis and continuous cash flow.

Organizations have legal responsibilities such as paying tax and paying customs. Economic sustainability decreases the evasion of taxes, and it aims to prevent price fixing. (Giannakis & Papadopoulos, 2016) However, some organizations try to avoid taxes or use tax planning. Consequently, it is one of the economical sustainability issues. (Kosonen, 2013). A few significant economic responsibilities are to prevent bribery, corruption, and dishonesty between companies. (Giannakis & Papadopoulos, 2016) Corruption leads to unfair competition which has an impact on employees, suppliers, and government. The corruption creates a harmful reputation for the organizations, and it constrains economic growth. (Wang & Wang, 2017) Corruption also leads to a loss of public trust for the government. Consequently, it might lead to a lack of safety and increasing crimes. In addition, corruption might lead to extra costs for the public sector. (Hills, Fiske & Mahmud., 2009) In addition, the companies who are economically sustainable also act against cartels and keep the competition fair (Giannakis & Papadopoulos, 2016).

There are different practices which help organizations to ensure economic responsibility. According to Belotti, Tate, Silva, Carpinetti & Luiz (2021), the most general economic sustainability practices incorporate managing buyer-supplier relationship, assessment and feedback for suppliers, supplier training, effective sharing of information and direct incentives. It is easier to give feedback for suppliers if buyers have managed their relationship. Moreover, if the buyer-supplier relationship is close and they trust each other, it is easier to share information and knowledge which helps to develop suppliers' actions. All in all, it is crucial to notice economic issues and avoid them because economic sustainability forms the basis of other dimensions of sustainability.

Table 1. Sustainability issues and practices

Sustainability issues & practices		
Environmental	Social	Economic
<p>Issues</p> <ul style="list-style-type: none"> • Pollutions • Global warming • Ozone layer • Natural disasters • Heatwaves • Water scarcity • Rising oceans <p>Protection practices</p> <ul style="list-style-type: none"> • Waste reduction • Recycling • Decrease of energy consumption • Usage of renewable resources 	<p>Issues</p> <ul style="list-style-type: none"> • Unequality • Human rights (Child or forced labor) • Discrimination • Bad quality of life • Harmful labor conditions (Hygiene & extended work shifts) • Lack of safety <p>Protection practices</p> <ul style="list-style-type: none"> • Removing poverty • Enhance of economic growth • Fair wages • Knowledge sharing • Responsible supplier development 	<p>Issues</p> <ul style="list-style-type: none"> • Corruption • Bribery • Dishonesty • Tax avoidance <p>Protection practices</p> <ul style="list-style-type: none"> • Legislation • Regulations • Actions against cartels • Prevention of price fixing

Table 1. summarizes the most essential sustainability issues and practices. There are several practices how companies can protect their sustainability. All in all, sustainability issues create critical problems which have considerable consequences.

2.1.2 Barriers for sustainability

Some organizations do not follow sustainable standards because they might face barriers for sustainable operations. Hence, those organizations do not emphasize sustainability standards in their supply chain. However, the barriers for sustainable supply management differ between industries. Previous literature reveals that researchers have conducted several studies about the sustainability barriers in the supply chain. According to Tumpa, Ali, Rahman, Paul, Chowdhury & Khan's (2019) study, in the textile industry the most critical barriers for sustainability were "low demand of green products due to customers' lack of awareness" and "less incentives from the government". Moreover, the "lack of government regulations and legislative framework" was a critical barrier for sustainability. If we compare to developing countries, they often have legislation to increase the adoption of sustainable actions. However, the other research was about the barriers of sustainability in metal manufacturing. As a result of this research the most critical barriers incorporated lack of resource availability and technology and lack of resources for green projects. In addition, those main barriers included missing communication and lack of top management commitment. (Ruben, Nagapandi & Nachiappan, 2021)

According to Giunipero, Hooker & Denslow (2012), a few issues hinder organizations' capabilities to apply sustainability practices. The first issue is the lack of consensus at the CEO level. Some organizations do not understand what sustainability means. (Bern, Townend, Khayat, Balagopal, Reeves, Hopkins & Kruschwitz, 2009) They do not have the common definition which causes misunderstandings. The perspective of sustainability might also differ because some have too broad, and some have too narrow definitions. (Ruben et al., 2021) The other barrier for sustainability might be costs (Nidumolu, Prahalad, & Rangaswami, 2009). Some organizations might think that sustainability just increases costs. However, in the long-term sustainability might lead to financial benefits. It is true that in the short-term sustainable practices require investments which might increase the costs. Organizations might also have a lack of sustainability standards. (Giunipero, Diane Denslow, 2012) It is important that they have clear regulations of sustainability. According to Bern's et. al. (2009) survey, they found that organizations struggle with the sustainability time horizon. In other words, the misalignment of the strategic goals might occur as a barrier

for sustainability. In practice, it is not an easy task to evaluate the cost and benefits of sustainable practices in the long term.

2.2 Supplier selection

Supplier selection process is critical for manufacturing companies' success. According to Shpend, et al. (2015), the supplier selection process is one of the major issues in the organizations. However, the selection of global suppliers is difficult because of the vague preferences and incomplete information (Ghodsypour & O'Brien, 1998). It is very complicated, and it includes risks. (Chan, Kumar, Tiwari, Lau, Choy, 2008). In some cases, raw materials, and component parts form 70% of the product's cost. It means that selection of suppliers has a crucial role in cost reduction (Ghodsypour & O'Brien, 1998). In other words, organizations have made traditionally sourcing decisions aiming to cut costs. However, nowadays there is more and more sustainable legislation. (Seuring & Müller, 2008) The supplier selection plays the main role in the sustainable purchasing process. For these reasons, it is a strategic decision which has essential consequences not only for a company but also for the final customer.

Industrial business has long complex buying processes. There are different situations where organizations need to collaborate with suppliers. Organizations might have traditional purchasing situations, or they might outsource their operation to external providers. There have been identified three different buying classes which are new task buying, the straight rebuy and the modified rebuy. (Leonidou, 2005) The new task buying refers to a buying situation in which the product has not been ordered before and the current suppliers of organizations do not supply this product. In other words, the organization must find a new supplier and negotiate a deal in the new task buying. However, the straight rebuy refers to a situation where organizations collaborate with the same supplier and reorder the goods (Domański & Guzek, 1992). This kind of buying situation is familiar for both parties. The third buying situation class is the modified rebuy which refers to a situation where something has changed in the buying process. For example, the quantity of the order or the appearance of the product has changed. (Faris, Robinson & Wind, 1967) Modified rebuy refers also to the situation where the buyer orders the same product from a new supplier (Domański & Guzek, 1992).

Table 2. *Buying situations. (Faris et al, 1967)*

New task situation	Straight rebuy	Modified rebuy
The purchasing situation is new, and product has not been ordered before	Reorder situation	A buying situation where something has changed, for instance quantity or appearance of product
A new supplier and new deal	Collaboration with same supplier than before	Collaboration with same supplier than before or new substitute supplier
No experience and higher uncertainty	Experience and lower uncertainty	Experience and moderate level of uncertainty

2.2.1 Supplier selection process

According to Chan et. al (2008), selection of suppliers is one of the most significant aspects that buyers should pay attention to while forming the strategy. It is crucial because companies are more dependent on their suppliers. Every supplier has a direct effect on the organization and their supply chain's effectiveness. Moreover, supplier selection is a fundamental process because it impacts on competitive strategy. Suppliers have financial consequences for the company and their actions might have an impact on the company's reputation. (Moretto, Patrucco & Harland, 2019). For these reasons the evaluation of the suppliers has become more important. However, the supplier selection process is very complicated because it includes uncertain and uncontrollable factors (Sanayei, Mousavi, Abdi, & Mohaghar, 2008). According to Sarkis & Talluri (2006), the supplier selection process is very significant but also one of the most difficult processes. However, the target of the supplier selection process is to find a suitable supplier who reduces purchasing risk and maximizes the value (Taherdoost & Brard, 2019). Because of the process's complexity, supplier selection requires time, analysis, and deep consideration.

In the first stage of the supplier selection process the aim is to identify a need (Zouggari & Benyoucef, 2012). It is essential that the company clearly identifies what they are looking for and specifies the problem. When the need is clear the process continues by forming specific selection criteria and requirements for the supplier. The formulation of the selection criteria is a very essential part because the criteria will be useful later when companies evaluate and monitor the suppliers. (De Boer, Labro & Morlacchi, 2001) Additionally, it is relevant that the organization defines the buying situation because it affects the supplier selection process (Taherdoost & Brard, 2019). If an organization is going to have a straight rebuy or modified rebuy, they can utilize existing supplier selection criteria and historical data of suppliers. However, if the organization have a new task buying situation, they must spend more time on the supplier selection process. (De Boer, 1998) When the organization's need and buying situation is defined the next step is an evaluation and qualification of candidates. In this stage the buyer compares candidates to the selection criteria and evaluates them deeply. It is essential that companies estimate which of the suppliers has the best capabilities to support the corporate strategy. The final step of the supplier selection process includes final evaluation and selection of the most suitable supplier. (De Boer, et. al, 2001) Supplier monitoring and evaluating is its own process but it follows the supplier selection process.

According to Monczka Handfield, Giunipero, & Patterson (2009, 237), the supplier selection process includes seven steps. Those steps are described more detailed than the previous process description. The first two steps of the process which are identifying a need and the forming of the supplier selection criteria are similar like the De Boer et. al's (2001) process description. However, the third step deepens to determine a sourcing strategy. After that the process proceeds to define a potential supply source. The next step is to eliminate and limit suppliers by utilizing selection criteria. The sixth step is to identify a method of supplier selection. However, the process ends with the selection of a supplier and writing an agreement. (Monczka et. al. 2009, 237)

According to Cousins, Lamming, Lawson (2008, 60), the supplier selection process consists of four stages. The first stage is initial supplier qualification which aims to find a supplier who follows the right standards and has capabilities to support the buyer's targets. In this stage suppliers meet the minimum requirements. Buyer usually considers the supplier's manufacturing capabilities and financial position. The second stage is agreed measurement

criteria which include formulation of essential selection criteria. At this stage it is significant to pay attention to specific attributes which are common for the product which is being purchased. The third stage includes the comparison of suppliers across the selection criteria. This stage is called obtaining relevant information. For instance, buyers can do supplier visits or use supplier performance measures. The last step of the supplier selection process is to make a final selection. (Cousins, et. al., 2008, 61-69) This description of the supplier selection process is like the De Boer's et al. (2001) description. In the following chapters the stages of the supplier selection process are introduced more deeply.

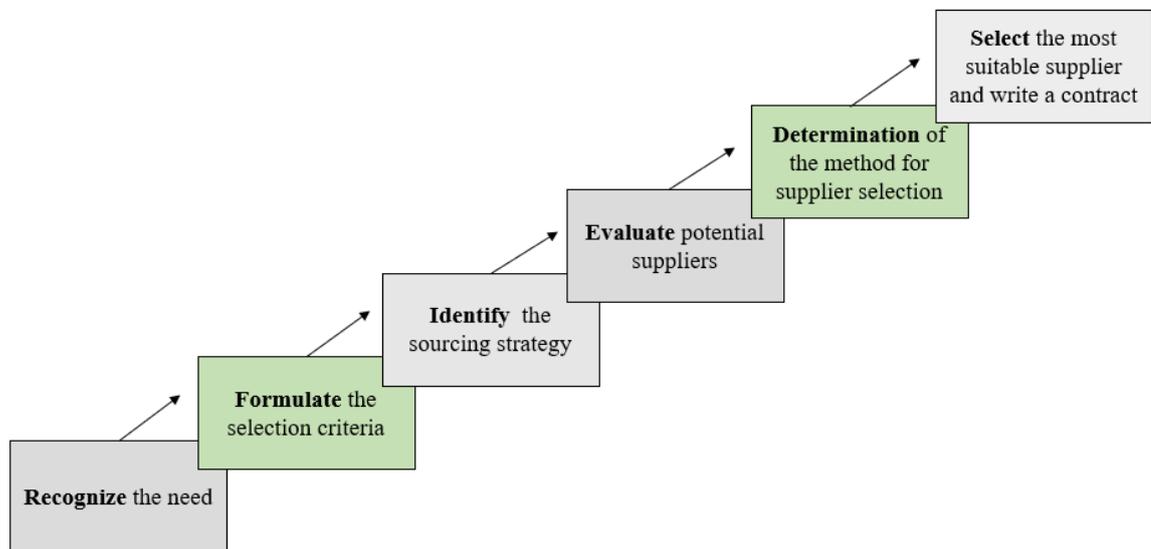


Figure 5. Supplier selection process. (Source modified: Monczka et. al. 2009 & Golińska, 2014)

The first main step of the supplier selection process is to recognize the need (Igarashi, Boer & Michelsen, 2015). The consideration of the need might be anticipating the future's purchasing. For instance, the product development team might give preliminary plans of development of new products. In some cases, this information is enough for the purchasing team, and they can begin to develop the evaluation criteria and justify the need. (Monczka et. al. 2009, 236) However, there are other cases when the purchasing team must identify a need for a supplier. For instance, there might be a need to replace the supplier, or the number of suppliers want to be changed. (De Boer, 1998) Current suppliers might have insufficient

capacity or if they have poor performance. Then there might occur a need for extra or substitute suppliers. In addition, in some cases when there is some change coming for example, at the end of the current supplier's contract or if the organization will buy new equipment. An example of the change which creates a need for new suppliers is the situation when the organization is expanding into new markets. However, the need for new suppliers occurs also in outsourcing analysis situations. (Monczka, et. al. 2009, 238) In other words, it is significant that buyers determine the certain buying need and define the buying situation (De Boer, 1998).

The second main step in the process is to formulation of the selection criteria (Tuzkaya, 2013). Firstly, buyers form the pre-qualification requirements (Weele, 2014, 34). In the pre-qualification buyers choose the most potential suppliers and leave the incapable alternatives away (Mendoza & Ventura, 2008). In other words, buyers make the first decision in the pre-qualification step. It is crucial to justify requirements for suppliers (Igarashi, et al. 2015). However, in this second stage it is important to understand that the selection requirements depend on the items or services. It means that the selection criteria are not the same in every situation. (Monczka, et. al. 2009, 237) However, there might be similar requirements between different purchases, but the main idea is to consider requirements on products and buying situations (Taherdoost & Brard, 2019). The selection criteria might focus on factors such as the cost, location of supplier, quality, quantity, and delivery times. (Cousins, et. al., 2008, 65-67)

The selection criteria forming process includes also identifying a sourcing strategy. Purchasers must decide whether they are going to use single or multiple sourcing. The first one refers to collaboration with one supplier who satisfies organizations needs and in the second option organizations collaborates with several suppliers. (Golińska, 2014, 88) They must also plan the length of the supplier contract by considering short-term or long-term contracts. However, the length of the contract depends on the need for the supplier. In sourcing strategy purchasers must decide whether they are going to focus on domestic or foreign suppliers. In addition, it is important to plan the form of the supplier relationship. They might expect to collaborate in a close working relationship or on the contrary in an arm's-length working relationship. (Monczka, et. al. 2009, 238) Furthermore, purchasers must decide on what the strategy is focusing on and what are the goals. For instance, purchasing strategy can aim at achieving low costs or differentiate from competitors.

Moreover, purchasing strategy can aim for growth of organization or the focus might be on the new innovations. (Chen, 2011) All in all, there are many things that purchasers must determine about the sourcing strategy.

The following step is to evaluate potential suppliers. It includes determining potential supply sources. Purchasers need a lot of information about potential suppliers that they can evaluate them. In this stage purchasers compare suppliers' attributes to the selection criteria. However, the effort in this process step depends on the capabilities of the current suppliers and the strategic importance of new requirements. (Monczka, et. al. 2009, 239) Buyers can evaluate suppliers by scoring and ranking them (Tuzkaya, 2013). It is common that buyers require suppliers to give information about their products and services which helps ranking (Beil, 2010). The search should be more intensive if the organization has a low capability with current suppliers and the requirements are evaluated very important. Nevertheless, if an organization has high capability of their current suppliers or the strategic importance is not so high for new suppliers then the search has not to be so intensive. (Monczka, et. al. 2009, 239)

The following steps include determining the method of supplier selection and evaluation. After the purchasing team has separated potential and incapable suppliers it is time to select the method to differentiate equal supplier candidates. This process step includes deep evaluation of the supplier's information. (Monczka, et. al. 2009, 245) Buyers can utilize different qualitative and quantitative methods in supplier comparison (Cousins, et. al., 2008, 68-72). For example, if buyers have weighed the selection criteria, they can choose a method and calculate the overall scores (Tuzkaya, 2013). In addition, purchasers can utilize supplier visits or preferred supplier lists (Monczka, et. al. 2009, 245). During the supplier visits buyers can evaluate the different areas of supplier's operations and write reports. For example, suppliers can show the level of technological development and the usage of capacity. Buyers can also share information with suppliers during the visits. Consequently, they can achieve a better understanding of each other. (Cousins, et. al., 2008, 68) All in all, supplier visit reports help in choosing suppliers. (Pimenta & Ball, 2015).

After the evaluations have been made buyers select the suppliers (Kumar, Hong & Haggerty, 2011). In other words, the final step of the process is the selection of suppliers and writing a contract agreement (Monczka, et. al. 2009, 247). The final selection decision is made by

assessing a few qualified suppliers (Igarashi, et al. 2015). The buyer finishes the supplier selection process by writing a contract with one or more suppliers. The contract includes the information what suppliers are expected to do and how they will get paid. (Beil, 2010). This process step might include complex negotiations if there is need for specific details in the contract. However, this process step might be simple and requires only a basic contract without specific negotiations. (Monczka, et. al. 2009, 247) It is important that the purchaser finds a supplier who corresponds to the requirements and who maximises the organizations profit without a huge amount of risk.

2.3 Supplier selection criteria

Forming a supplier evaluation framework begins with the analysis of organizations strategy and the key success factors. When the organization's business strategy is clear they can identify different supplier selection criteria. The theoretical foundation of the forming supplier selection criteria might be based on the resource-based view or transaction-cost economics. (Baskaran, Nachiappan & Rahman, 2011) In other words, the supplier selection target could focus on profit maximization or having strategic resources. Traditional supplier selection criteria can be categorized as an “organization factor “and “competition factor”. The organizational factors incorporate supplier’s technical capabilities and organization’s management. The competition factors include criteria such as price, delivery time and quality. (Chen, 2011) Furthermore, the supplier selection criteria can be categorized in quantitative and qualitative forms. (Chan, 2003) Costs are an example of quantitative criteria. However, quality is a qualitative criterion. It is important to balance the weights of qualitative and quantitative criteria. Those are not always clear and consistent. For instance, the suppliers might have low costs, but the quality of product is not high, or the other example is that suppliers might have higher quality but also problems with delivery times (Wind & Robinson, 1968).

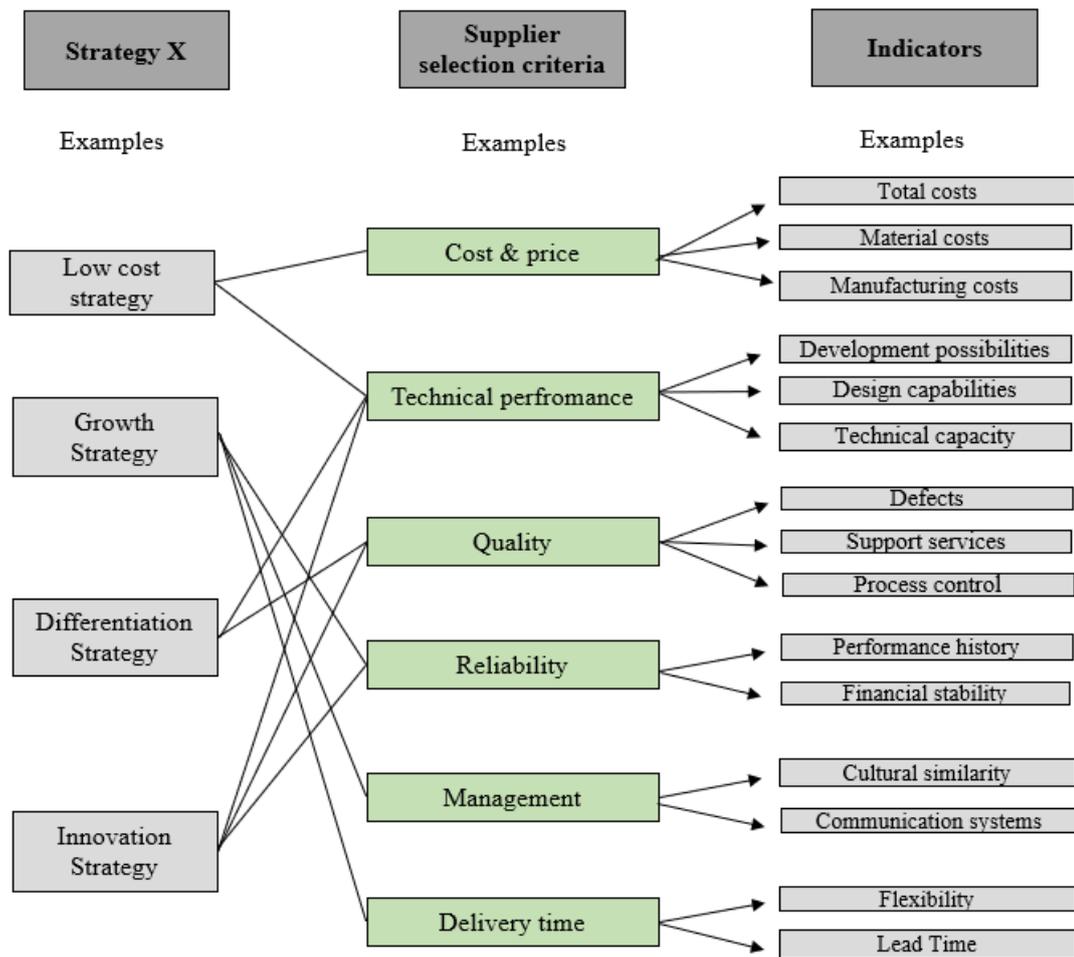


Figure 6. Formulation of supplier selection criteria (Modified from Chen, 2011)

When the strategy and supplier selection criteria are consistent the process continues to divide selection criteria into supplier selection indicators. There are a few indicators in every selection criterion. For instance, quality selection criteria might include return rate, defects rate and discount rate as indicators. (Chen, 2011)

2.3.1. Traditional selection criteria

Price and cost are one of the most common supplier selection criteria (Dickson, 1966). Purchasers' considers the net prices of suppliers. However, there are many cost types which purchasers have to understand. For instance, they must be able to evaluate operating costs

and maintenance costs. (Sen & Sen, 2008) In addition, total costs are significant in evaluating the suppliers. Total cost incorporates material costs, manufacturing costs, and overhead costs. In addition, total costs include direct and indirect labour costs. It is crucial to have enough knowledge and understanding of supplier cost structure because it determines how effective a supplier is. It might be risky if the supplier is unable to give estimates of costs. Some suppliers can see cost inquiries as a threat for them. Nevertheless, suppliers often provide pricing models for purchasers. (Monczka, et. al. 2009, 250) Furthermore, there are many issues which impact on suppliers' own costs. For example, foreign exchange rates and export taxes impact on the costs and price of suppliers. (Sen & Sen, 2008) All in all, costs are one of the most significant supplier selection criteria (Gurel, et. al., 2015).

Quality as a criterion of the supplier selection consists of considering the defects and quality of suppliers 'support services. Quality also identifies suppliers' ability to pack and the usage of resources. (Sen & Sen, 2008) Furthermore, it scrutinises supplier's quality systems and statistical process control. (Monczka, et. al. 2009, 251) According to Kumar & Ashis' research (2014b), the most important supplier selection criteria was product's quality and delivery compliance. Quality evaluation can include a few main areas such as evaluation of suppliers 'management, facilities, and safety. (Monczka, et. al. 2009, 250)

Technical performance includes suppliers' technical capacity and future's technology development possibilities. (Sen & Sen, 2008) The purchasing evaluation team usually has a member who has a technical background. It is important that the evaluation of supplier's technical capabilities focus on the current stage but also the future possibilities. It requires suppliers to share information about their developments and capital equipment plans. (Monczka, et. al. 2009, 251) One evaluation area of the supplier's technical capabilities is design's capability (Ellram, 1990). It is essential to find out if suppliers capabilities support the organization's product development activities (Monczka, et. al. 2009, 251).

Reliability includes information of the supplier's financial position and performance history. In addition, reliability of supplier covers supplier's expertise and product range. The process capability and flexibility are also considered in reliability of the supplier. (Sen & Sen, 2008) The financial position is a significant evaluation criterion for many organizations because a supplier's unstable financial position is a huge risk. In other words, the supplier's economic performance is a fundamental criterion (Ellram, 1990). In many cases, the first thing that

purchasers evaluate is financial stability. If the supplier's financial position is good, then purchasers can continue to assess more deeply. However, the supplier's unstable financial position might have an impact on the supplier's technical capabilities because they might not have enough resources for developing processes. (Monczka, et. al. 2009, 251)

Management and organization can be also considered as a supplier selection criterion. For instance, cultural similarity such as strategic capability and organizational structure can affect buyers' decisions (Ellram, 1990). Moreover, the supplier's reputation is a crucial factor. On the other hand, the position in the industry might also have an impact on the buyer's decision. The communication systems and desire of business can be a criterion. (Sen & Sen, 2008) Furthermore, the geographical location of the supplier can be a crucial factor. (Golińska, 2014, 86) For instance, the supplier's location effects on the transportation costs. If the supplier locates in foreign country, it might include export taxes and foreign exchange rates can impact the total costs. (Sen & Sen, 2008) The delivery time might also differ because of the location of the supplier.

Responsibility is also identified as an important supplier selection criterion. The most general environmental evaluation criteria are considering ISO 14000 certification, protection of ozone layer, recycling, and toxic waste management. (Monczka, et. al. 2009, 251) However, according to Golińska (2014, 85) the most important environmental supplier selection criteria are green image, environmental competences, performance, design, and improvement costs.

Table. 3 Traditional supplier selection criteria (Sources modified from: Golińska 2014; Monczka, et. al. 2009, & Sen & Sen 2008)

Criteria	Description	Sub-criteria
Costs	Financial aspect of purchasing from suppliers	<ul style="list-style-type: none"> -Net price -Total costs -Operating cost - Indirect costs - Cost reduction capability
Delivery	Supplier's effectiveness to deliver	<ul style="list-style-type: none"> -Delivery times -Flexibility -Order cycle time - Availability of parts
Reliability	Suppliers' performance	<ul style="list-style-type: none"> -Financial position -Performance history -Reputation - Risk perception
Management	Attributes of supplier's management	<ul style="list-style-type: none"> -Organizational culture -Communication systems -Training opportunities - Management capability - Documentation - Domain experience
Technical capacity	Supplier's technical capabilities and resources	<ul style="list-style-type: none"> - Technology development possibilities -Design capabilities -Process improvement -Supplier expertise - Innovation
Quality	Supplier's expertise and effectiveness to manufacture	<ul style="list-style-type: none"> -Defects -Quality of support services -Quality of packages -Quality systems -Repair service -Product range - Safety adherence
Geographical location	The location of the supplier	<ul style="list-style-type: none"> -Export taxes -Exchange rates -Delivery time - Trade tariffs -Transportation costs
Responsibility	Supplier's knowledge of responsibility and sustainable practices	<ul style="list-style-type: none"> -Environmental aspect -Social aspect -Economic aspect - Certification and standards

All in all, the most common economic supplier selection criteria include price, delivery time, service, and quality. However, the most common environmental sustainability selection criteria are focusing on nature protection, pollution limitations, green products and image, green innovation, sustainable performance, and management of risky substances which are introduced later in this thesis. (Ghadimi et. al., 2017)

2.3.2 Sustainable supplier selection criteria

Sustainability has become a new necessity and it has changed the supplier selection criteria grounds. CSR related criteria has raised attention and became very significant. (Baskaran et al., 2011) The raising awareness of environmental issues has increased pressure to seek green suppliers (Humphreys, Wong, & Chan, 2003). Traditional supplier selection criteria emphasize economic criteria such as costs, quality, and delivery times (Shpend, Shahzad, Takala, Liu, Sillanpää, & Ali, 2015). However, the increasing concern of the environment has grown the organization's interest in environmental performance. Consequently, green supplier selection has become more common.

Organizations can achieve financial benefits and increase their sustainable performance when they apply green ideas. As a result, economical selection criteria have got alongside environmental aspects. (Liu & You, 2021, 31) However, the green selection criteria cover only environmental and economical perspectives. In other words, it does not include social aspects which are included in the sustainability concept. According to (Zhou & Zhiduan, 2018), green suppliers aim to increase the economic and environmental benefits. However, the sustainable suppliers aim to increase the social, economic, and environmental benefits. In other words, truly sustainable suppliers consider the whole triple bottom line in their actions. Consequently, sustainable supplier is a broader definition. So called “green supplier selection criteria” aim to find suppliers who can consider economic criteria such as high quality and moderate costs but also have a good environmental performance (Liu & You, 2021,9). In other words, if an organization is seeking truly sustainable suppliers, they should ensure that suppliers pay attention to the whole triple bottom line perspective. Hence, it is essential that organizations consider all perspectives of the triple bottom line in formulation of supplier selection criteria. The following section begins with a presentation of common

environmental criteria. After that the section deepens to consider social selection criteria and lastly it introduces a few economic selection criteria.

Organizations and industries have different requirements which affect the green selection criteria (Kannan, Jabbour, & Jabbour, 2014). The challenge for buyers is to incorporate the green selection criteria to the traditional selection criteria. (Liu & You, 2021,9) The one approach is to separate the supplier selection process into two different stages. Firstly, purchasers can utilize the environmental selection criteria as a primary requirement. Secondly, they can evaluate potential suppliers with traditional supplier selection criteria. (Chen, 2005) Anyhow, the green supplier selection criteria include the environmental aspect which evaluates suppliers' actions such as knowledge of sustainability, energy consumption and recycling. The evaluation of suppliers is based on the estimated weights of these criteria. Finally, the supplier candidates are evaluated and ranked by the most important attributes. (Amindoust, et al., 2012)

The previous literature has proposed different environmental supplier selection criteria. According to Lee, Kang, He-Yau, Chang-Fu & Hsiao-Chu (2009) & Tuzkaya (2013), the most general environmental supplier selection criteria include green product and image, green capabilities and design, environment protection, environmental performance, green innovation, and emission control. Green image of suppliers measures the supplier's reputation as an environmentally responsible actor. Green image also compares suppliers market shares and customer relationships. Green capabilities as supplier selection criteria pay attention to supplier capabilities to operate in environmentally responsible ways. It measures suppliers' capabilities to operate by reducing environmental impact. For instance, suppliers can use environmentally friendly packaging or recycling materials. (Lee, et. al., 2009) Environmentally friendly materials decrease the pollution levels and protect nature (Gurel et. al., 2015). Green design is another environmental supplier selection criteria. It measures suppliers' competencies to design environmentally friendly products. Therefore, it incorporates recycling, reuse, and reproduction opportunities. Briefly, green design focuses on the supplier's products and how those could be more eco-friendly. Supplier selection criteria might measure how intensively suppliers commit with environmental policies. This criterion is called environmental performance. Accordingly, it incorporates environmental protection initiatives, regulations, and certifications. Besides, environmental performance measures the level of monitoring. (Ghadimi et al., 2016) Next supplier selection criteria are

focused on pollution. Thus, emission control as a supplier selection criterion considers suppliers' pollution levels. It pays attention to harmful gas emission and wastewater. Moreover, emission control focuses on observing resource consumption and carbon footprint. It is relevant that suppliers have collected data of their pollution levels in manufacturing operations. (Ghadimi, 2017)

Next, the social perspective of the triple bottom line is considered. Firstly, health and safety are an important internal social selection criterion (Mani, Agarwala & Sharmaa, 2014). Those measure how safe suppliers' systems are and consider supplier practices to ensure labour's well-being. (Ghadimi et al., 2016) If suppliers follow safety standards and utilize safety practices, they can avoid many work injuries. (Thornton, Chad, Gligor & Brik, 2013) Secondly, employment practices belong to internal social supplier selection criteria. (Govindan Khodaverdi & Jafarian, 2013) This category considers employee's rights such as flexible working hours, work opportunities and employment compensation. It also observes the discrimination at supplier's working conditions. (Bai & Sarkis, 2010b) Thirdly, contractual stakeholders' impact as a supplier selection criteria measures shareholder's commitment to the organization. (Bai & Sarkis, 2010b) Thus, it compares supplier information sharing, procurement standards, consumers' education and stakeholders' commitment. (Ghadimii et al., 2016) However, one of the external social selection criteria is measuring local communities' influence. Factors which influence the local communities are education, service infrastructure, public services, cultural properties and supporting community projects. (Bai & Sarkis, 2010b) Additionally, there are more social supplier selection criteria such as human right fulfilment, underage labour, female labour issues. (Xu, Kumar, Shankar & Kannan & Chen, 2013)

Lastly, the economical dimension of sustainability is considered in this section. The economic perspective in formulation of supplier selection criteria meets organizational legal responsibilities. For example, legal responsibilities of organizations include obligations of paying taxes and customs. (Xu et al., 2013) According to Molamohamadi, et. al. (2013), economic criteria might include factors such as supplier's credit strength, initial price, and financial stability. All in all, there are plenty of sustainable supplier selection criteria which purchasers can combine to common selection criteria. The most general sustainable selection criteria have been summarized into the following table 4.

Table 4. Sustainable selection criteria. (Source modified from: Lee, et. al. 2009, Mani et. al., 2014, Ghadimi et al., 2016, Bai & Sarkis, 2010b, Xu et al., 2013, Molamohamadi, et. al., 2013)

Dimension of triple bottom line	Supplier selection criteria	Description
Environmental	Green image	Reputation, market shares and customer relationships.
Environmental	Green capabilities	Capabilities to operate by reducing environmental impact
Environmental	Green design	Competencies to design environmentally friendly products, recycling, reuse, and reproduction opportunities
Environmental	Environmental performance	Commitment to sustainable operations
Environmental	Emission control	Resource consumption and carbon footprint
Social	Health and safety	Safety practices
Social	Employee's rights	Flexible working hours, work opportunities and employment compensation, discrimination
Social	Contractual stakeholders' impact	Information sharing
Social	Local communities' influence	Education, service infrastructure, public services, cultural properties and supporting community projects
Economic	Legal responsibilities	Taxes and customs
Economic	Financial stability	Credit strength, initial price

All in all, the sustainable criteria and requirements has increased complexity of the supplier's selection process. If we compare table 3 and 4, we can see that the sustainable criteria are very detailed and there have been identified almost the same number of sustainable criteria as traditional selection criteria. Consequently, this shows that the significance of sustainability criteria that has increased and achieved more emphasis.

2.4 Supplier evaluation and monitoring

The supplier evaluation has become even more complicated than before because of the increasing amount of the sustainable selection criteria. (Amindoust et al. ,2012) Supplier evaluation starts when buyers identify dimensions which are in the main role in the evaluation of suppliers. By considering the dimensions buyers can rank suppliers. The most important thing in the supplier evaluation is to identify the trade-offs between the dimensions. The evaluation process is more challenging if there are many evaluation dimensions. However, the dimensions depend on what the buyer appreciates most. (Beil, 2010)

There are different methods on how buyers can evaluate suppliers. One example is linear weighted models which evaluate supplier's performance by weighting every selection criterion. This model calculates the sum of the weighted criteria and in the result of the method buyer can find the most suitable supplier. (Omurca, 2013) Linear weight method is not complicated but the results depend on human judgements (Luo, Wu, Rosenberg, & Barnes, 2009). Total cost method is the other option for supplier evaluation. Total cost method considers indirect costs, and it incorporates complex calculations. There are also many other methods such as linear or multi criteria programming and fuzzy set theory which are used in supplier evaluation. For instance, the fuzzy set method is useful in uncertain and incoherent situations. (Omurca, 2013) Hence, a fuzzy set method's advantage is its capability to consider obscure data. The multicriteria fuzzy supplier selection method rate and rank suppliers with linguistic estimations. In addition, in green supplier selection the fuzzy methods are common. (Banaeian, Mobli, Fahimnia, Nielsen, & Omid, 2018) Moreover, AHP so called analytic hierarchy process is a popular and easy method which considers the multi-criterion with numerical values. It consists of 1 to 9 scales and compares buyer's preferences. However, it is not the right method to consider uncertainty. (Chan et

al., 2008) All in all, there are many different options for the evaluation of suppliers. It is also possible to combine and integrate different methods (Banaeian, et. al., 2018)

2.4.1. Supplier classification

Organizations can utilize different classification methods which helps in the supplier evaluation process. Purchasing portfolios have become dominant. The Kraljic Portfolio Matrix (KPM) is a purchasing tool which helps organizations to reduce supply vulnerability and at the same time increase purchasing power. In other words, it helps to match suppliers' external resources with the internal needs of the purchaser. (Dubois & Pedersen, 2002) The Kraljic Portfolio Matrix helps to visualize and perceive the purchasing strategy. The main idea of the portfolio is that all items are not managed in a similar way. (Gelderman & van Weele, 2002).

The Kraljic Portfolio Matrix consists of two dimensions which are "the risk" and "complexity of the supply market". The dimensions are scaled between the "low" and "high" (Padhi, Wagner, & Aggarwal, 2012). The first-dimension risks of the market can be interpreted by considering the complexity of the market. For instance, there might be some entry barriers or logistical complexity. (Kraljic, 1983, p. 110) The buyer has an advantage if there are many suppliers in the market which they can choose from. On the contrary, the suppliers have an advantage if there are only a few supplier choices in the market. Buyers do not benefit from supplier tendering in this kind of situation. The second dimension "the importance of purchase" or so-called profit impact can be measured by assessing the costs. In this dimension it is important to consider how essential significance an item has for an organization's profit. (Logistiikan maailma, 2021) These dimensions define the most suitable purchasing strategy by minimizing the risk and having the power to enhance the purchasing performance. (Padhi et al., 2012)

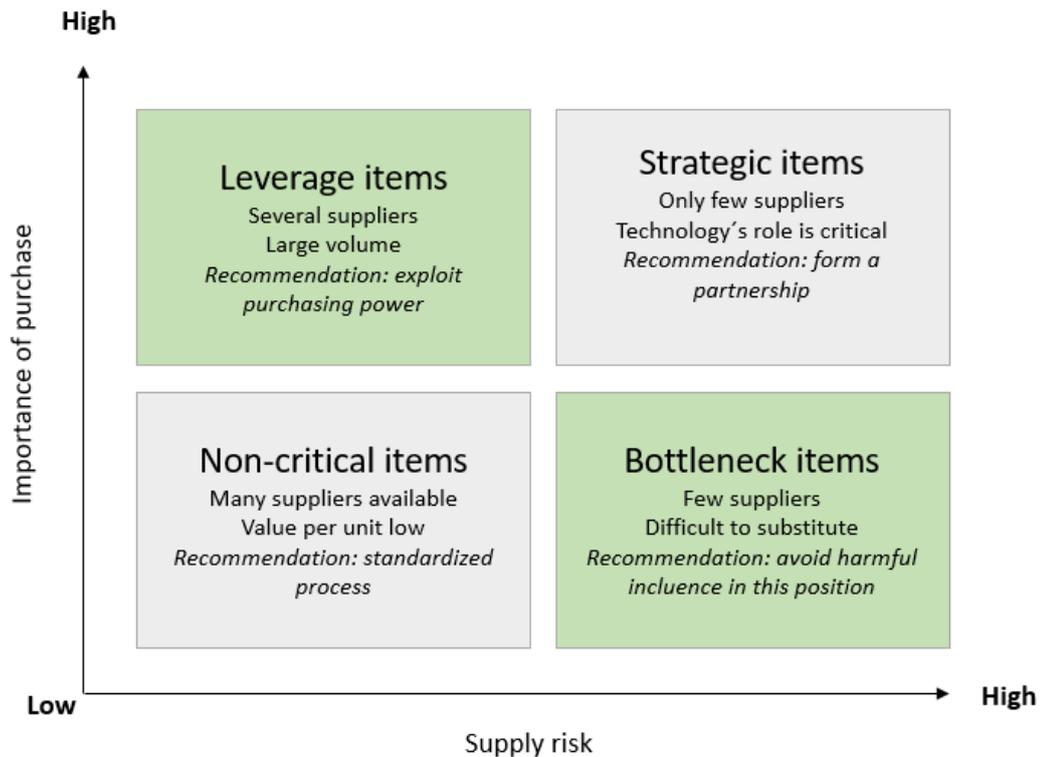


Figure 7. Kraljic Portfolio Matrix. (Adapted from Montgomery, Ogden & Boehmke, 2018)

The portfolio forms four quadrants in which purchases can be categorized. Quadrants are divided to leverage items, strategic items, non-critical items, and bottleneck items. (Torres-Ruiz & Ravindran, 2018) Leverage items have a large purchasing volume and those can be purchased from several suppliers (Canieñls & Gelderman, 2005). Hence, with the leverage items the profit impact is high but the supply risk is low (Gangurde & Chavan, 2016). In this category it is important to assess the unit cost. It is essential to notice that there are substitute products in this category and many equivalent suppliers in the market. (Montgomery et al., 2018) Consequently, buyers have purchasing power and the strategic recommendation for buyers is to exploit the purchasing power. Buyers usually form short term contracts with leverage items suppliers (Torres-Ruiz and Ravindran, 2018). In this product category buyers can require more sustainable behavior because there are many substitute suppliers available in the market.

The next item category is strategic items. Products in this category have some unique specifications. Strategic items bring prominent value for the organizations. (Canie'ls & Gelderman, 2005) Those have a large effect on profit but include also high risk (Gangurde & Chavan, 2016). The example of the strategic item could be a turbine for the chemical industry or engines for automobiles (Canie'ls & Gelderman, 2005). The suppliers' technology plays a critical role with strategic items because there are only a few suppliers in the market. It might be a challenge to substitute strategic items. (Montgomery et al., 2018) However, with strategic items it might be more challenging to require sustainable behavior from suppliers because there are only few candidates in the market. Hence, organizations are recommended to form a partnership with a strategic item supplier (Gelderman & Van Weele, 2003).

The third category is non-critical items which are usually commodities. Those are very easy to find and there are many substitutes in the market. In other words, there are many suppliers available who are providing non-critical items. (Montgomery et al., 2018) However, the value per unit of non-critical items is not high (Canie'ls & Gelderman, 2005). Consequently, the financial impact is low in this product category. (Montgomery et al., 2018). There are rarely technical challenges with non-critical items. The recommendation with non-critical items is to aim for an efficient and standardized process and pool the requirements. (Canie'ls & Gelderman, 2005). According to Gelderman & Weele (2003), the inventories and ordering volumes could be beneficial to standardize. Therefore, buyers have more power to choose their suppliers and require sustainable behavior because they can substitute them quite easily.

The final item category is bottleneck items that have unique requirements. In this category the supplier's assets, technology and expertise are crucial. The bottleneck items are difficult to substitute and measure and the suppliers have power over the buyer. (Montgomery et al., 2018) This item category includes risk which means that an organization should develop backup plans such as security of inventories or supervisions of suppliers. (Gelderman & Van Weele, 2003) However, bottleneck items' influence is low for-profit impact. The recommendation is to approve the supplier's power and avoid the harmful influence of the position. Consequently, availability of bottleneck items could be ensured by assuring them. (Canie'ls & Gelderman, 2005) The relationship form is usually long-term with bottleneck items (Torres-Ruiz & Ravindran, 2018). In terms of sustainability requirements bottleneck

items are challenging because supplier's have more power than buyers (Dabhilkar, Bengtsson, & Lakemond, 2016) All in all, Kraljic portfolio helps organizations to categorize what kind of suppliers they need and what requirements suppliers have. Moreover, it helps to choose the right strategy to collaborate with suppliers.

The other way to categorize suppliers is to consider the relationship and integration levels of buyers and suppliers. According to Şen, Başlıgil Şen & BaraÇlı (2008), supplier integration levels have a relevant impact on both supplier selection process and the formulation of evaluation criteria. Therefore, this is an important categorization method because suppliers have different selection criteria in different levels of buyer and supplier relationships. When the buyer knows what selection criteria is essential in the certain level of the relationship, the supplier evaluation comes easier. In other words, it is relevant to define what kind of relationship is desirable with upcoming suppliers.

According to Ghodsypour & O'Brien (1998), there are five different relationship levels between buyers and suppliers. At the first level of buyer and supplier relationship there is no integration at all. There are no special requirements for suppliers. Consequently, the most essential criteria are quality and price. The form of the relationship is an arm length approach (Watts, Kim & Hah, 1995). The second level of buyer- supplier relationship has a more significant role in buyers 'perspective. The logistical integration between the buyer and supplier creates dependency which means that supplier's logistical performance has consequences on buyers' actions. For this reason, buyers should pay attention to supplier's flexibility, reliability, supply lots and lead time. In other words, supplier selection criteria should focus on the quality, costs, and the operational logistics elements. At the third level of buyer-supplier relationship there is an operational integration. The supplier's process capabilities play an important role at this level. The supplier selection criteria should focus on set up time, lead time and lot size. The quality might be a pivotal factor at this level. (Ghodsypour & O'Brien,1998) At the fourth level of buyer-supplier relationship the integration is high, because the process and the product are integrated with the supplier (Şen , et al., 2008). The selection criteria should consider design involvement, culture, and management ability. The final level of the buyer-supplier relationship is the business partnership. Their actions are integrated, and they work towards the same goals. The

selection criteria such as technological capabilities and human resource management are crucial to consider. (Ghodsypour & O'Brien,1998)

Basis for supplier selection	Product/ Commodity based approach	Capability-based approach
Arm's lenght approach	<ul style="list-style-type: none"> • Short term • Price and quality based • Multiple sourcing • No integration • No special requirements for supplier 	<ul style="list-style-type: none"> • Long- term/ strategic • Capability based • Competitive • Multiple sourcing • Logistical integration
Partner-like approach	<ul style="list-style-type: none"> • Non price based • Operational emphasis • Management assistance • Technical advice • Process and product integrated 	<ul style="list-style-type: none"> • Strategic emphasis • Single sourcing • Continuous improvement • High integration

Figure 8. Buyer and supplier relationship. (Modified from Watts, et. al. 1995: Ghodsypour & O'Brien, 1998)

All in all, the buyer and supplier integration levels have a fundamental effect on the suitable selection criteria. Consequently, it is important for buyers to categorize potential suppliers and consider what kind of relationship they are looking for with suppliers. In conclusion, the supplier selection criteria depend on the supplier relationship and the purchasing strategy. The buyer-supplier relationship affects the sustainability requirements. According to Kumar & Rahman's (2016), they found that it is useful to make sure that suppliers have enough knowledge of sustainability and buyers can even pressure suppliers to commit sustainability practices. Consequently, the pressuring and creation of common sustainability goals is more natural in deeper buyer supplier relationships. Supplier's commitment to sustainable practices might be better in long term relationships.

2.4.2 Supplier monitoring practices

After the collaboration has started with the new supplier it is important for buyers to start to assess suppliers' performance. Supplier evaluations aim to ensure performance objectives and develop supplier's capabilities (Prahinski & Benton, 2004). Nowadays, organizations have given a lot of attention to supplier monitoring systems, because the influence of supplier's performance might have relevant consequences. (Luzzini, Caniato, & Spina, 2014). Supplier performance monitoring and improvement (SPMI) is used to analyze and develop supplier's performance. For example, supplier performance monitoring and improvement aims to mitigate risks, cut hidden costs and continuous improvement of the performance. (Parkash & Kaushik, 2011) According to Dillon & Griffith (2001, 175), there are many connections between cost reductions and environmental monitoring programs. Organizations can avoid hidden costs by monitoring and avoiding damages of suppliers. By following the rules and regulations organization can avoid unnecessary costs. Consequently, sustainable behavior of suppliers brings a strategic value for organization. The figure 9 illustrates the effects of costs and supplier monitoring.



Figure 9. Effects of costs in supplier monitoring (Modified from Dillon & Griffith, 2001, 175)

It is important to give continuous feedback for suppliers that they can develop their operations. Feedback ensures that suppliers have understood the requirements (Prahinski & Benton, 2004). However, the supplier's monitoring might be a complex process if the huge organizations have hundreds of suppliers in their supply chains or even more. The supplier monitoring has two targets. The first aim is to show shareholders how the organization is committed to responsible behavior. Secondly, organizations aim to verify suppliers' sustainable behavior by monitoring and evaluating their actions. It is also relevant to notice that excessive monitoring might negatively affect supplier compliance. In other words, there is a decoupling point in supplier monitoring which should not be grossed. Excessive monitoring might indicate distrust of the monitor and it could lead to non-compliance of the supplier. (Delbufalo, 2018, 24) However, organizations have different methods which support their monitoring in appropriate ways. (Fraser, Schwarzkopf & Müller, 2020 a) For instance, organizations can utilize monitoring practices such as code of conduct, supplier certification, supplier scorecards, supplier self-assessment questionnaires and supplier audits which are presented in the following chapters more deeply.

A code of conduct is quite an easy way to define standards of behavior for suppliers. By using a code of conduct, buyers can set norms which include guidelines for acceptable behavior. In other words, codes include a collection of norms which determine desirable behavior and punishments for unacceptable behavior. (Rahim. 2019, 48) Code of conduct can also be defined as a tool to form an organization's social and environmental objectives and maintain the ethical culture in the organization (Collins, 2004). One example of sustainability code is ISO 26000. ISO 26000 provides guidance for companies on how they can act in a sustainable way. It covers sustainability standards such as human rights, organizational governance, employee practices, environmental issues, fair policies in operations and community development (Rahim. 2019, 52). Moreover, ISO 26000 principles help companies interpret sustainability guidance into a practice. It is compliance with law, and it supports sustainable development by paying attention to stakeholders' expectations. (Pojasek, 2010) By following code of conduct organizations can ensure ethical business practices.

The other option to ensure minimal requirements for suppliers is certification. The supplier certification is possible after the broad investigation of supplier's operations and resources. (Ittner, Larcker, Nagar & Rajan, 1999) The supplier certification helps the buyer to manage and improve the relationship with the supplier. When a supplier is certified it means that suppliers are provided some privileges. For instance, certified suppliers do not need to be inspected every time and they provide materials without routine testing. Nevertheless, certified suppliers have occasional inspections which ensures that they are following standards. In other words, organizations can save time with certified suppliers. In addition, they can more easily develop supplier capabilities and form closer relationships. Supplier certification also provides consistent methods of managing the suppliers. (MBASkool, 2016)

Supplier scorecard is one option for performance evaluation. Supplier scorecard's main purpose is to determine the supplier performance metrics and by using the scorecard organizations can assess suppliers against these key metrics. (Doolen, Traxler & McBride, 2006) By using scorecards buyers can measure suppliers' performance in quality and delivery (Desai, 1996). Suppliers can benefit from scorecards in three different ways. Firstly, suppliers can combine strategic objectives of buyers with internal performance measures. Secondly, they can recognize improvement opportunities which helps to meet buyers' requirements better. Scorecard also helps suppliers to determine what is unacceptable. Furthermore, organizations can benefit from a supplier scorecard program that accurately assess supplier performance. A properly implemented supplier scorecard can be a valuable tool for organization. (Doolen, Traxler & McBride, 2006)

The supplier self-assessment questionnaires analyze in practice suppliers' actions by verifying codes and standards of acceptable behavior. The results of supplier self-assessment questionnaires are based on self-reported estimation of supplier's actions. (s (Thorlaksona, Zegherb, & Lambin, 2017) According to Fraser Müller & Schwarzkopf's (2020b) study, the supplier self-assessment questionnaires' results are dependent on the questionnaire's design and the process. Their research claims that supplier assessment fatigue and a supplier's social desirability bias can influence the responses. They also argue that standardized questionnaire processes decrease the charge of suppliers. Moreover, standardized questionnaire processes increase the chance of precise results because the

supplier predicts responses' importance. In other words, the design of the questionnaire can affect the reliability of the self-assessment results.

The other option is to use a third-party monitor which usually increases the transparency of information. Some organizations might think that third-party monitoring is more reliable. (Delbufalo, 2018, 24) Suppliers audits are one common opportunity to monitor suppliers. Typically, supplier audits incorporate evaluation questionnaires and site inspections. (Gonzalez-Padron, 2016) Audits are often executed by third parties (Thorlaksona et al. 2017) According to ICC (1991), audit is defined as a management tool which assess and document organization's performance to protect the environment. In audits buyers can evaluate for example suppliers' operations in supplier's design, manufacturing, purchasing, or packing departments. Auditors can follow the ISO 9000 series of standards in evaluation of suppliers. The audition process starts usually with inspection of the supplier's quality management system. After that, the auditor monitors the supplier's ordering process and checks that they follow the requirements of ISO 9000. It is important that everything is documented. Finally, auditors can provide some development and improvement ideas for the supplier's senior management. Lastly, the auditor can give a report to supplier management which includes improvement suggestions. (Saunders, 1994)

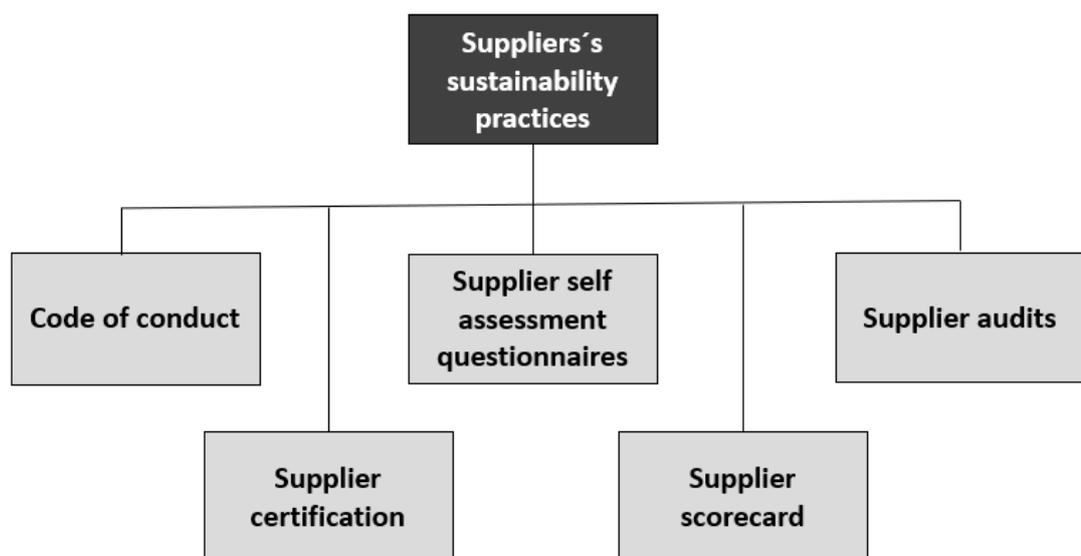


Figure 10. Monitoring practices

There are also more specific methods and supporting analysis which helps organizations to evaluate suppliers. For instance, a certain sustainability criteria tool is a checklist which is used for a specific purpose. For instance, a checklist might assess design by paying attention to various aspects. However, environmental risk assessment (ERA) evaluates the damages that might occur in the operations and assesses the environmental impact. The economical tool is cost-benefit analysis which pays attention to the time horizon of effects. It analyzes the costs and benefits and supports decision making. (Dillon & Griffith, 2001, 181)

3. Research design and methods

After the theoretical description of sustainable purchasing the study deepens to focus on the empirical part. The purpose of the empirical part is to provide a deep understanding in practice of sustainability's role. Rather, the role of the case companies' supplier selection and evaluation processes. The following chapter gives background before the empirical findings and implications. This chapter introduces the research methodology and describes how the research data was collected. Moreover, the reliability and validity are discussed in this chapter.

3.1 Research methodology

This study was conducted as a qualitative research method. It is an eclectic and comprehensive method rather than linear and algorithmic. (Saldaña, 2011, 30) Qualitative research describes the presence of some phenomenon or some issue (Jerome, 1986). The qualitative research method is identified to be subjective, and it is based on interpretations (Klenke, Martin, & Wallace, 2016, 9). However, qualitative research data is nonquantitative which means that the data consist of textual materials such as documents and interview notes (Saldaña, 2011, 3). For these reasons, the qualitative research method is more suitable for this thesis's research topic. In other words, the descriptive method is more proper to explain the role of sustainability than numerical data. By interpreting the data qualitative research gives real life examples of the sustainability's role. Therefore, in this thesis the qualitative research method supports the understanding of the sustainability's role in the supplier selection and evaluation processes.

Case study is suggested to be a common research method in the field of supply management (Seuring, 2008). The case method explains, describes, and predicts processes of certain phenomena at different levels. (Woodside & Wilson, 2003) Common feature for the case studies is to focus on a single event or group (Saldaña, 2011, 8). Hence, this study is conducted as a multiple case study. In multiple case studies it is crucial that cases have the common feature or circumstances which will be analyzed (Klenke, 2016, 69). According to Stuart, McCutcheon, Handfield, McLachlin & Samson (2002), the case study process consists of five different stages. The first step is to formulate research questions. The purpose

of the research question is to test existing theories but also create a new theory (Voss, Tsiriktsis & Frohlich, 2002). After deciding the research questions a research instrument must be identified. Next step is to gather research data. The common data of case research is gathered by interviewing someone. (Stuart et al., 2002) It is relevant to define how many case companies and cases should be involved in the study and what is the time frame of the interviews (Kähkönen, 2011). According to Yin (2003), it is possible to increase the reliability and validity by choosing multiple cases which increase the amount of the evidence. The following step is to analyze data and find implications. Lastly, the research result will be published. (Stuart et al., 2002) All in all, it is important that the theoretical target of the study is clear (Seuring, 2008).

The multiple case study approaches were selected in this thesis because of the research topic. In other words, the investigation of sustainability's role cannot rely on one case company. Hence, it was clear that the thesis topic requires examining many different cases which allows comparison and implications of the general role of sustainability. According to Kähkönen (2011) study, the case study allows a collection of diversity data which support the deep understanding of the research topic. Consequently, a qualitative research method and multiple case study approach were chosen for this thesis's methods.

3.1.1 Data collection

The primary data for the empirical part of the research were gathered from the interviews. The data collection was conducted as semi-structured interviews of the personnel from 4 different companies. However, the secondary data of the empirical part was gathered from case companies' reports and websites to support the primary data. Nevertheless, the data of the empirical part is mainly focused on primary data. The semi-structured interviews focus on the certain theme which has been chosen beforehand. Those include theoretical and open questions aiming to reveal interviewee's experiences (Galletta & Cross, 2013, 45). The semi-structured interview does not include the certain form of the interview questions and the order and structure can change between the interviewees. The semi-structured interview is like a discussion of a certain topic. (Saaranen-Kauppinen & Puusniekka, 2006) The interview consisted of 21 questions. The interviews were divided into three themes which were supplier selection criteria, sustainable supplier selection and evaluation & monitoring.

The company representatives were from different positions, and they were selected by their deep understanding of the supplier selection and evaluation process and knowledge of sustainability. The different positions of the interviewees ensured versatile perspectives and deeper information. All the interviewees and case companies are kept anonymous. Therefore, case companies were divided by letters: A, B, C, and D.

All in all, 7 interviews were conducted. The final interviews were conducted online via Microsoft Teams during October and November 2021. The interviews were conducted online because of the current Covid-19 pandemic. The interview questions were sent via email for interviewees beforehand which helped companies' representatives to familiarize with the research topic and prepare their answers. However, the interview questions varied a little bit between the different representatives from the same organization. In addition, the order of the questions was different in the interviews and some additional questions were presented in each of them. Consequently, every interview elicits some new data. Moreover, the interviews' data were recorded with an audio-recording system. The longest interview was about 1h 14 minutes and the shortest was about 25 minutes. The interview language was Finnish to ensure deep understanding for both participants. The table 5 presents the interviewee's positions, their responsibilities, duration of the interview and the question themes.

Table 5. List of the interviewees

Company	Positions	Responsibilities	Interview themes	Duration of the interview
A	Sourcing manager	Categories of technical services, contracts, biddings and implementation, sourcing projects, buyer-supplier relationship	Supplier selection criteria, Evaluation & Monitoring	35min
A	Category manager	Management of rotating equipment and valves category, strategical sourcing of technical materials and services	Sustainable supplier selection, Evaluation & Monitoring (extra: Triple bottom line)	1h 14min
A	Manager of technical services	Strategy, sourcing, and operative procurement of service category	Supplier selection criteria, Evaluation & Monitoring	35 min
B	Suppliers 'sustainability specialist	Responsible for sustainability development of suppliers	Supplier selection criteria, Sustainable supplier selection, Evaluation & Monitoring	41 min
C	Manager, Reporting and Standards	Yearly reportage, climate issues, emission inventory	Supplier selection criteria, Sustainable supplier selection, Evaluation & Monitoring	50min
C	Manager, Supplier Development	Responsible for sourcing and sustainability	Supplier selection criteria, Sustainable supplier selection, Evaluation & Monitoring	40min
D	Sustainability specialist	Sustainable development, sustainability projects, supplier selection projects	Supplier selection criteria and Evaluation & Monitoring	25min

The first theme of the interviews was focused on supplier selection criteria. It aimed to consider sustainability's role in supplier selection criteria and to figure out how much case companies emphasize sustainable supplier selection criteria compared to traditional criteria. The second theme deepened to sustainable supplier selection by considering the supplier selection process and different factors that might impact on sustainability requirements. The

third theme was focused on supplier evaluation and monitoring. It aimed to explore case companies' methods to monitor and evaluate suppliers' action in terms of sustainability.

3.1.2 The data analysis

After the interviews were conducted the following step was to analyze data by transcribing it. Consequently, the data was analyzed by content analysis. According to Downe-Wamboldt (2009), content analysis refers to research analyzing method which helps to form implications from recordings, written or visual data. In this case the data was recorded. Moreover, content analysis is a systematic method which supports describing specific phenomena. Researchers can test theoretical phenomena and gain deeper knowledge by using content analysis (Elo & Kyngäs, 2007). Thematic content analysis refers to interpreting verbal material which is typically storylike form (Smith, 1992, 4). According to Stemler (2000), content analysis is beneficial to investigate trends. Consequently, content analysis is suitable for this research. This thesis has clear phenomena, and the data was recorded from the interviews. In other words, sustainability has been a trend for a while, so according to Stemler's (2000) recommendation, content analysis is suitable for this research. However, after the data analysis further implications were conducted and findings were formed.

3.2 Reliability and validity

Reliability of the research ensures that the results are stable and coherent. In other words, if other researchers conduct the same study about the same topic they would end up with similar results. However, it requires the interview techniques and methods to be the same as in the original research. (Riege, 2003) Reliability ensures that the research is conducted properly, and the findings are not biased. However, in qualitative case study the reliability might be a challenge because it does not include statistical measurements like in the quantitative research (Riege, 2003). Validity refers to the correctness of the research results (Altheide & Johnson, 1994). In other words, it considers the research results and evidence truthfulness. (Guion, Diehl, & McDonald, 2011) In theoretical basis validity can be divided into two categories. Those are internal and external validity. Internal validity shows how accurately the evidence supports the theoretical claims (Taylor, 2013, 11). External validity

measures how well the results can be generalized and applied to different situations, timeframes, and samples. (Taylor, 2013,14)

The language of the interviews was Finnish which increased the reliability of the research because it enabled deeper consideration and discussion. Therefore, holding interviews in native language ensures better understanding. Moreover, the reliability increased because of the multiple case companies. According to Saunders, Lewis, & Thornhill (2016, 187), the multiple cases enable the replication which refers straight to the reliability. In addition, the internal validity of this thesis was increased by using multiple case studies and by interviewing different personnel of the case companies to get a broader picture. According to Klenke (2016, 69), the multiple case studies' results are more robust and compelling which lead to more reliable and valid scientific results. However, the external validity of the research is decreased because the case companies are from quite similar industries. Consequently, the results of this thesis cannot be generalized to different industries.

3.3 Descriptions of the case companies

The primary data of this thesis was gathered by interviewing personnel from four different case companies. The case company A is a technology company which buys technical services and materials. They have about 400 suppliers and most of their suppliers are from Finland, but the rest are from Europe, mainly from Middle-Europe and Baltic countries. This company has strong sustainability values which have the central role in the company's strategy. The company B is focused on bio economy. They supply chemicals, services, and indirect procurements of factories. This company has a broad supply base which consists of about 20 000 suppliers. Furthermore, their suppliers are from different fields and most of them are from European countries where company B has its own factories. However, 1,5% of their suppliers are from risk countries in Asia. Company C is focused on the forest industry. They have about 24 000 suppliers who are mainly located in Europe. Moreover, they have many suppliers in South America. However, they also have global suppliers in North America and in Asia. Company D is a planning and consulting company which helps organizations in transition to a sustainable society. For instance, they are focused on digitalization of manufacturing, bio economy and energy markets. Company D does not have

its own supply base. However, they provide suggestions of suitable suppliers for other organizations who have a need for suppliers. In other words, they offer service for other companies and help them to find the best suppliers. The core of their action is to conduct supplier selection projects.

4. Findings

After the interviews were conducted the analysis of the data started by transcribing recordings. The analysis was made by following interview themes to keep analysis clear. The target was to compare case companies' actions and recognize similarities and differences between them.

All case companies are very motivated to collaborate with sustainable suppliers. According to the interviewee 1 from company A, they are motivated to search for sustainable suppliers because the company's strategy is focused on sustainability. The company aims to be on the top of the sustainable development, and they pay attention to sustainability in all actions. In company B personnel motives to search sustainable suppliers because they want to be a sustainable organization. However, the interviewee 4 pointed out that nowadays it is not enough that the company itself operates in a sustainable way. Nevertheless, they must pay attention to the whole supply chain's actions. In addition, interviewee from company B highlighted that pressure from clients, investors and society motivates them to be a sustainable company. Moreover, the positive reputation also motivates company B' personnel to search for sustainable suppliers. The significance of sustainability is highlighted in the future, and it motivates company C's purchasers to search for sustainable suppliers. Furthermore, the sustainability goals of the organization motivate them to search for sustainable suppliers. Consequently, sustainable suppliers can help them to achieve these sustainability goals. Company D's purchasers are motivated to find sustainable suppliers because the responsible choice is usually financially the most profitable. In addition, the brand's reputation also motivates company D's targets to be sustainable. All in all, personnel from case companies are motivated to search for sustainable suppliers because they want to achieve their goals and have a good reputation as a sustainable actor.

4.1 Supplier selection criteria

The consideration of supplier selection criteria started with comparing traditional selection criteria and deepened to comparing sustainable criteria. According to interviewee 1 from company A, the organization's guidance, and the nature of the projects effect on the

formulation of the supplier selection criteria. For instance, the specific attributes of the project have an impact on the supplier selection criteria. However, their most important supplier selection criteria include approved compliance check, technical capacity, resources, and availability. In other words, they check suppliers' backgrounds and utilize traditional selection criteria. Service suppliers should also follow the act on the contractor's obligations and liability law which ensures that suppliers fulfill their legal duties such as tax paying and pensions. The other common supplier selection criteria focus on prices, credit reports and commercial terms. According to interviewee 3, supplier selection criteria also ensure "Total cost of ownership" (TCO) approach during the life cycle of supplier relationship. They must check safety issues, ability to produce service, prices, sustainability requirements, compliance, and paid taxes of every supplier. These criteria form the bottom and those must be at a certain and acceptable level.

In company B the formulation of the supplier selection criteria depends on the procurement. In other words, they consider what are the relevant criteria for certain procurement. For example, product safety issues are more important with certain products. In addition, they pay attention to risk analysis in the formulation of selection criteria. They figure out which risks are highlighted in risk analysis, and which have harmful consequences. Moreover, the requirements in law must be considered in the criteria formulation process. In addition, clients might have some requirements which they have to pay attention to. However, the most general supplier selection criteria in company B include quality and price. Those must be at an acceptable level. The purchasers from company B also pay attention to compliance issues. For example, with chemicals the criteria focus on ensuring safety. This company requires suppliers to pass the questionnaire which includes quality requirements, risk management questions and sustainable development requirements. Supplier candidates must pass this questionnaire before they can be selected as a supplier. In some cases, it is possible to choose the supplier without passing all the requirements in the questionnaire if the supplier is engaged to develop their operations.

The general supplier selection criteria in company C include price, quality, risk measurements and economic issues. The interviewee 6 described that they ensure the suppliers have enough good financial position that they can stay in the market the required time. According to interviewee 5 from company C, the megatrends impact on formulation

of supplier selection criteria. Instead, company D's main action is to recommend suppliers for customers. Their supplier selection criteria focus on financial measurements, safety and human rights issues, sustainability criterion and the use of ISO certifications.

4.1.1 Sustainable selection criteria

In terms of sustainability, purchasers from company A requires their suppliers at least to accept their ethical terms which includes obeying laws and themes of the triple bottom line. For instance, they expect suppliers to be economically responsible by acting against corruption, following honest competition, avoiding money laundering and conflict of interest. In addition, they require suppliers to follow human rights and ensure safe working conditions. The ethical rules incorporate an environmental aspect which considers environmental impact and climate change. The last requirement of the ethical terms is reportage. In other words, these ethical terms form the minimum sustainability requirements for the suppliers. Consequently, it ensures that suppliers follow a certain level of sustainability. However, the compliance check is also one minimum requirement that suppliers must pass. There are also other sustainability criteria for suppliers which pay attention to economic and social aspects of the triple bottom line. Those are mainly based on acts on the contractor's obligations and liability law. The economic criteria consider the result of the contract or project because it should be profitable in the end. Moreover, purchasers from company A requires suppliers to meet legal duties such as paying taxes. The social criteria ensure fair wages and pensions for employees. In addition, social criteria require suppliers to ensure safety management. Nevertheless, the environmental side of the criteria has not so deep focus on. However, environmental, and sustainable development criteria are still in the development level.

According to interviewee from company B, they have included some of their sustainable supplier selection criteria in the requirement questionnaire. Their sustainable criteria are focused on the environmental aspect. In addition, work safety has a lot of importance because of their industry. They also check what kind of capabilities potential suppliers must develop in terms of sustainability. Moreover, with sustainable supplier selection criteria they try to ensure their whole supply chain is sustainable. In company B they require suppliers at the minimum to follow their code of conduct. Nevertheless, they accept the supplier's own code

of conduct rules if the content is corresponding to their own. The minimum sustainability requirements also include background checks such as sanctions or criminal background checks. In addition, the questionnaire which includes social and environmental aspects must be passed. For example, in logistics they pay attention to emission levels. However, the background check also considers the economical aspect. Potential supplier candidates must have a stable financial position.

In terms of sustainability, in company C they require suppliers at the minimum to follow the supplier code which is based on the code of conduct. However, the different product categories include certain standards that must be followed. According to interviewee 5, an example of the minimum requirement is to find out the origin of the product and ensure that the origin is suitable. In addition, minimum requirements ensure that suppliers' operations are legal, and they do not use child labor. According to their code of conduct report, they focus on ensuring human rights, well-being, and safety at the social aspect of the triple bottom line. Moreover, they take care of the environmental side of the triple bottom line by paying attention to their impacts on nature and minimizing the harmful consequences during the whole life cycle of the product. The economical aspect is focused on avoiding bribery and corruption. According to interviewee 6 from company C, they do the supply qualification test which ensures the basic requirements are in order. Company D tries to pay attention to all aspects of the triple bottom line. For instance, with equipment they pay attention to usage of the critical natural resources, eco-friendly materials, optimization of the package and logistics. They also pay attention to reusability of the materials. The safety issues have also a lot of emphasis. The table 6 summarizes the different selection criteria.

Table 6. Case companies' criteria

	Company A	Company B	Company C	Company D
Traditional Criteria	Compliance check, technical capacity, resources, and availability	Quality, price, compliance check, risk management issues	Financial measurements, safety and human rights issues, sustainability criterion and the use of ISO certifications.	Quality, education, financial metrics
Sustainability Criteria	Economic criteria: corruption, honest competition, avoid of money laundering. legal duties Social criteria: human rights, working conditions, fair wages	Environmental minimum criteria, background checks, social criteria such as safety,	Code of conduct, origin of the products, child labor, human rights, well-being, and safety. Economic criteria: against bribery and corruption, environmental criteria: pay attention to impacts on nature and minimize harmful consequences	All aspects of triple bottom line in code of conduct. Pay attention to usage of the critical natural resources, eco-friendly materials, optimization of the package and logistics, reusability of the materials, safety, human rights, corruption and avoid of money laundering.
Factors that impact on formulation of selection criteria	The organization's guidance, nature of the project	Depends on the procurement, risk analysis, requirements in law	Megatrends	Triple bottom line

According to interviewee 1 from company A, sustainability criteria such as ethical terms and contractor's liability law are very important compared to traditional supplier selection criteria such as price and availability. In other words, those cannot be given up. However, the environmental aspect has not so much importance currently, but it will have more weight in the future. According to interviewee 4 from company B, the importance of sustainable criteria is at a certain point in the same importance level as the traditional criteria. Those both are included in the minimum requirements which are presented in the beginning of the

selection process. All in all, traditional and sustainability selection criteria are not at the same importance level because quality and costs have a more critical role in the final selection. According to interviewee 5 from company C, the importance of sustainability criteria is increasing the whole time. In other words, the minimum requirements for suppliers include sustainability criteria which prove the significance of them. According to interviewee 5, the role of sustainability criteria is growing. For example, in the future CO2 emissions might increase the importance as a selection criterion along with price. In addition, the interviewee 5 described that client's requirements and targets of the organization raise the significance of the sustainability criteria. However, the interviewee 6 from company C described that sustainability criteria are critical, and they do not give up on them. Moreover, sustainability is a huge theme in this organization which raises the importance of sustainability criteria. The interviewee from company D estimates that the role of the sustainable supplier selection criteria is more important nowadays. The traditional criteria such as price and attributes of the equipment must be considered but also the sustainable aspect should be paid attention.

All case companies highlighted the importance of sustainability selection criteria with traditional selection criteria. The importance of sustainability criteria is clearly growing and there are already minimum sustainability requirements that suppliers must pass. In conclusion, sustainability criteria have the same importance level in the beginning of the selection process than traditional criteria. However, the traditional criteria are more critical in the final selection of suppliers.

4.2 Supplier selection process

Interviewee 2 describes case company A supplier selection process deeply. The process starts by identifying a technical need. After that they send a self-assessment questionnaire for candidates which sum up the general information of supplier candidates such as products and quality offerings. Next, they evaluate self-assessment results and do controls such as financial checks and counterpart screening checks. In other words, counterpart screening checks are focused on sustainability issues. The following step is to do technical analysis and audition. Finally, all the information will be analyzed, and the final selection will be made. Moreover, the interviewee 2 was asked to identify the most important steps in terms

of sustainability. He said the counter partner screen is one of the most crucial and the compliance check must be passed. In addition, it is relevant that supplier candidates approve the code of conduct in the early stage of the process. In other words, these are the most critical steps of the process in terms of sustainability. According to interviewee 2, the supplier selection process is a very crucial procedure in the implementation of the sustainability of the firm. If they do not pay attention to sustainability issues in the supplier selection process, they might face huge risks. Consequently, counter partner screen function has become a very essential tool in company A because they can ensure sustainability standards for suppliers by using it. In other words, the counter partner screen function shows red light if the supplier does not follow sustainability standards which are required. Moreover, the code of conduct must be approved during the supplier selection process. This increases the importance of sustainability in the supplier selection process.

According to interviewee from company B, their supplier selection process starts with the background checks. For instance, they do the compliance check and figure out the financial position of supplier candidates. Following stage is a bidding in which they give a self-assessment questionnaire to supplier candidates who are in a certain category or are from risk countries. After that they evaluate candidates and do auditions if it is necessary. Based on the self-assessment questionnaire they give feedback and improvement suggestions from supplier candidates.

According to interviewee 5, the beginning of the supplier selection process is critical in terms of sustainability. It is important to ensure that minimum requirements are passed in the early stage. The interviewee 6 pointed out that they do not choose a supplier without approval of sustainability requirements. Consequently, significant steps in company C in terms of sustainability are supplier third part code and qualification. In other words, sustainability has a crucial role in the supplier selection process.

In both companies A and B, the compliance check is an essential part of the beginning of supplier selection process. However, company C has a supplier third party code. Therefore, the beginning of the selection process is crucial in terms of sustainability. In addition, the supplier evaluation part is also critical for suppliers' sustainability in the selection process

steps. All in all, the supplier selection process plays a crucial role in the sustainability of the suppliers. It ensures that buyers find the suppliers who have capabilities and desire to operate in a sustainable way. All case companies were concerned that the beginning of the supplier selection process is the most important stage in terms of sustainability.

The supplier evaluation and comparison are essential parts of the supplier selection process. The most important evaluation methods in company A are the counter partner screen function which shows the basic information from external sources. Moreover, the technical audition is a very effective method to assess a potential supplier's sustainability. In other words, technical auditions are implemented on the spot of certain manufacturing places. Therefore, it makes it possible to observe suppliers' actions more deeply and evaluate the working environment. According to interviewee 4 from company B, it is hard to evaluate and compare potential supplier candidates. There are many indicators, but the results can be defined in many ways which make the evaluation challenging. In addition, the one metric does not tell the whole truth. In other words, interviewee 4 from company B recommends utilizing multiple indicators. The interviewee also mentioned the external database which is useful in evaluation. The interviewee 5 from company C described that systematic and standardized questionnaire are relevant methods to supplier evaluation. In addition, external services which share the information of supplier auditions are very useful in supplier evaluation. The combination of the comparison of the numbers and qualitative factors are the best evaluation method according to interviewee 5. All in all, case companies have different methods to compare and assess supplier candidates. However, they all mentioned that external services are very useful for evaluating suppliers. In other words, external resources turned out to be a significant source of sustainability information which helps in supplier candidates' comparison.

4.2.1 Categorization

The suppliers can be categorized by an importance and risk of products or at a level of buyer-supplier relationship. According to interviewee 2 from company A, ensuring sustainability is significant for all kinds of products, services, and materials. However, the interviewee 2 argued that ensuring sustainability is legally a little bit more important for different raw

materials. Especially for the waste of so-called feed stocks. In other words, it is important to find out the origin of the feed stocks. However, the interviewee from company B told that their questionnaire considers all aspects of sustainability. Especially, it includes more social and environmental questions and economical aspects are considered in background checks. Nevertheless, the type of the procurement impacts on the emphasis of the sustainability aspects. For instance, if the company B source workforce they emphasize more on social perspective including safety of working conditions.

According to interviewee from company B, “Ensuring specific sustainability areas is more important for certain procurements depending on the highlighted risks.”

In other words, if there are high risks in some sustainability areas with certain procurement, they focus on avoiding those risks. According to interviewee from company B, these products with higher risk might impact on the sustainability requirements. For instance, work safety is more important in worksites and environmental safety with certain products. Interviewee 5 from company C highlighted there are differences with the importance of sustainability between product categories. For instance, some categories require detailed information about the origin of the product or raw material. Furthermore, volume and effectiveness are significant factors which impact the importance of sustainability. However, the interviewee 5 pointed out that it is important to ensure sustainability with all kinds of products, but it might be more important in certain categories. The interviewee 6 from company C, told that the criticality of the product impacts on the importance of sustainability. The global location might also raise the importance of sustainability.

According to interviewee 2 in company A, there is no difference between the sustainability requirements and evaluation in the different levels of buyer-supplier relationship. All suppliers must accept code of conduct requirements. However, in practice there might be differences in supplier evaluation between the active suppliers and non-active suppliers. In other words, the collaboration is tight with active suppliers which makes it possible to evaluate them more often. For example, if company A does not order anything during a year and the supplier contract is coming due, there is no need for deep evaluation. Consequently, the level of buyer-supplier relationship does not straightly affect sustainability evaluation and monitoring. Nevertheless, in practice the activity level affects the monitoring of the

supplier's sustainability. According to interviewee 4 from company B, the supplier relationship might affect the monitoring level of sustainability. For example, with permanent suppliers or in close long-term relationships the monitoring level might be higher. Nonetheless, in other cases they are developing the categorization method incorporating the importance and risk approach. In other words, interviewee 4 referred to Kraljic portfolio matrix approach. In the company C the different levels of buyer-supplier relationship depend on the importance of the product or raw material. Consequently, they monitor more deeply the important product categories and raw materials. The interviewee 6 pointed out the more focus they have on relationships the more precise is monitoring. In other words, it is more essential to monitor suppliers in certain areas.

According to interviewee 2 from company A, there is no straight impact of the category on sustainability of the product or service. In other words, sustainability requirements at the minimum level are similar for all kinds of products and services. This differs a little bit from the view of interviewee 4 from company B because she identified different risk areas which need more effort in terms of sustainability. Consequently, in company B the product category might have a straight impact on the level of sustainability requirements. However, the interviewee's 5 view from company C considered product effectiveness, volume and location which might affect the sustainability requirements. In conclusion, the importance of sustainability can differ between Kraljic Portfolio Matrix's categories. The categorization of the products did not give a clear answer for which product category needs the most effort to ensure sustainability. However, the leverage category is highlighted by two case companies. All in all, case companies were concerted that sustainability is important with all kinds of products but with certain products the need for ensuring and monitoring sustainability might be higher.

In addition, the level of buyer-supplier relationship does not have a direct impact on the level of supplier evaluation and monitoring. However, the buyer-supplier relationship collaboration level might have an indirect impact on the monitoring of suppliers' sustainability. In terms of supplier activity, the monitoring levels of sustainability are different between suppliers in company A. If suppliers are active and have more collaboration with buyers, the level of sustainability monitoring is more intensive. Therefore, it is natural that buyers use more resources for suppliers who they collaborate closely than

suppliers who are not anymore active. Compared to the view of interviewee 4 from company B, the results are similar between company A and B. In other words, interviewee 4 from company B interprets that supplier relationship might affect the monitoring level of sustainability. The implication is the same as the interviewee 2 from company A made. He suggested that more active supplier increase the level of sustainability monitoring. Furthermore, the same observation was made in the company C. They also monitor suppliers 'sustainability more deeply if they have a deeper relationship with suppliers. Therefore, the similar observations from case companies shows the supplier's activity level is a crucial factor. In conclusion, the buyer-supplier relationship has an indirect impact on the monitoring level. The role of monitoring suppliers 'sustainability is more significant in closer and more active buyer-supplier relationships.

4.2.3 Evaluation and monitoring practices

The theory part presented different supplier monitoring practices which are corresponding than case companies have utilized. According to interviewee 2 from company A, they evaluate and monitor their suppliers' financial position, quality of the products, delivery times and public information. According to interviewee 1 from company A, they utilized a compliance check and HSEQ in supplier's sustainability monitoring. They also check contractor's liability law principles at minimum once in the year and always with the new contract. The credit report checks are done constantly. The most suitable method to monitor suppliers 'sustainability is an audition, external reviews and regular reporting. However, in the company B they utilize background checks in monitoring sustainability. Background checks include an alarm system which alerts if something deviant occurs. In addition, in company B they evaluate and monitor suppliers by using self-assessment questionnaires and auditions. The ethical channel is also one monitoring method which is open for suppliers and it helps to get information. They also aim to improve the skills and knowledge of personnel. Consequently, the personnel pay more attention to sustainability issues if they have enough knowledge and might require more suppliers to develop. Moreover, they utilized external firm's sustainability rating services. Interviewee 4 from company B defines audition to be the most relevant monitoring practice. It considers sustainability issues deeply and it provides the possibility to observe operations closely. In other words, it provides more information than self-assessment questionnaires and information in paper.

The interviewee 4 also added: “This is not only about the monitoring but also about encouraging suppliers to be sustainable. It drives suppliers to be more sustainable”

Purchasers in the company C utilize yearly questionnaires in certain categories but at least all suppliers must pass and accept the code of conduct rules. Moreover, audits are an effective monitoring method. They also have self-assessment questionnaires and different indicators. According to interviewee 5, the most relevant sustainability monitoring practice is to have a standardized system which collects and compares supplier information. In other words, it is easier to notice deflections from the system. However, the audits are also necessary because those ensure the correctness of the information in the system. According to interviewee 6, audits are the most relevant supplier monitoring system because those verify supplier’s actions. In other words, interviewees from company C have also similar experiences than other interviewees from the case companies. On paper suppliers’ actions might look good but, their operations are not truly sustainable. For this reason, auditing is the best monitoring method.

Case companies have different sustainability monitoring methods and systems, including compliance and background checks. The remarkable observation is that all case companies mentioned the audit to be the best sustainability monitoring method. It refers to the fact that the audit allows buyers to observe supplier’s action closely and it gives a more realistic picture of operations than supplier self-assessment questionnaires. In conclusion, the precise monitoring of sustainability is time consuming if companies monitor by auditing. However, the audits are crucial because they verify suppliers' sustainability actions very well. The self-assessment questionnaires pointed out from interviewees as another common sustainability monitoring method. However, self-assessment questionnaires do not verify the supplier’s sustainability actions. All in all, there are only a few methods which case companies felt to be relevant for monitoring sustainability.

4.3 Monitoring of sustainability

The monitoring of supplier’s sustainability differs from monitoring of supplier traditional actions such as economical procedures. The monitoring of sustainability is challenging

compared to monitoring of supplier's general action. Interviewee from company A justifies this claim by the fact that they have only few tools and processes for monitoring sustainability. For these reasons, the supplier's sustainability monitoring has not so much emphasis in this case company. Interviewee 2 describes that the level of monitoring supplier's sustainability is quite low. The measuring of sustainability is hard, and they should require certifications for suppliers periodically.

The interviewee from company B also described "The monitoring of supplier's sustainability to be more difficult than monitoring of general operations."

In terms of sustainability, many things look good on suppliers' papers but, those do not mean anything for the supplier. Interviewee 4 described that it has been challenging to see the real level of sustainability because the hype has been high, and many suppliers try to hide their sustainability challenges. In addition, there are so many sustainability indicators and metrics, so it is challenging to compare them. The interviewee 6 from company C, describes monitoring of suppliers to be more interesting and deeper than monitoring of suppliers' general operations. In other words, the monitoring of traditional operations is more mechanical such as monitoring paying bills. Instead, the monitoring of sustainability is more about listening and expanding the understanding. However, monitoring sustainability is also challenging according to interviewee 6 from company C. There are no proper meters, and the qualitative nature of sustainability brings its own challenges. In other words, monitoring of sustainability lean on an organization's own view of trust on suppliers. The interviewee 7 from company D also describes the monitoring of supplier's sustainability to be hardly verifiable. However, it could be useful if the sustainability monitoring could be at the same level as the monitoring of supplier financial performance. In other words, the deep monitoring of suppliers 'sustainability is missing.

All the case companies described the monitoring of sustainability to be more challenging than monitoring of supplier's general actions. In addition, the level of monitoring is not so high in case companies. However, the need for monitoring is relevant because the verifiability of supplier's sustainability actions is at a low level in general. The main reason, according to case companies, is that there are no proper meters and methods for monitoring sustainability. In conclusion, the role of sustainability in supplier monitoring is complicated

but critical. However, it has not so much emphasis and there is a lack of proper sustainability monitoring methods. In conclusion, the role of sustainability in supplier monitoring is still new because there are not so many methods available. In addition, it differs from monitoring of supplier general operations such as economical liabilities. Monitoring of sustainability requires deeper analysis than economical checks and it is more time consuming.

4.3.1 Sustainability challenges with suppliers

According to interviewee 2 from company A, they see all dimensions of the triple bottom line equally important. The operation is not sustainable if some of the aspects are neglected. However, it is not an easy task to find sustainable suppliers. According to interviewee 1, the short time-period to find a sustainable supplier might be a challenge. In addition, the industry affects sustainable actions. For instance, smaller companies might have difficulties to certify their sustainable actions if they do not have enough resources. In other words, the challenge is to compare and evaluate the suppliers because the measurements and certifications are not standardized. In other words, the other challenge with supplier's sustainability is to figure out what is true and what is false information. It is challenging for suppliers to prove in practice what they have promised in the contracts. According to interviewee 2, some suppliers have colored their sustainability operations to look better than those are. For example, they might have counterfeited their documents and it has led to questionable documentation. This motivates personnel in company A to execute audits and make sure that everything works in the way that suppliers have promised.

The interviewee 4 from company B described "The monitoring of supplier's sustainability is challenging."

They have given a lot of effort to figuring out their first-tier suppliers' sustainability operations. However, the challenge is to ensure sustainability operations in a deeper supply chain. In addition, the broad supply base brings its own challenges in monitoring. The supplier self-assessment questionnaires are also problematic because those do not guarantee the reality. Although the self-assessment questionnaires include descriptive questions which confirm the information correctness, those must be considered in a critical way. According to interviewee 5 from company C, a big volume might cause challenges in monitoring

sustainability. Furthermore, interviewee 5 highlighted the same challenge as the other companies have described which is the reliability of the supplier's information. For example, the challenge is to verify the information in long supply chains and overall to achieve enough information of the previous tier supplier. The interviewee 7 from company D has similar thoughts about the challenges of sustainable suppliers than other case companies. According to interviewee 7, most of the suppliers try to seem sustainable and responsible but the challenge considers are they trustworthy. In other words, is the level of real sustainability the same as the suppliers have described it to be. For example, do suppliers consider where the materials and main components come from. The challenge is to see what happens in real.

All case companies mentioned the same challenge in supplier's sustainability. Therefore, the main challenge is to verify the supplier's sustainable operations. Every supplier wants to show that they are sustainable, but it is not clear if they act in a sustainable way. Therefore, this is related to the fact that the role of sustainability is at a low level in supplier evaluations. If buyers would require more certifications and evidence of sustainable actions the situation could be different. Even though companies do not see much effort in supplier evaluation and monitoring, those are relevant procedures. In other words, observations from case companies show that the main challenge is to verify sustainability of the suppliers' operations. The only way to overcome this challenge is to increase monitoring.

4.3.2 Barriers and problems in sustainability

According to interviewees from case companies, there might be barriers to sustainability. The interviewee 4 from company B highlighted that the lack of resources or skills might be a barrier for sustainability and the suppliers' willingness to do sustainable operations. Moreover, the interviewee 1 from company A described that they haven't recognized barriers for supplier's sustainability. However, interviewee 1 also mentioned that lack of resources might be a barrier. The interviewee 5 from company C described that supplier might have barriers to sustainability if they lack knowledge and knowhow of sustainability. In conclusion, resources and knowhow are prerequisites for sustainability.

Without resources or knowhow companies might face challenges or even barriers to execute sustainable operations.

Purchasers in the company A has a certain process which they follow if they want to solve supplier' sustainability problems. Firstly, they consider the issue internally and evaluate the consequences. Secondly, they consider the issue with the supplier. Consequently, they figure out the causes of the problem and find out fixing procedures. After evaluation with supplier purchasers do the possible reclaim if there is a breach of contract. The following step is to form a plan for fixing the issue and respond to the consequences. Therefore, when the plan is ready, they monitor the procedures. However, if the situation will not get better the final act is to end the supplier relationship and look for a substitute supplier. According to interviewee 4 from company B, they try to solve the problem with the supplier and continue the collaboration with supplier. Therefore, they try to give development suggestions and monitor how suppliers improve their operations. However, if the supplier has a substantial problem such as crime, purchasers from company B will finish the collaboration with the supplier. In the company C the aim is to solve every sustainability problem. Their government deals with the problem and reports depending on the issue. All in all, case companies aim to solve the issue and retain supplier relationships in sustainability problem situations. They have their own problem-solving procedures, but they all aim to solve the supplier's problems before changing a supplier. In other words, the threshold is high to change a supplier.

4.3.3 Sustainability's role in the future

Interviewee 1 from company A described the role of sustainability to be significant in the future in their organization. However, the covid-19 pandemic has slowed down the sustainability initiatives but in the future the role will increase. Interviewee 2 from company A also highlighted that the role of sustainability will increase. The role will be in the core of their strategy, and it will be emphasized in supply functions.

The interviewee 2 from company A described "The role of sustainability will significantly emphasize in supplier selection and supply chain's in the future."

According to company B, the sustainability's role will increase in the future in their operations and suppliers' actions. Therefore, interviewee 4 pointed out that the role of supplier's sustainability will be even more important in the future. The increase is affected by a law proposal of the European Union. In addition, the general view is that it is not enough that an organization itself is sustainable, but they should pay attention to sustainability of their supply chains. The interviewees from company C also think that the role of sustainability will be more significant in the future. They said that sustainability is integrated in reporting, and it is included in daily work. The interviewee 5 estimated that in the future only sustainable organizations can succeed. In addition, the law initiatives will drive companies to act in a more sustainable way in the future. In conclusion, the role of sustainability will increase in the future.

Table 7. Summarize of conclusions

	Summarize of conclusions
Importance of sustainability criteria	-The importance of sustainability criteria is growing and there are already minimum sustainability requirements that suppliers must pass -Sustainable criteria are as important than traditional criteria in the beginning of the supplier selection process
Supplier selection process	-The beginning of the supplier selection process is the most critical part in terms of ensuring sustainability -Minimum sustainability requirements must pass
Categorization	-Sustainability important with all kinds of products, but with certain products the need for ensuring and monitoring sustainability might be higher. -Higher risk, volume and location might increase the sustainability requirements
Buyer-supplier relationship	-Supplier's activity might impact on the monitoring of the sustainability. - The role of monitoring suppliers 'sustainability is more significant in closer and more active buyer-supplier relationships.
Evaluation and monitoring practices	-Audition is the most important sustainability monitoring method - Self-assessment questionnaires also common evaluation method
Monitoring of general actions vs. monitoring of sustainability	-Monitoring of sustainability is more challenging than monitoring of supplier's general action -Monitoring of sustainability needs more analysis, time and understanding
Solving process of sustainability problems	-The general implication from this study is that the case companies aim to solve problems and continue the collaboration by developing suppliers' actions
Barriers for sustainability	-The most common barrier for sustainability is lack of resources
Challenges with supplier's sustainability	-Suppliers' sustainability monitoring is the biggest challenge with suppliers because the verifying is difficult, and companies are lack of proper monitoring methods

All in all, table 7. summarizes the most essential findings of this thesis. The table include conclusion of the case companies' supplier selection process, classification, monitoring and description of the sustainability challenges.

5. Discussion and conclusions

The aim of this research is to describe the role of sustainability in supplier selection and evaluation. Sustainability has increasing importance and suppliers are in the central role in supply chain sustainability. There is plenty of previous literature about the supplier selection criteria and evaluation methods. In addition, the sustainability aspect has been studied in terms of supplier selection criteria. However, the understanding of the role and the importance of sustainability is still lacking in the supplier selection and evaluation processes. Consequently, expanding the previous literature this thesis was conducted and personnel from 4 case companies were interviewed. This chapter discusses the research topic by giving answers for the research questions and reflecting results from case companies to reality. Moreover, the chapter summarizes the main findings of the thesis and compares empirical and theoretical parts together. In the end of the chapter the future research topics are discussed.

5.1 Discussion of the empirical results

In this chapter the empirical results are compared to the theory part. Consequently, discussion gives implications and basis for the answers to the research questions. In other words, this chapter summarizes main findings and reflects them to the theoretical findings. The discussion starts in the same order as the empirical part. The first analysis is considering the motives of sustainability. The results show that the same motives are highlighted in the theory part as by the case companies. In other words, the empirical results of motives are in-line with the previous literature. For instance, interviewee from company B defined pressure of shareholders to be a motive of sustainability as the previous literature has described (Bansal & Roth, 2000). In addition, interviewee from company D mentioned the economic motivations that were also described in the previous literature in the theory part (Dillon & Griffith, 2001, 174-175).

The supplier selection criteria were not so clear as case companies' sustainability motives. According to the theory of Chen (2011), traditional supplier selection criteria can be divided as an "organization factor" and a "competition factor". Interviewee 1 from company A sees organizational factors important in traditional supplier selection criteria. Their most

important traditional supplier selection criteria are focused on compliance check, technical capacity, resources, and availability. Consequently, in the company A, they are more focused on organizational factors in terms of traditional criteria. However, in the companies B and C traditional selection criteria are more focused on the competition factors such as price and quality. However, all case companies mentioned financial measurements or prices to be one of the significant traditional selection criteria. This is a similar observation as in the theory part (Gurel, et. al., 2015). Moreover, many traditional selection criteria which were presented in the theory chapter were also highlighted by case companies. For instance, reliability such as financial position and technical performance were mentioned by several case companies. In addition, compliance checks and risk measurements were mentioned by a few case companies. All in all, case companies have different factors which affect the formulation of the selection criteria but there are a lot of similarities between case companies' traditional criteria. In other words, the emphasis of the criteria might differ a little bit.

Most of the case companies utilize a quite similar approach than Chen's theory (2005) of two stages in supplier selection process. They have minimum sustainability requirements which suppliers must accept before even being considered as a supplier candidate. The sustainability criteria were quite similar in all case companies than in the theory chapter. The employees' rights, impacts on nature and honest competition were highlighted by case companies as in the theory (Molamohammadi, et al., 2013; Giannakis & Papadopoulos, 2016). However, case companies emphasize the triple bottom line differently. In the company A the focus is on the social and economic aspect of the triple bottom line. Nevertheless, the environmental aspect has not so much attention. On the contrary, in the company B the emphasis is on the environmental aspect of sustainability. However, companies C and D aim to pay attention to all aspects of the triple bottom line more evenly. The social aspect of the triple bottom line is highlighted by all case companies and the criteria were similar as in the theory chapter. For instance, safety and human rights are significant factors that case companies want to ensure.

In conclusion, case companies have corresponding sustainability criteria as in theory part and they expect suppliers at the minimum accept the sustainability requirements. In other words, sustainability requirements are included for example in code of conduct or

compliance checks. However, case companies highlight different aspects of the triple bottom line but in general they pay attention to the whole triple bottom line in selection criteria. The case companies also show the role of the sustainability criteria is significant and it will rise in the future. This observation is supported by the theory which claims that the amount of the sustainability criteria has been increased or even doubled during the past decades (Dickson, 1966; Amindoust et al., 2012). In conclusion, the role of sustainable selection criteria has been more important and even necessity. This claim is supported by the fact that the case companies use some of the sustainability criteria as a minimum criterion which must be under control even before they consider suppliers to be potential candidates.

In terms of supplier selection process there are similarities between the theoretical and empirical parts. For instance, the description of the supplier selection process in company A is quite like the description in the theory part. All case companies considered that the beginning of the supplier selection process is the most important stage in terms of sustainability. By reflecting this information to the theory, we can suppose that the selection of the minimum criteria is very important for gaining sustainability. By comparing this to Cousins et al. (2008, 60) description of the supplier selection process the first stage of the process is called initial supplier qualification. Therefore, this stage is the most critical in terms of ensuring sustainability. Cousins et al. (2008, 60) also defined the minimum requirements for suppliers in this stage as case companies. According to De Boer's et al. (2019) process description the second stage illustrates the formulation of supplier selection criteria and minimum requirements. Nevertheless, the process description at the beginning of the process is crucial for sustainability. In terms of supplier evaluation stage, all case companies mentioned external services are very useful for evaluating suppliers. However, the theory did not introduce the external resources as an evaluation method. Therefore, the case companies provide a new implication compared to previous literature of evaluation methods.

According to this research, the categorization of the suppliers affects the monitoring level of sustainability. For instance, in the company B they see risks as an important factor. By reflecting this to the theory of Kraljic Portfolio Matrix high risk products are categorized as leverage items or strategic items (Gangurde & Chavan, 2016). Therefore, these products with higher risk might increase the sustainability requirements. In addition, in the company

C they highlighted differences in the importance of sustainability between product categories. For instance, some categories require detailed information about the origin of the product or raw material. Furthermore, volume and effectiveness are significant factors which impact the importance of sustainability. If we reflect this to the theory of Kraljic Portfolio Matrix we can see that the higher volume is typical for the leverage items (Canie'ls & Gelderman, 2005). In conclusion, the categorization of the suppliers helps to notice the need for increased monitor requirements. According to this study, leverage items are critical in terms of sustainability monitoring. All in all, case companies' monitoring methods were corresponding to those introduced in the theory part such as auditions, self-assessment questionnaires, and checklists.

Şen et. al. (2008) claimed that supplier integration levels have a relevant impact on both supplier selection process and the formulation of evaluation criteria. In this thesis the integration level of buyer-supplier relationship is deepened to also consider supplier monitoring level. Therefore, this study pointed out that the critical impacting factor is activity of the supplier which affects the sustainability monitoring requirements of suppliers. On the other hand, more active suppliers are probably more integrated with buyers and have closer relationships. By reflecting empirical findings to the theory, the more integrated relationships are more active which might increase the level of sustainability evaluation and monitoring. In conclusion, this study shows that the buyer-supplier relationship might impact on the supplier's monitoring level.

In terms of barriers for sustainability, the empirical findings and theory were at some point in line. In the theory chapter the most critical barriers incorporated the lack of resource availability and technology, lack of funds for green projects (Ruben, Nagapandi & Nachiappan, 2021). The lack of resources highlighted to be a most critical reason also in several case companies. In addition, the lack of knowhow pointed out to be a barrier by one case company. However, the theoretical description of the sustainability barriers was more encompassing compared to empirical evidence of the barriers. The reason for this difference was that case companies have not faced critical barriers for sustainability.

All in all, the empirical findings are mostly in line with previous theoretical results. However, some new aspects were provided by this study. For instance, the buyer-supplier

relationship impacts on the supplier monitoring levels. Moreover, this study showed the most important stages for sustainability in the supplier selection process. The results also support the fact that sustainability criteria have increased in companies. The empirical and theoretical evidence of this thesis also support the claim of increasing significance of sustainability.

5.2 Answers to research questions

The following chapter provides answers to the research questions. The answers are supported by theoretical and empirical findings. This thesis includes one main research question and two sub-questions.

What is the role of sustainability in supplier selection and evaluation?

The target of the first sub-question was to figure out what kind of role sustainability plays in selection and evaluation of suppliers. This research shows that the role of sustainability is significant in the supplier selection process. Firstly, the background of the traditional criteria was figured out in this thesis. Case companies seemed to have quite similar traditional supplier selection criteria. In other words, the baseline is the same between case companies. In terms of sustainable selection criteria, the importance is high and growing in case companies. Moreover, the theory of growing sustainable supplier criteria is supported by empirical evidence of the case companies which shows that sustainability criteria are included in minimum requirements for suppliers. This indicates the increasing importance of sustainability in the supplier selection process. In other words, the sustainable criteria have raised its importance beside the traditional selection criteria. However, this study shows that in the last stage the traditional supplier selection criteria are still more significant than sustainable criteria. The findings indicate that the role of sustainable criteria is critical in supplier selection and almost as important as traditional criteria.

However, the role of sustainability in supplier evaluation and monitoring in case companies have not so much importance. All the case companies highlighted the challenge of sustainability monitoring because the suppliers do not often verify their sustainability operations. This observation increases the criticality of suppliers' sustainability monitoring. In addition, the lack of the proper evaluation meters and monitoring methods complicate the

assessment process in case companies. The theory of monitoring methods includes corresponding procedures that case companies utilize. According to case companies, the most effective method to evaluate a supplier's sustainability is audition. However, this is problematic because auditions are very time-consuming, and it is not possible to audit every single supplier. For this reason, there is a need for more effective sustainability monitoring methods. Currently, buyers from case companies define the level of trust on suppliers and lean on a lot of supplier's promises. In conclusion, this study suggests that the role of sustainability in supplier evaluation and monitoring is critical. There is a need for deeper sustainability monitoring because it would help to overcome the challenge of verifying suppliers' sustainability actions. In conclusion, the role of sustainability is higher in supplier selection than in supplier monitoring.

This thesis forecasts that the role of sustainability will increase in the future. The empirical evidence from case companies supports this fact because sustainability has even become a necessity with suppliers in these organizations. This claim is also supported by the fact that case companies have minimum sustainability requirements that must be passed, and the number of sustainability requirements is estimated to increase. In addition, some of the case companies showed that there will be more legal sustainability requirements in the future. This will also raise the importance of sustainability. The previous literature also supports this claim that the role of sustainability will increase in the future. Sustainability might be a necessity in the future. This observation suggests that the role of sustainability is increasing, and its role is already high in case companies.

How to make sustainable supplier selection?

The first sub-question interprets the critical steps in the supplier selection process in terms of sustainability and gives answers to how companies can achieve collaboration with sustainable suppliers. Firstly, the beginning of the supplier selection process is the most important in terms of sustainability. The supplier selection process starts by identifying a need. At this point it is essential to think what kind of product is going to be supplied and what are the sustainability requirements in a certain product category. As case companies described the requirements differ between the products. Consequently, the findings of this thesis show there might be differences in sustainability requirements between different

product categories. The useful tool is to recognize product categories by using the Kraljic Portfolio matrix. Especially, the monitoring of sustainability must be precise with leverage items.

The second step of the process is most crucial for ensuring sustainability of suppliers. There the supplier selection criteria are formed. This stage includes background checks and buyers ensure that suppliers fulfill the minimum sustainability requirements. Especially, minimum sustainability requirements are very effective way to ensure certain level of supplier's sustainability. In addition, buyers can avoid later sustainability problems by using minimum sustainability requirements. However, buyers form the supplier selection criteria based on the traditional and sustainability requirements by considering the product type.

In addition, it is important that buyers consider all aspects of the triple bottom line in the formulation of the supplier selection criteria. As one case company described the company cannot be truly sustainable without considering all dimensions of the triple bottom line. For instance, safety, well-being, economical liabilities and impacts on nature are common sustainability criteria which companies are utilizing.

After supplier candidates have passed the minimum requirements, the evaluation begins. Depending on the wanted sustainability level buyers cannot focus only on traditional criteria such as prices. They must also pay attention to sustainable criteria and emphasize them enough. All in all, the beginning of the supplier selection process and minimum sustainability requirements ensures that supplier candidates have accepted the required sustainability level. In other words, those help to seek sustainable suppliers.

What are the challenges in monitoring and evaluating suppliers' sustainability?

The second sub-question aims to interpret how supplier monitoring and evaluation changes when the focus is on sustainability and what kind of challenges it brings. All the case companies described the monitoring of sustainability to be more challenging than monitoring of supplier's general actions. The most obvious challenge is to verify the supplier's

sustainable operations. In other words, it is hard to figure out what is false information and which procedures suppliers have implemented in terms of sustainability. The lack of proper meters and methods of sustainability monitoring create a challenge. Self-assessment questionnaires are a very used method but those rely on only suppliers' words. Auditioning is the most suitable method for monitoring sustainability according to this thesis and it gives reliable results of supplier's sustainability levels. However, the problem with auditioning is that it is very time-consuming, and companies are not able to audit all their suppliers. In addition, long supply chains create their own challenge. It is more difficult to monitor suppliers at a deeper level in the supply chain. These challenges complicate the supplier's sustainability monitoring and decrease the sustainability's role in the evaluation process. In other words, these challenges explain why supplier's sustainability monitoring has not so much emphasis. If organizations find proper methods to monitor supplier's sustainability effectively the role of sustainability would probably increase in monitoring.

5.3 Further research

Sustainability has been a growing trend for a long time. The significance of sustainability will be growing in the future. This thesis suggest that the suppliers are in a critical role in terms of organization's sustainability. Hence, research of sustainability is useful and especially in the field of supply management this topic is crucial. The results of this thesis highlighted the challenge of supplier's sustainability monitoring. Consequently, future research could investigate the different supplier monitoring systems and methods. It is crucial that companies will find proper methods to evaluate and monitor suppliers' sustainability.

According to the results of this thesis, the audition is the best method to evaluate suppliers' sustainability. However, the problem is that buyers cannot audit every single supplier. In other words, there is a need for more effective and compelling methods which verify suppliers' actions. In addition, one opportunity for future research is to explore complexity of the supplier selection process. In the future the supplier selection process will be even more complicated because of the increasing number of selection criteria. For this reason, it would be useful to identify different supplier selection methods and increase the

understanding of the supplier selection process in the future. All in all, sustainability will be a prominent and crucial research topic in the future as well.

5.4 Conclusions

The worldwide phenomenon of sustainability is gaining more and more attention. Consequently, knowledge of sustainability is increasing in many organizations. Moreover, many organizations want to ensure that their stakeholders act in a sustainable way. Suppliers are especially critical and challenging actors in complex organizations. This thesis suggest that the role of sustainability is very important in the supplier selection process because organizations can avoid later sustainability risks by ensuring supplier's competencies to act in a sustainable way. The supplier evaluation and monitoring are critical for organization's sustainability. This thesis suggests that the role of sustainability is not so highly emphasized in monitoring. However, the study shows that the challenge is to verify suppliers' sustainability actions which increase the importance of the monitoring. Consequently, if companies want to be sure of their supplier's actions they must increase the level of monitoring. Currently, they have high trust in suppliers' words. In conclusion, the role of sustainability will increase in the future, and it will be more critical. This thesis shows that suppliers are crucial actors in organizations 'sustainability and organizations cannot forget their supply chain's sustainability.

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Appendix

General questions

1. What is your role in the organization?
2. What are you responsible for in the organization?
3. What kind of supplier base does your company have?
4. Where the suppliers are located geographically in general?

Theme 1. Supplier selection

5. What kind of supplier selection criteria are you using and what are the most common and important criteria?
6. Which factors affect the formulation of supplier selection criteria?
7. Do you have minimum sustainability requirements which must be fulfilled that supplier is even considered as a potential candidate?
8. What kind of other sustainability requirements do you have for suppliers?
9. How important sustainability criteria are beside the traditional supplier selection criteria?

2. Sustainable supplier selection

10. Which domain of sustainability has the most emphasis: environmental, social or economic in supplier selection?
11. Is it more important to ensure sustainability for certain products or services? If it is, what kind of products/services and why?
12. Does the form of buyer-supplier relationship (for example the integration level) affect the sustainability requirements and monitoring?
13. What motivates you to collaborate with sustainable suppliers?
14. What kind of supplier selection process do you have and what are the critical steps in terms of sustainability in the supplier selection process?
15. What are the most suitable methods for evaluating sustainability when potential suppliers are compared together?

Theme 3. Evaluation and monitoring

16. What kind of methods and procedures do you have for supplier evaluation and monitoring? If you do not have one, why?
17. What supplier monitoring method is the most suitable for monitoring sustainability?
18. Could you describe the monitoring of supplier's sustainability compared to monitoring of supplier's general operations?
19. Have you faced any challenges in supplier's sustainability monitoring?
20. If there is a situation where a supplier has a problem with sustainability, how do you handle the situation and solve the problem?
21. Does your company or your suppliers have some barriers for sustainability?