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Procurement practices supporting sustainable upholstery textile buying

Case: Lauritzon's

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ABSTRACT

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Textile industry's sustainability issues have received a great deal of attention in recent years as textiles generate large amounts of emissions and carry social problems. The largest sustainability concerns happen in the manufacturing of textiles. Thus, a company who buys textiles must be aware of the sustainability issues of their suppliers' as well as the textiles they buy and be able to manage them. This study aims to find out what procurement practices an upholstery textile company can use when purchasing sustainable textiles. Sustainability in textiles is not unambiguous which is why the study assists to understand what the environmental and social sustainability aspects of textiles are. Furthermore, it helps to critically evaluate the sustainability of suppliers and textiles. The study is made as a qualitative case study in which the case company representative and seven suppliers around the world were interviewed. The suppliers were textile manufacturers and editors.

The study introduces many procurement practices that the case company can use to support their sustainable purchasing. From all of the practices, supplier collaboration and development were the ones highlighted in both theory and empirical part. The results show that there are many things that need to be considered when designing sustainable textiles. Furthermore, especially recycled textiles receive attention in the study. According to the results, the case company must decide their own sustainability criteria, thus what is sustainable enough for them. Challenges found in purchasing of sustainable textiles are complex supply chains, material availability and knowledge about sustainability issues.

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Tekstiilialan vastuullisuus on saanut paljon huomiota viime vuosien aikana, sillä tekstiilit tuottavat suuren määrän päästöjä ja kantavat sosiaalisia ongelmia. Suurimmat vastuullisuus ongelmat muodostuvat tekstiilien valmistuksessa, minkä vuoksi tekstiilejä ostavan yrityksen on tiedostettava toimittajaan sekä tekstiiliin liittyvät vastuullisuuskysymykset ja hallittava niitä. Tämän pro-gradu tutkielman tarkoituksena on selvittää mitä hankinnan käytäntöjä verhoilutekstiilialalla työskentelevä yritys voi hyödyntää vastuullisten tekstiilien ostamisessa. Vastuullisuus tekstiileissä ei ole yksiselitteistä ja tämä tutkimus pyrkii auttamaan ymmärtämään mistä kaikista ympäristö- ja sosiaalisen vastuun aspekteista se muodostuu. Tutkimuksen tarkoituksena on myös avustaa kriittisesti tarkastelemaan toimittajien ja tekstiilin vastuullisuutta. Tutkimus on toteutettu laadullisena tapaustutkimuksena, jossa haastateltiin yrityksen edustajaa ja heidän seitsemää toimittajaansa ympäri maailmaa. Haastateltavat toimittajat olivat tekstiilien valmistajia sekä jälleenmyyjiä.

Tutkimus tuo esiin monta eri hankinnan käytäntöä, joita yritys voi hyödyntää vastuullisessa ostamisessa. Käytännöistä eniten nousee esille toimittajayhteistyö ja toimittajien kehittäminen. Tulokset osoittavat, että vastuullisia tekstiilejä suunnitellessa on otettava monta asiaa huomioon. Vastuullisista tekstiileistä erityisesti kierrätetyt tekstiilit saavat tutkimuksessa painoarvoa. Tuloksien pohjalta on suositeltavaa, että yritys päättää mitkä ovat heidän vastuullisuuskriteerinsä, toisin sanoen mikä on heille tarpeeksi vastuullista. Haasteita vastuullisten tekstiilien ostamisessa aiheuttavat monimutkaiset toimitusketjut, materiaalien saatavuus ja ymmärrys vastuullisuuteen liittyvistä asioista.

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1. INTRODUCTION

The textile industry is one of the most unsustainable industries known in modern times. Addressing environmental challenges is important for textile industry since it accounts for 10% of total carbon emissions and is responsible for about 20% of industrial water pollution (Colin et al. 2016). At the same time when the production of textiles has increased, the awareness of the environmental and social issues associated with textile production has also risen. As a result, numerous organizations and initiatives have emerged using sustainable standards, labels, audits, certificates, or strategies to enforce sustainable value creation. (Gruère 2013) Key challenge of a textile company to become more sustainable is in its design phase. The decisions made in design affect the whole product, concerning quality, material, appearance, manufacturing, and costs. It has a critical influence on translating sustainability principles into the company's value proposition and supply chain. (Todeschini et al., 2017) Thus, textile companies need to make active decisions to go towards sustainability in design and decide to buy sustainable materials from their suppliers.

There has been growing interest about sustainability in procurement and sustainable supplier management along with the amount of research papers that have increased regarding the issue in the last decade. Behind the increased interest is that companies have been required to do more than ever to address the environmental and social issues of their suppliers because of drivers such as customer demand and regulations (Choi & Ng 2011; Giunipero et al. 2012). As a result of the demand to be more sustainable from multiple stakeholders, companies have found necessary to use practices in their operations (Vahidi, Torabi, & Ramezankhani 2018) Moreover, the use of the practices have proven to have positive impact on addressing suppliers' sustainability issues. (Gimenez, Sierra & Rodon 2012) Even though the interest and literature towards sustainable buying and procurement has risen, the practices to use have been inconsistently defined in different literature and there is no mutual agreement on what these practices are (Hong, Zhang & Ding 2018). Furthermore, this makes it noticeably hard for companies to understand how they should manage the sustainability issues of their suppliers and with what practices.

Sustainable procurement centres around materials used in the product, where they come from, who has made them, how they are transported and finally how they are disposed of. In summary, sustainable procurement takes into account the whole product life cycle. Thus, the purchasing function holds an important position in “greening” the organization and therefore sustainable purchasing strategies have significant implications for the supply chain structure. (Genovese et al. 2013) Textile companies’ s supply chains are globally dispersed and have characteristics of having strong impact on social and environmental issues. (Perry & Towers 2013) According to Niinimäki (2015) majority of textile suppliers come from undeveloped countries that does not have legislation to support environmental and labour aspects which creates challenge for textile companies to manage their sustainable supply chain. Therefore, textile companies should utilize practices, which is why this study is looking at what are these practices in procurement and how to use them in the upholstery industry.

Sustainable textile and adopting them in the textile industry have been in the interest of research. There is a lot of certifications and textiles that are called sustainable but only little criticism about how effective and sustainable these are. Companies must do intensive research when deciding to go towards buying sustainable textiles because there are a lot of misleading eco-labels, misinformation and textile certificates that might not be the best when considering true sustainability (Diekel et al. 2021). In textile industry it has been easy to label products as sustainable without them truly being one, but this has been changing when consumers have become more aware of the intensive problems in the industry. Thus, companies are being asked to be more transparent about their sustainable products. It can be concluded that companies need sustainable procurement practices to support their decision to design and buy sustainable textiles. Thus, this study is also trying to find out what is sustainable textile and what might be the challenges in designing them.

1.1 Theoretical framework

The theoretical framework introduces two main topics: sustainability in textiles and sustainable procurement. The theoretical framework of the study is illustrated in the Figure 1. The concepts that are presented in the theory are sustainable procurement and practices,

sustainable textile, and sustainable textile design, with the underlying theme of textile industry and sustainability throughout the study. Sustainable textiles are looked at from the raw material to the distributor point of view. Furthermore, sustainability is divided into social and environmental sustainability.

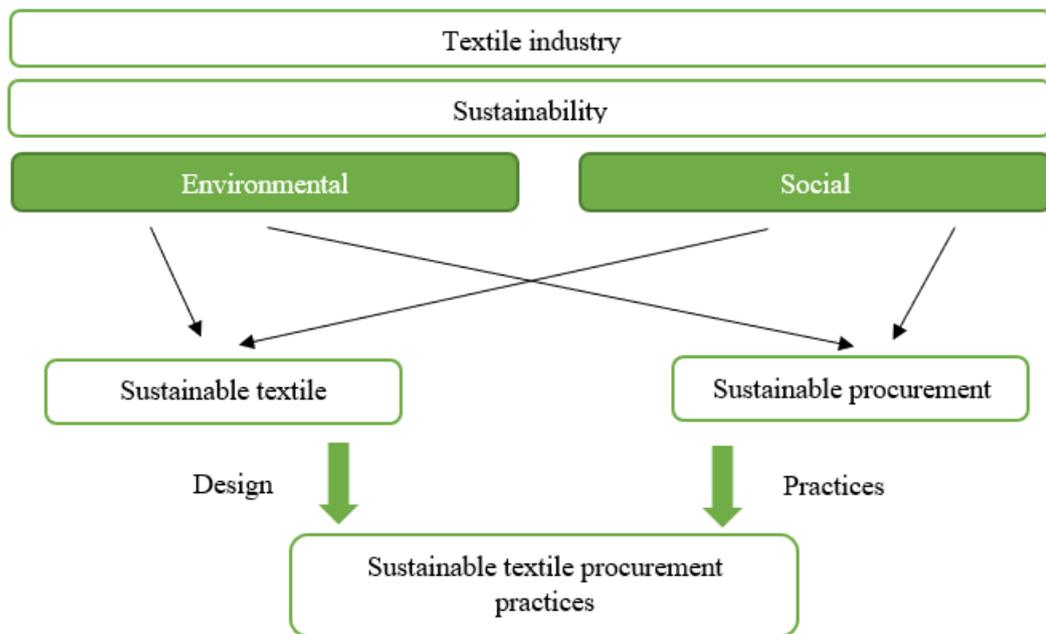


Figure 1. Theoretical Framework

1.2 Research objectives and questions

Due to the nature of the textile industry and the importance of adopting sustainable procurement in a textile company, this study aims to find out how a upholstery textile company can use sustainable procurement practices when transitioning towards buying more sustainable fabrics. The sustainability issues of upholstery industry have become increasingly important in the last years, but it has not been studied as much as the apparel industry (Dangelico et al. 2013). Furthermore, sustainable textile supply chains have been studied intensively, but there is still a research gap of current sustainability issues relating to sustainable supply chain management (Shen, Dong & Perry 2017). This study is conducted

as a qualitative study since textile industry's supply chains and sustainability are both complex and current topics.

The study will introduce sustainable procurement practices that help the company to succeed overcoming the current sustainability challenges and become more sustainable in its buying actions. Since sustainable procurement supports the decision to buy sustainable products, more specifically the sustainable product design (Todeschini et al., 2017), this study will define the elements of sustainable textile. Defining the elements helps the company to decide if a fabric is truly sustainable. Furthermore, there can be challenges when going towards designing these sustainable textiles, which is why this study is also trying to define what they might be. It is very important that the suppliers who provide sustainable products are themselves also truly sustainable. Thus, this study is trying to find out how to ensure suppliers' sustainability. Based on these the research questions are:

Main research question:

How should an upholstery textile company use procurement practices to support buying sustainable textiles?

Sub-research questions:

What are the sustainability elements of upholstery textiles?

How to ensure supplier's environmental and social sustainability?

What are the challenges of going towards designing of sustainable textiles?

1.3 Definitions and key concepts

Sustainability is defined by World Commission on Environment and Development (1987) as "Economic and social development that meets the needs of the current generation without undermining the ability of future generations to meet their own needs". Important

sustainability concept for companies is Elkington's (1994) triple-bottom line which recommends that companies should focus on social and environmental issues as much they do for profits.

Social sustainability is a broad concept and there has been debates on how to define it. Polèse and Stren (2000) has defined social sustainability as a development that is possible to happen by balancing the evolution of civic society, and furthermore this will result in a more thriving environment. Vallance, Perkins and Dixon (2011) stated that to create social sustainability, people's needs have to be met, changes have to adapted in order to achieve bio-physical environmental goas and the socio-cultural characteristics have to maintained.

Environmental sustainability has been noted to be easier to define than social, since it is also measurable. Glavic and Lukman (2007) has described the environmental sustainability principles as environmental performance by minimizing the use of hazardous or toxic chemicals, resources and energy. Terms such as recycling, renewable resources, reuse, repair, and recovery are linked to environmental sustainability.

Sustainable textile is a product where all material and process, inputs, and outputs, are healthy and safe for humans and environment, in all phases of the product life cycle. All energy, material and process inputs are either renewable or recycled. The textile materials can return safely to natural systems or industrial systems and all stages of the life cycle support the reuse or recycling of material. In addition, all life cycle stages support and enhance social well-being. (Muthu, 2014, 1)

Sustainable procurement can be defined as the process which company buys products in a way that there is least impact on society and environment throughout the whole life cycle of the product (Meehan & Bryde 2011). Furthermore, sustainable procurement tries to minimize the environmental impacts of selected product or service (Berry 2011, 26).

Sustainable procurement practices are practices that companies can use to reduce the environmental and social impact of their own and their suppliers' goods, services and activities. The sustainable practices include such as educating suppliers, assessing suppliers and collaborating with suppliers. (Walker & Phillips 2009)

Sustainable design is designing products in a way that the products whole life cycle and environmental aspects are considered in all stages of the process. It also strives to produce products that create the lowest possible environmental impact throughout the product's life cycle. (Glavic & Lukman 2007)

1.4 Structure of the study

The study is divided into six chapters. The first chapter gives background for the research and introduce to the topic. The theoretical part is divided into two parts: sustainable textile and sustainable procurement. The first part focuses on the sustainability aspect of textiles, more specifically before distribution to customer. The second part of the theory introduces to sustainable procurement, and furthermore practices companies can utilize to be more sustainable in their supply management. The fourth chapter presents the design of the study and introduce the case company. The fifth chapter is the empirical part that focuses on the qualitative study. The sixth chapter gives results for the research questions, suggests a plan of action for the company and discusses about limitations of the study. The final chapter is the summary of the study and its results, and it also gives suggestions for possible future research.

2. SUSTAINABILITY IN TEXTILES

This part of the study introduces to the sustainability concept and furthermore dive more into environmental and social issues in textile industry from manufacturer to distributor point of view. Moreover, sustainable textiles and designing them are discussed. Finally, the characteristics of interior textiles are introduced.

2.1 Sustainability concept & drivers

There are many views and definitions for sustainability. The most used definition has been provided by the World Commission on Environment and Development (1987) that defined sustainability as economic development that “meets the needs of the present without compromising the ability of future generations to meet their own needs”. There can be found many terms for describing companies’ sustainability in literature. These terms are such as responsibility, corporate responsibility and sustainable development. In procurement and in supply chain, commonly used sustainability terms are sustainable supply chain management (SSCM), green procurement and sustainable procurement.

This study uses the terms sustainability, sustainable procurement and practices and SSCM to give more general view and not to confuse with too many definitions. In addition, although the study is focusing on social and environmental aspects of sustainability, it is important to present sustainability concept as a whole to understand where the individual aspects come from and how they are linked. Economic sustainability is excluded because the study is focusing on mostly sustainability issues that happen in the manufacturing of the textile product.

The first-time sustainability concept started to gain attention was during the environmental and social movements in 1960’s and 1970’s. During the 1980’s the research about company sustainability was towards “greening” the company. In this period, many leading companies started to change their position from ignoring or resisting environmental pressure, to

embracing and profiting from them. (Starik and Marcus 2000) In the beginning of 1990's the focus shifted to "green marketing" to gain or to maintain competitive advantage (Stone & Wakefield 2001). In the 21st century, generally the sustainability issues moved more into the supply chain. The research began to focus on product life cycle during material selection, impact of sustainable purchasing on supplier selection, waste management and regulatory compliance. (Giunipero, Hooker & Denslow 2012)

In 1994 Elkington (1994) introduced the famous and much used idea of triple bottom line (TBL) of people, planet and profit, that is a framework for companies to use for managing the sustainability of the company. The concept states that if the company does not focus on all aspects of TBL, it will not succeed in long term. Companies should be able to create profit and at the same time protect the environment and people. Thus, true sustainability is when all three pillars of TBL meet (Figure 2). Carter and Rogers (2008) have notably introduced the concept of Triple Bottom Line (TBL) with supply chain with building on the TBL concept by integrating the three dimensions of sustainability into the supply chain, that are environmental, social and economic. Seuring and Muller (2008) expanded the idea by taking goals from all three dimensions of the TBL into account, which have pressure from external drivers such as customers and market.

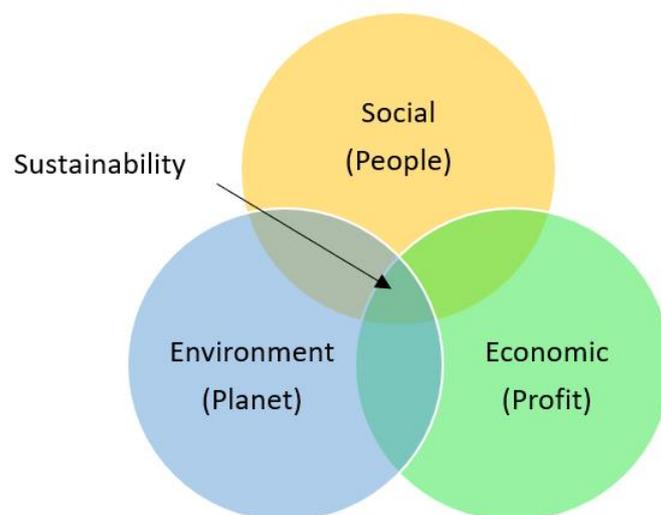


Figure 2. Three aspects of sustainability

There is nowadays a lot of motivation for companies to start being more sustainable, especially in the textile industry. The lack of sustainability in textiles have been highly in the public for the last decade and the pressure for companies has risen to act on it. Consumers and other external drivers have started demanding more environmentally friendly products. Green products are proven to be economically profitable which is why many companies fall into greenwashing that is poor environmental activities and positive communication about them. Green washing is misleading to consumers in regards of the environmental activities of the company or the environmental aspects of the product or service. (Delmas & Burbano 2011) The transition towards sustainable or circular business models have presented many problems in the textile industry. Problems include growing sales of textiles, declining recycling rates, resource pressure, pollution and negative social image (Warwas et al. 2021).

According to Tachizawa, Gimenez and Sierra (2015) drivers toward sustainability can be categorized as coercive such as regulations and standards, and non-coercive such as customer demand and competitors. Giunipero et al. (2012) on the other hand have divided drivers for sustainability as involvement of top management, government regulations, financial benefits, competitive advantage, ISO 14001 and customer demand. According to their study the highest driver towards sustainability inside companies was top management initiatives and compliance with laws and regulations. On the other end, the lowest driver was ISO 14001 and government incentives because not all companies have implemented the environmental system and did not see it as a priority, and they felt that they already complied with government regulations and did not need to drive sustainability efforts more.

Despite the external pressure for companies to become sustainable, many of them are not yet fully one. It has been acknowledged that the environmental and social dimensions need equal attention, yet many companies are lacking on them or more focused on the other (Sharma & Rood 2003). Gimenez et al. (2012) also argue that the definition for sustainability is vague, and it provides only little guidance on how companies should identify present and future needs and to meet them with technologies and resources, and according to them there is a gap in literature that combines environmental and social corporate aspects. Furthermore, according to study made by Gimenez et al. (2012) internal environmental programs, such as

focus on sustainable procurement, really does have positive impact on the three pillars of the triple bottom line.

2.2 Environmental issues

Textiles are known for having significant environmental impact. Textile industry alone has estimated to account for 10 % of total carbon emissions and is responsible for about 20 % of industrial water pollution (Colin et al, 2016). Textile production has high use of water, energy and chemicals which all have negative impact on the environment. Textiles can roughly be divided into natural fibres, synthetic fibres (man-made) and recycled fibres. (Fathy 2016) Every kilogram of textile that is produced creates approximately 15kg of carbon emissions (Elander & Palm 2015). The environmental impacts of textiles happen mainly in the manufacturing stages that generally includes fibre production, yarn spinning, fabric production, wet treatment (dye), sewing and finishing (Roos et al. 2015). Figure 3. below shows the environmental impact of textile from raw material harvesting to the distributor. As seen from the figure, every part of the process will at least create carbon emissions (energy). To note, the figure is excluding the product use and recycling since this study is focusing on aspects before distribution.

Fresh water is becoming scarce in many places and textile production has high impact on water use and water pollution. Textile wet processing, such as dyeing, printing and finishing is used in almost all textile products in order to create colours, patterns and special characteristics. Wet processing has significant environmental impact because a lot of chemicals are used, which is why the process is highly criticized. Furthermore, it is a major source of toxic emissions since spinning of yarns and weaving/knitting of fabrics often rely on fossil fuel energy, hence create CO₂ emissions. The choice of wet treatment depends on the material and type of fabric intended to design. For example, white and light-coloured materials need bleaching, and therefore creates better dyeing result but on the other hand they need more chemicals and water in the dyeing process. (Chen & Burns 2006; Roos et al. 2016)

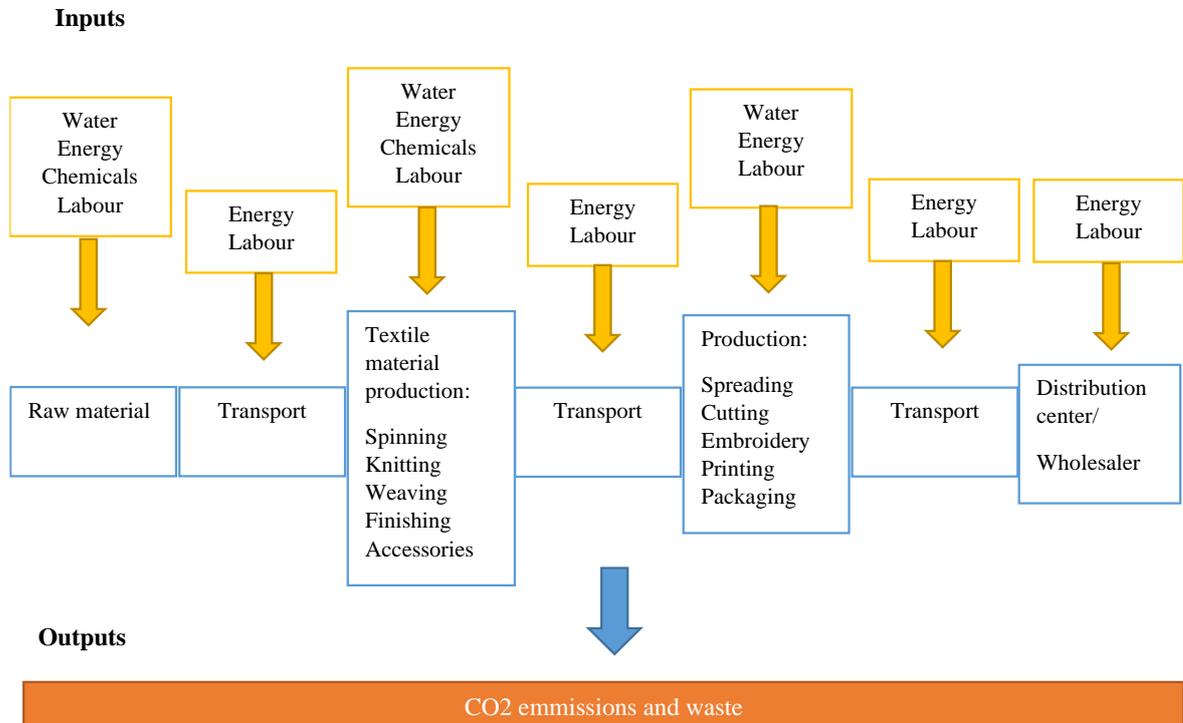


Figure 3. Textile product environmental impact (modified: Eryuruk 2012)

The most effective way to affect water pollution is wastewater treatment. Reuse of the cleansed water can also lower the use of fresh water. Some industrialized countries have achieved wastewater treatment coverage of nearly 100%, but still in some developing countries it remains below 5%. (UN WWDR 2017) Moreover, there are more environmental methods for wet treatment. Terinte et al. (2014) has compared regular dyeing methods versus spin-dyeing. The study found out that the use of water and the number of emissions was significantly lower using spin-dyeing, with carbon footprint of 60% lower than regular dyeing. The total of pigment needed is also 20% of the normal dyeing required, which lowers the use of chemicals. Yet, spin-dyeing is used very little in the industry and the problem may be that it can be used with only colours that have a large demand such as black and brown

Cotton is a fibre that is known for having high environmental and social impact, thus cotton is used in many literatures as an example of how much negative environmental impact textile production creates. Cotton is the second largest produced fibre in the world after polyester

and accounts for approximately 25% of global insecticide consumption and approximately 11% of the world's pesticide consumption. Cotton also uses large amount of water and evidently requires 7000-29000 litres of water to produce 1kg of cotton fibre which is the same amount that is required only for one pair of jeans. Cotton is produced mainly in undeveloped countries in which the water and land for food is reduced since large amount of it goes to producing cotton. (Clay 2004, 286;294)

Polyester and cotton are the most used fibres. According to Kalliala and Nousiainen (1999) the comparison between the fibres is theoretical since they have specific characteristics, which is why one fibre is not capable of replacing the other one. Though, it is important to understand the environmental effects of both. According to their LCA study generally the production of 1 kg of polyester fibre consumes 60% more energy than cotton. On the other hand, the production of polyester requires only 0.1% of water needed to produce cotton fibre. Thus, if looking only the numbers it could be said that polyester creates less environmental impact compared to cotton. In addition, polyester is highly recycled material by using materials such as PET bottles to create recycled polyester (Chen & Burns 2006).

Manufacturers can work towards more environmentally sustainable production by adopting environmentally friendly working methods such as carefully selected dyes, optimize dye baths, chlorine-free bleaching techniques, low-formaldehyde finishing methods and selection of pesticide free materials (Niinimäki 2006). To tackle the issue of textile's environmental impact, also new non-toxic dyes and chemicals have been developed, in addition to biodegradable ones (Hole & Hole 2018). Furthermore, textile recycling lowers significantly textile's environmental impact when new raw materials are not needed to be sourced and less water is required in production. However, textile recycling is still in its early stages and there are a lot of challenges in closing the loop for textiles. (Harmsen, Scheffen & Bos 2021)

2.3 Social issues

Social issues in textile production are very well known and have been in the interest of recent research since most studies have been more focused on textile's environmental impact. Textile supply chains have large number of partners, are relatively long and generally located in undeveloped countries. Undeveloped countries do not have the same legislation to support environmental and labour aspects which create challenges for companies to have suppliers that provide good working conditions. (Niinimäki 2015) The SA8000 standard for worker's rights or code of conduct can be used as a tool for ensuring and implementing safe working environment (Berry 2011, 146). For example, the social impact of cotton includes things such as severe health problems from harmful chemicals, especially in countries that have weak or non-existent regulatory systems (Clay 2004, 292).

Social issues can be divided into three main areas that are wages, working hours and working conditions. Textile industry has been scrutinized for using cheap labour across the globe and not paying enough attention to social issues, especially in South Asia where low-cost labour is important for industry competitiveness. It has become apparent that despite the development and management tools, the issues are hard to tackle, and in many cases, environmental issues overrule them. Working in the textile industry opposes workers to many hazards. For example, people who work in spinning of cotton are exposed to large amount of cotton dust and due to long exposure, they can start having health problems. Dyeing the textile with harsh chemicals also creates problems in workers' health. Especially people who work in dyeing, printing, and finishing are exposed to chemicals. (Annapoorani 2016)

The social issues regarding supplier's sustainability have been understudied. People and organizations are aware of social issues, but manufacturers and retailers have difficulties to tackle the issue, particularly due to subcontracting and high pressure for cost reduction. In addition, demand for increase in production from supplier's side and inadequate or enforced labour can lead to ethical practices. (Martin-Ortega, Outhwaite & Rook 2015) Social standards are important especially in the textile industry in which many social and ethical

issues arise and supply chain structures are complex. It has been found out in various research that supplier's social risk can be lowered with supplier collaboration and supplier assessment. (Köksal et al., 2017). To note, the largest area of social certifications occurs in China where inspections and working conditions are weak and no unions for workers exist (Mueller, Santos & Seuring 2009).

Freise and Seuring (2015) has identified that the management of social issues in the textile industry includes practices such as code of conduct, audits, cooperation with multi-tiers or offering incentives to the suppliers. Common social risks in the textile industry that are mitigated with these practices include child labour or extensive working hours. The use of these practices is more talked about in their own chapter. According to study made by Warwas et al. (2021) textile companies can be called socially responsible if they actively promote sustainable behaviours and attitudes also among consumers. According to them it indicates that they aptly identify the sustainability issues in the industry. Furthermore, Todeschini et al. (2017) has introduced socially sustainable business models in textile industry that include, sweat shop free working, locally sourced and fair trade. The concept for sweatshop free includes transparency and not outsourcing from countries that have low-cost labour. Outsourcing locally is better option that also stimulated local communities and lowers the environmental impact of transportation. Finally, companies should support fair trade suppliers that aims to offer fair wages to all employees.

2.4 Sustainable textiles

Sustainable textile is hard to define as a single idea. All textile production creates emissions and require water and energy in production, which is why companies need to decide which is sustainable enough for them. Some scholars define sustainable textile by life cycle view or recyclability (Muthu, 2014, 1), but there are many aspects and ways of doing things. Some have furthermore defined sustainable textiles as recycled textiles and eco-textiles such as organic textiles (Roos et al. 2015; Eryuruk 2012), however this is just a one way of classifying sustainable textiles. Moreover, TextileExchange (2021a) has introduces "preferable textiles" that are considered as better alternatives to regular textiles. Thus, this

study is looking at textiles that are characteristically classified as sustainable. Furthermore, the term “sustainable textile” refers mostly in research to textile’s environmental impact rather than social.

Kääriäinen and Niinimäki (2019) have presented five potential pathways towards sustainable textiles which are: transforming, reinventing, biofabrication, recycling and designing new materials. The first, transforming, focuses on how natural materials or industry/agriculture side streams are or will be transformed into textiles. One example of this kind of renewable raw material is cellulose, which is considered sustainable, renewable, and multifunctional. Other cellulose based man-made fibres are modal, cupro and lyocell. Cellulose is said to be a great material due to its abundance, biodegradability, recyclability and chemical tunability (Kääriäinen & Tervinen 2017). Reinventing refers to traditional textile materials, production and how the materials could be used in a new way. Materials such as hemp, linen and nettle are traditional sustainable textile materials but there is potential to produce them in more sustainable manner eg. locally in Scandinavia. Designing new materials refers to rapidly growing field of biotechnology in which new materials can be developed using various technologies such as genetic engineering. (Kääriäinen & Niinimäki 2019) Recycled textiles will be discussed in its own chapter since it is seen one of the most important pathways towards sustainable textiles.

2.4.1 Recycled textiles

According to Roos et al. (2015) recycling is the method we must use for textile production to become sustainable and to stay in the planet’s boundaries. Recycling refers to reuse of materials in a way that they are never considered to be waste (Ribul, Goldsworthy & Collet 2021). There are many recycling methods for textiles that are introduced in Table 1. Textile recycling routes can be the combination of different methods. The recycled material is generally pre- or post-consumer textile waste that is used in new textile or non-textile products. Also, non-textile material can be recycled into textile fibre such as PET bottles that is commonly used for recycled polyester. (Roos et al. 2015) A wide range of different fibre combinations is used these days, which creates difficulties in recycling fabrics. Commonly

the blend is cotton with few percent of elastane or polyester (PET). There are possible ways of recycling blended fibre, but the right method must be found when recycling the product. (Harmsen et al. 2021)

Mechanical recycling can be done to any kind of textile commonly through shredding and cutting the textile (Ribul et al. 2021). Before shredding the textile, accessories need to be removed which often is done by humans. One of the limits of the method is that fibres become shorter, and their strength and quality reduces. This makes some fibres impossible to have closed-loop recycling process, for example cotton is a fibre that needs also virgin cotton added to it in the process. Wool on the other hand does not need any virgin material added to it when mechanically recycled the first time. (Le 2018) Other recycling method is thermal recycling that is used for synthetic fibres which are first melted and then they can be used for re-spanning into new fibre. This recycling method is used only for pure synthetic fibres such as nylon 6, polyurethane, elastane and polyamide 6. However due to high cost and contaminants it is not widely used method. Chemical recycling provides the most opportunities for keeping textiles in the loop. (Ribul et al. 2019) This is still in the process of developing, but many innovations that could solve chemical recycling has been invented.

Table 1. Recycling methods and typical materials for them (Kääriäinen & Niinimäki 2019)

Recycling method	Material
Chemical recycling	Cotton, cellulose, polyester and their blends
Thermal recycling	Polyester
Mechanical recycling	All materials pre- and post-consumer textile waste

When considering true sustainability, recycling processes have also negative impacts to environment. Mechanical recycling uses the least amount of energy with only about 0.11 MJ/kg totally. Chemical recycling on the other hand uses about 12 MJ/kg when looked at data received from recycling of polyester. Still, it is much less than virgin polyester production that can amount as much as 100 MJ/kg. (Schmidt et al. 2016) Thus, recycling of textiles creates many more benefits than just the reduced amount of energy. There are multiple benefits on recycling such no new hazardous waste or harmful by-products are

created and there is reduction of polluting and energy intensive processes in textile manufacturing. (Turukmane, Gulhane & Daberao 2018)

Polyester is a fibre that is mostly recycled mechanically from post-consumer PET. The market share of chemically recycled polyester is still very low, but it is expected to grow in the coming years. The key challenges in chemical recycling are related to costs, technological challenges, feedstock availability and energy use. Most of the recycled polyester suppliers come from India, China and USA. The amount that is currently recycled is still very low compared to traditionally produced cotton and polyester. The market share of recycled polyester was in 2020 only 15% which is 4% more than in 2010. The increasing demand of post-consumer bottles has also increased in other industries as well that utilize them. Thus, textile to textile recycling is important to ensure future feedstock for the rPET textile industry. The market share of mechanically recycled cotton is as low as 1% of global cotton market. (TextileExchange 2021b)

Radhakrishnan et al. have (2019) concluded the advantages and disadvantages of using recycled polyester. According to their study, recycled polyester has almost the same properties than traditional polyester and is also reusable. Though, each time the polyester is recycled its quality will decrease and some quantity of virgin polyester will have to be blended into the fabric. Thus, when polyester is blended into other fibres it will be difficult to recycle. The advantages and disadvantages that are concluded about recycling polyester are presented below in Table 2. In addition, the standardization of recycled material can be affected by the availability of the recycled waste and thus it can create problems in repeatability. (Todeschini et al., 2017)

Table 2 Advantages and disadvantages of recycling polyester (Radhakrishnan et al. 2019)

Advantages	Disadvantages
Prevents plastic pollution	Polyester blended with other fibers are hard to recycle
rPET has almost the same properties than virgin polyester and is reusable in the manufacturing stream	The material gets decreated each time it is recycled and has to be used for low quality products or mixed with some quantity of virgin polyester
LCA prove that there is a reduction of carbon emissions and prevention of toxic emissions	PET bottles leach antimony which causes cancer
Promotes research for developing new technologies for closed-loop supply chain	Contribute to microfiber pollution in ocean water bodies
	rPET need cholire based bleaching since the base colour of the raw material varies
	Raw material colour variation leads to inconsistency in dye shades. Redyeing follows in high water, energy and chemical use

Recycled textiles need support from designing the textiles towards recycling. The designing aspects are further talked about in its own chapter.

2.4.2 Eco-textiles

Eco textiles are made from environmentally friendly and sustainable material. Consideration must be given to the product's whole life cycle and its impact on the planet. (Eryuruk, 2012) There are many textiles that fall into eco-textile category and this study is introducing the most common ones such as organic textiles, better produced natural textiles and natural textiles that can be called "eco".

Organic textile fibres are produced without chemical fertilizer, pesticide, and genetically modified seeds with the certification of organic textile processing. Organic fibres are generally classified as natural fibres. To produce organically, it requires much more time, labour, care and special production areas unlike conventional fibres. Organically grew and processed fibre does not guarantee that there are no toxic chemicals since the textile is also wet processed after the harvesting. Thus, Global Organic Textile Standard (GOTS) takes into account the whole production of organic textile, including wet processing. Organic textiles have positive environmental and social sustainability impact which includes

pollution prevention, no use of harmful chemicals, decrease consumption of water, soil and energy, higher workers safety and decrease of waste. Natural fibres from vegetables and from animal are such as cotton, linen, hemp, jut, wool, mohair, cashmere and silk. However, organic production has not significantly increased though it is noted to be more sustainable. (Uygur 2017)

The most known organic textile is organic cotton since conventionally cotton production uses high amount of chemicals, water and energy. Organic cotton on the other hand uses natural fertilizers such as compost. Comparing the environmental impact of organic and conventional cotton, organic cotton production creates on average 0.98 kg CO₂ equivalent/ 1 kg cotton fibre when conventional cotton creates on average 1.81 kg CO₂ equivalent/ 1 kg cotton fibre. Organic cotton also uses 91% less fresh water than regular cotton. Organic cotton thus has significantly lower environmental impact. Most of the organic cotton fibre materials are produced in India. (TextileExchange 2021a) The transition towards more organic fibres requires collaboration among International Farmers Association, Non-Governmental organizations (NGO), Governments, Trademarks, Consumers Associations and designers. The amount of organic cotton is now about 0,5-0,7% compared to conventional cotton and the price is 10% higher. New solutions must be created to tackle the issues for growing the organic fibre market. (Uygur 2017)

Better Cotton Initiative (BCI) is a program for producing “better cotton” that focus mostly on minimizing water and chemical use in cotton production. BCI’s mission is also to improve the production practices of as many farmers as possible by supporting the farmers with their management system and principles. The management system helps farmers to continually learn and improve their farming. BCI also considers the social view of cotton production by providing the workers better working conditions and fair compensation. There are several principles such as optimizing the use of water and water availability, conservation of natural habitats, soil management practices and labour rights. (BCI 2021) Thus, BCI cotton is considered more sustainable, but they do not label themselves as ‘organic’.

There are some natural materials that can be classified in the eco-textile category. Hemp and linen are natural fibres that can be said to be ecological because they are renewable and do not need as much energy, chemicals, and water in the production as cotton does (Räisänen et al. 2017, 41). Hemp is mostly produced in the USA when linen in Europe. Both have currently low fibre production if compared to other natural fibres. (TextileExchange 2021a). Hemp is a great material since it does not need as much water, and it is possible to get 250% more hemp compared to cotton in one cultivation area. Linen on the other hand needs a little more water than hemp, but it has great properties such as biodegradability and anti-allergenic characteristics. (Muthu 2014, 12-13)

2.5 Designing sustainable textiles

Designer's task has become more complex since modern products need to be beautiful, hold up high standards and be suitable for consumers. On top of all that the products need to be sustainable, and designers need to understand all the factors that sustainable textile products have. (Fathy 2016) Designing for sustainability means that the design must influence consumer habits, lifestyles, and practices such as use, reuse and recycling (Wahl & Baxter 2008). Thus, sustainable design should take into consideration environmental aspects but also cultural, ethical and economic values (Niinimäki 2015). There are different design strategies that can potentially reduce the environmental impact of textiles. Niinimäki and Hassi (2011) has introduced the idea that when consumers have more active part in the design or manufacturing process, it is possible to increase the uniqueness of the product and therefore deepen the attachment to the product itself. This can be done through design strategies such as co-creation, customization or providing design services for customers. The European Commission (2015) has made an action plan for Circular Economy that is used in many literatures to describe the core of the sustainable textile strategy. The areas that include in the action plan are such as production, processes, raw materials and waste.

According to Niinimäki's and Karell's study (2020) one company had provided the designers a list of materials that were accepted from the sustainability point of view. This way it was clear to the designer what materials can be used. The designers have found to

have gaps in knowledge about current limitations of recycling and sustainable design strategies. Thus, companies need to give clear instructions for designers upon material selection. Meanwhile manufacturers need to be able to verify the source of the sustainable material while meeting the company's standards and at the same time meet the designer's aesthetics expectations. (Fung et al. 2021) Furthermore, Niinimäki and Karell (2019) argues that the problems in sorting and recycling could be resolved if the design would take them into consideration at the design phase. According to their study, the dialogue between design, sorting and recycling is now absent in designers' actions. Designers are interested in using recycled materials but does not yet design for recycling. The main challenges are the lack of available materials and the lack of knowledge about sustainable practices. Furthermore, the designers cannot control how consumers dispose their products, but they can affect the recyclability of that product. Designers need to design so that they balance between aesthetics, functionality and recyclability.

Quality of the textile is also an important design factor of sustainable textile. According to Aakko and Niinimäki (2021), quality can be divided into objective quality that contains physical features of the textile and perceived quality which is subjective judgement that comes from the consumer. Perceived quality is harder to measure because it is subjective thus vary greatly. Therefore, understanding the concept of quality from the user's perspective is essential for gaining knowledge and creating sustainability by design. Quality plays a high role in extending the textiles life cycle with the potential of selling the product forward in second-hand markets, potential modifications, and upcycling.

Designers will face constrains when designing for new sustainable products. They need to take life cycle approach (Figure 4) into the design and identify which stages of the life cycle creates the most negative environmental impacts and try to reduce them. (Fathy 2016) This is also called as eco-design (Niinimäki 2006). The decision to adopt sustainable materials such as recycled materials create a challenge for textile companies that does not yet see it as a priority because the materials are limited in sizes, types, colours and shapes. (Todeschini et al. 2017) Furthermore, the design must be cost-efficient and easy to manufacture. The new requirements will determine the choice of fabrics, colours, patterns, manufacturing methods

and finishes that are possible the use. The designer must think of the possible impact of their design will create from the raw material production to the disposal of the product. The designer should also be aware of the environmental impacts of different fibres, with concerning the method of production, durability and recyclability. It is ideal to incorporate sustainability into the heart of the design and brand identity. Designing for sustainability encourages better environmental awareness among consumers and help differentiate from competitors with valuable imago. (Fathy 2016)

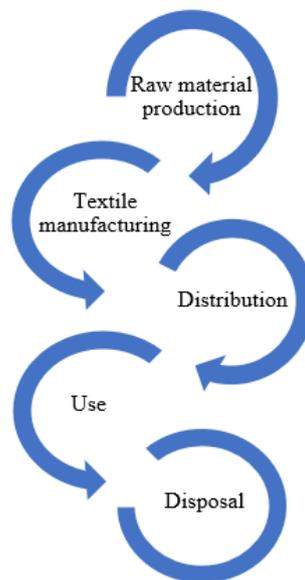


Figure 4. Textile life cycle stages (Fathy 2016)

The designer should evaluate the manufacturing process of the textile so that there is not too much use of energy and water and no use of toxic chemicals. The designer can also affect the environmental problems that happen in the use of the product by making suitable material decisions. (Niinimäki 2006) To note, the use of textile is not studied as much as other life cycle stages which has left the use phase of textile and its environmental aspects in the dark. It is though hard to evaluate since it happens at the consumer's end. (Diekel et al. 2021) Going towards sustainable textile design can be hard for small- and medium-sized companies since they must make their choices from limited possibilities. Finding suitable

sustainable material that can be ordered in small amounts is a challenging task (Niinimäki & Aakko 2014). In addition, according to Niinimäki (2006) natural materials are not always better than synthetic materials when consider their environmental impact. The design would be more sustainable if it uses minimum amount of material and recycled material by choice. The most important aspect according to them is that the product is also recyclable.

2.6 Transportation & packaging

Textile products are produced and transported all around the world. Most of the textile producers are located in four large production areas which are China, India, Latin and South America and Pan European and Mediterranean regions. The supply chain might contain only one link or several links locally or globally, depending on the company's supply chain. The goods are transported through the supply chain links and the number of these links and logistics activities are very important since they establish the total emissions that is produced in transport. (Eryuruk 2012) According to study made by Bevilacqua et al. (2010) transportation was the main CO₂ emission creator in a production of a wool sweater. The carbon footprint from the whole LCA was 34% depending on the choice of transport. By changing the transport module, it would be possible to cut down the CO₂ production by 20-30% for example changing the transportation from road to rail or from plane to boat. The combination of different transport methods also found to decrease the emissions. To add, in theory if all the textile supply chain actors, such as the dyeing mill, the spinning and knitting factory, would be located to the nearest area it would be possible to cut down textile products CO₂ emission by 28%.

Packaging of the product is a very important aspect in terms of sustainability. The material that is used for packaging must also be environmentally friendly. This can be achieved for example, through the reuse of shipping products, the elimination of unnecessary paper and packaging products, the effective use of materials and space and the use of recyclable or recycled material. (Eryuruk 2012) According to Bevilacqua et al. (2010) the contribution of the packaging gives almost 40% to the CO₂ emissions especially if looking at the final phases of the textile products life cycle, which was in the study a wool sweater. Changing

packaging has been often refused by sales managers since they change the aesthetics of the package but also because the new packages might not optimize the truck capacity.

2.7 Characteristics of interior textile

Interior textiles are characteristically different than fashion textiles even though they can be made from the same materials. Interior textiles need to be more durable than fashion textiles and they must withstand such as harder cleaning chemicals, meet industry standards such as flame-retardant and antimicrobial and market demands and need to be stain resistance. Interior textiles are also produced slightly differently than fashion textiles. For example, the products assembly methods such as glue, sew, staple or tacked may influence if and how the product can be recycled or reused. (Calamari & Hyllegard 2016). Thus, products made for interior textiles go through various of stages to meet the standards. Products made for interior textile industry can be roughly divided into four large categories which are upholstered furniture, window and wall covering, soft floor coverings and cushions and household and institutional textiles. Inside the categories are differences in fibre, fabric structure, yarn features colour, finishes and design that creates the finished interior textile for the specific use. (Yeager & Teter-Justice 2000) Interior textiles are also not generally subject to rapidly changing trends and do not have to follow seasonal trends to be successful. Interior textiles last longer and they have higher quality standards which leads to high level of product value. (Büsgen 2012)

Customers are conscious about sustainability also in interior textile products as well as other textiles. Especially in interior textiles the concern has been around the chemicals used in products that could have a negative impact on indoor air quality (Yeager & Teter-Justice 2000). Dangelico, Pontrandolfo, and Pujari (2013) have stated that defining environmentally sustainable textile in home and furnishing product is complex because assessing the environmental impact during design, development and distribution stages is hard to measure and manage. Thus, they have suggested that to be able to design such products specifically in interior industry, firstly aspects as the material, design-specific, energy efficient, nontoxic, and recycled/recyclable factors should be considered. (Muthu 2014, 1)

3. SUSTAINABLE PROCUREMENT & PRACTICES

In this part of the study the concepts of procurement and procurement practices are discussed. The most common procurement practices that companies can use to improve their sustainability are introduced and moreover how they are utilized. The practices are talked about from the environmental and social sustainability point of view.

3.1 Sustainable procurement & purchasing process

Globalization and complex supply chains have elevated the role of procurement. Procurement can be nowadays described as a strategic approach to purchasing. Many companies are being pushed towards new business models and approaches in procurement, such as sustainable procurement practices. Though, many companies are struggling with changing the view from traditional procurement towards larger value creation. (Chick & Handfield 2014, 3) Procurement is a function for acquiring resources and goods and it holds a key role in company's competitiveness and businesses when considering their possibility to create the competitiveness and maintain their business in the future as well (Nieminen 2016, 10;13). Sustainable procurement differs from traditional procurement since it focuses more on the materials used in the product and the products whole life cycle (Genovese et al. 2013).

Sustainable procurement has gained a lot of attention in the recent years since sustainability issues have become more known and companies are interested in what kind of impact they and their suppliers have on sustainability. Sustainable procurement can be said to be the pursuit of sustainable development objectives through the purchasing and supply process. It includes the balance of all three aspects of the triple bottom line. (Walker & Phillips 2009) Sustainable procurement is a process of buying products in a way that there is least impact on society and environment throughout the whole life cycle of the product (Meehan & Bryde 2011). Sustainable procurement is also used for ensuring supplier's sustainability in supply chain (Niinimäki 2016, 150). Textile industry have characteristics that create many challenges for company's sustainable procurement. The supply of raw materials may come

from different geographical locations with different sustainability standards and implications. (Fung et al. 2021)

Procurement holds a key role in company's sustainability as policies and practices need to be extended beyond organization to its whole supply chain. Sustainable procurement needs to make decisions that encompass all aspects of the Triple Bottom Line. (Meehan & Bryde 2011) Scholars have defined sustainable procurement in multiple ways which means that there is no universal definition about sustainable procurement and its practices. This study is defining sustainable procurement according to Berry (2011, 3) that divided sustainable procurement into four main goals that are listed in Table 3. Sustainable procurement starts with the product itself and tries to minimise the environmental and social impacts of selected product or service, which means that the purchaser needs to look at a wider concept than just traditional purchasing criteria's such as price and availability (Genovese et al. 2013; Berry 2011, 26).

Table 3. Sustainable procurement goals (Berry 2011, 3)

Sustainable procurement goals
To minimize any negative impact of goods or services across their life cycle and through the supply chain.
To minimize demand for resources eg. by purchasing resource efficient products or product made from recycled materials.
To ensure fair contract prices and terms are applied and respect that also meet minimum ethical, human rights and employment standards.
To promote diversity and equality throughout supply chain and should support training and skills development.

Purchasing process on the other hand can be described as a simple action chain that is illustrated in Figure 5. There are many ways to form purchasing processes but in general they are similar as seen in the figure. All the parts of the process are linked to each other, which means that if one fails, it influences other parts of the process and the whole success of the purchase. In practice, the purchasing process is not a standard process because it is

affected by aspect such as the characteristics of the product, the strategic meaning and value of the product, supplier market, risk, and impact of the purchase on company's operations. Though, this action chain can be used to present any kind of procurement process in a simple form. (Nieminen 2016, 53) Especially the supplier selection and evaluation parts of the process have been noted in research as important in terms of sustainability (Luthra et al. 2017; Winter & Lasch 2016).



Figure 5. Purchasing process (Nieminen 2016, 53)

Koep et al. (2020) has identified challenges in sustainable textile procurement that are illustrated in Table 4. As can be seen from the table, many of the textile industry's challenges are external, complex, and large which is why they are hard to manage. According to Perry and Towers (2013) the complex structure of textile supply chains is the most crucial external challenge toward sustainable purchasing decisions. They also identified that closer collaboration with suppliers during product development or by integrating design, the supplier could reduce uncertainty and these actions also increased supplier's compliance to sustainable purchasing practices. Study made by Oelze (2017) had similar results that also found that through collaboration it is possible to save resources and benefit from knowledge sharing about sustainability issues and lower barriers. They also identified cost as a significant challenge in creating sustainable supply chain. Being sustainable involves personnel and financial cost, especially the entry cost of becoming sustainable through new certifications and audits are seen costly.

Table 4. Challenges in sustainable textile procurement (modified: Koep et al. 2020)

External	Internal	Individual
Complex structure of textile supply chain	Lack of organization structure	Insufficient communication and cultural difference
Highly competitive industry structure with price and lead time pressure	Lack of resources and implementation costs	
Labour intensive, complex and unsustainable nature of textile products		
Complex and ambiguous legislative environments		
Low demand for sustainable products		

Textile supply chains are usually complex because of textile companies have many manufacturers in different parts of the world and suppliers focus on different components of the textile creation, making the supply chain scattered and managing the sustainable supply chain difficult. To roughly categorize the supply chain, the manufacturers cut, sew and assemble textile products, the factories down the chain dye, weave and finish textiles and at the bottom of the chain are the farms that grow the fibres. (Fashion Revolution CIC 2016) Majority of textile suppliers come from undeveloped countries that do not have legislation to support environmental and labour aspects. (Niinimäki 2015) Thus, suppliers might not have the resources or technical knowledge to comply with regulations even though they have the willingness to act on sustainability issues. According to Fritz, Schöggel and Baumgartner (2017) some companies in developing countries see regulations from developed countries as an opportunity, when others see it too costly because of data collection efforts and the risk of reputation damage when compared to companies with great sustainability performance. Therefore, also the readiness of sustainable performance should not be the only object that is looked at but also the willingness to do better in sustainability aspects.

3.2 Sustainable procurement practices

There are numerous ways and terms used in literature to describe sustainable procurement practices and many tools that are identified for companies to use. Most common and easiest tool for companies to apply in managing their sustainable procurement is the code of conduct (Turker & Altuntas 2014), followed by supplier-self assessment, audits and certificates, audits being the heaviest to use (Fraser, Schwarzkopf & Müller 2020). There are two important practice categories defined by Seuring and Muller (2008) and Beske and Seuring (2014). The first category includes topics as supplier evaluation and assessment, such as

minimum supplier requirements. The second topic examines topics as supplier development and increased communication, which can further be grouped into supplier collaboration.

Furthermore, Tachizawa et al. (2015) have categorized procurement practices similarly into two categories which are monitoring and collaboration. Monitoring is seeing if supplier's environmental compliances are met, with the use of eco-labels, standards, audits and formal assessment of suppliers. Collaboration includes aspects as joint effort to reduce waste, joint establishment of environmentally friendly processes and joint development of environmentally friendly products. Thus, according to the introduced literature this study is introducing sustainable procurement practices as supplier assessment (monitoring), supplier selection, and supplier development and collaboration.

3.2.1 Code of Conduct

Code of conduct is used for ensuring supplier compliance with laws, regulations and ethical standards that are set by the buying company. Code of conduct sets minimum requirements for suppliers, and it can have many specific categories such as labour, environment, ethical, management and health and safety. (Lee & Kashmanian 2013) Codes refer to the expected way of behaving when standards refer to the level a supplier has attained. Generally, codes include mostly social standard that relate to labour practices and working conditions. However, codes of conduct can also include environmental standards. (Berry 2011, 146) There are many company codes existing that specify labour rights, human rights, and environmental requirements for suppliers. For example, labour rights include labour standards which specify norms and rules that can be used on evaluating labour practices at workplace. (O'Rourke 2003)

Most of these labour-right concentrating codes of conducts can be found on labour intensive industries such as the textile industry. Thus, content and format of these codes differs, but many of them are based on the International Labour Organization which includes codes on such as child labour, forced labour, health and safety, wages and hours and women's rights.

(O'Rourke 2003) Hoejmosse & Adrien-Kirby (2012) have argued that many companies use code of conduct mostly because they do not systematically monitor their suppliers and generally if they monitor, they are not focusing on environmental and social aspects, but mostly on economic parts, such as production time and quality and reliability. Furthermore, which is why many companies fail to use the codes properly.

According to study with multiple textile companies made by Turker & Altuntas (2014), many textile companies developed their own codes of conduct referencing to international standards such as International Labour Organization (ILO) Convention, United Nation (UN) Global Impact, Universal Declaration of Human Rights, sector specific standards (e.g. Oeko-tex, Fair Trade Foundation), and other initiatives such as Ethical Trading Initiative (ETI), Business Social Compliance Initiative (BSCI). This is done to increase the adoption of company's code of conduct with its suppliers. The commitment of suppliers to code of conduct can be seen as a significant task in SSMC to reduce risks and to improve supplier performance. In addition, code of conduct can also set social and environmental criteria for suppliers.

According to Turker & Altuntas (2014) developing, updating, and monitoring a code of conduct has become a critical activity in sustainable supply management for companies. Significantly this is done to avoid risks, thus companies use standardization to improve the overall supply chain performance and set sustainability criteria for their suppliers. On the other hand, study made by Egels-Sanden and Lindholm (2015) argues that codes of conduct's have somewhat limited positive impact on suppliers although having improvement in outcome standards. Thus, the improvement is slight and focus on non-compliant suppliers. Furthermore, the results of the study did not find any improvement in specific code areas and did not find answer to the reason why companies use a lot of resources for code of conduct audits. The study states that there might be illusion of more radical improvement on supplier's performance of codes and companies continue to give resources to them because of external pressure.

3.2.2 Supplier assessment: certifications & eco-labels

Supplier assessment is important procurement practice for evaluating sustainability aspects of current and new suppliers. Certification is a tool for companies to use for validating and communicating the sustainability claims of their products and to verify the sustainability of the supply chain. Third-party certificates are the strongest form of ensuring the sustainability claims. (TextileExchange 2021a) According to Mueller et al. (2009) “certification standards demonstrate a system of pre-setting’s with their compliance certified by a third party”. In addition, in textile the use of eco-labels is very common on top of certifications for assessing suppliers (Diekel et al. 2021). To note, there are certificates and eco-labels that focus on different aspects such as the environmental or social point of view or both. This study is introducing some of the most common textile certificates and eco-labels, leaving out more uncommon ones.

There are multiple eco-labels for textiles that make sustainability assessment of supplier’s textile products easier. Eco-labels are voluntary environmental product information schemes (EPIS), which are used as a systematic approach to provide information about a product. The voluntary approach of EPIS such as eco-labels leaves the decision to the company to decide if they are going to label their product. Nevertheless, there are multiple different approaches and focuses on eco-labels and it makes difficult to identify the relevance and quality of the information they offer. (Diekel et al. 2021) Table 5. Summarizes the most commonly used textile eco-labels. Almost all of the eco-labels have some or all aspects of textile life cycle. Especially Cradle to Cradle is focusing on the recycling of the textile material. The research made by Diekel et al. (2021) stated that GOTS performed as one of the best when life cycle aspects were looked at.

Table 5. Commonly used textile eco-labels

Eco-labels	
Global Organic Textile Standard (GOTS)	World leading organic textile production standard that aims to define requirements that ensure organic status of textiles, from harvesting of raw materials, through environmentally and socially responsible to labeling the product. Organic textiles contain minimum content of organic fibres that are processed with minimum environmental impact with respect of labour conditions. (Global Standard gGmbH 2021)
Better Cotton Initiative (BCI)	Is the largest sustainable cotton programme that takes in considering the environmental and social aspect of cotton production. Their mission is to help cotton producers while protecting and restoring the environment. (better cotton 2021)
Global Recycled Standard (GRS)	The goal of GRS is to increase the use of recycled materials in products while reducing the harms caused by their production. It focuses on recycled content, the chain of custody, social and environmental aspects and chemical restrictions. The GRS can be used for any product that has at least 20% recycled material. (Textile Exchange 2017)
Cradle to Cradle Certified™	The approach integrates multiple aspects, such as safe materials, continuous reuse of materials, clean water, reusable energy and diversity. The goal is to achieve cycling of materials that either biodegrade naturally or can be fully recycled. The label has 5 sub-levels. (Cradle to Cradle Products Innovation Institute 2016)
Oeko-Text®	Is very known label for textile safety. Oeko-Text certified products have been tested for harmful substances for humans and the environment. Oeko-Text many different standards but all of them include harmful chemicals. (Oeko-Text® 2021)

The most used certification system is the standardization scheme handled by the International Organization for Standardization (ISO). ISO is an independent, non-governmental, international organization that shares knowledge and develops standards for global challenges. However, ISO does not handle any certifications of their standard, which means third-party assessment must be done to receive a certification. (ISO 2021) Textile supply chains are complex with multi-tier structure and a great number of suppliers and have a lack of direct contractual agreements and power asymmetries. Furthermore, regional, and cultural distances make it difficult for focal firms to have control, maintain, or achieve the desired level of sustainability in their global multi-tier supply chain. (Grimm, Hofstetter & Sarkis 2016) Thus, the use of certifications and labelling is a specific approach towards SSCM in the textile industry. According to Hojmosé & Adrien-Kirby (2012) certificates

are often used as an alternative to code of conduct since they are more specific, which makes it easier to assess sustainability performance across supply chain.

Table 6. Common environmental and social standards

Environmental standards	ISO 14001	ISO 14001 specify requirements for an environmental management system that company can use to improve its environmental performance. The standard is used for managing company's environmental responsibility in a systematic manner and can be used in whole or partly. The standard contributes to the environmental part of sustainability. The wanted outcomes for using ISO 14001 are: enhance of environmental performance, fulfilment of compliance obligations, achievement of environmental objectives. To add, the standard looks from the life cycle point of view. (ISO 2015a)
	ISO 14040	ISO 14040 describes the principles and framework for life cycle assessment (LCA) which include: "definition of the goal and scope of LCA, the life cycle inventory analysis phase (LCI), the life cycle impact assessment phase (LCIA), the life cycle interpretation phase, reporting and critical review of the LCA, limitations, the relationship between the LCA phases, and conditions for the use of value choices and optional elements." (ISO 2006)
	ISO 9001	ISO 9001 sets out criteria for quality management system. The standard is based on multiple quality management principles eg. strong customer focus, top management motivation and continuous improvement. The standard helps customers to receive consistent, quality products and services. ISO 9001 standard can be certified. (ISO 2015b)
Social standards	SA 8000	Is the first and leading social certification programmes. The SA 8000 provides framework for businesses to do business in a way that is fair and decent for workers. The standard includes elements such as health and safety, discrimination, child and forced labor. (Social Accountability 2021)
	ISO 26000	ISO 26000 is a social responsibility standard that provides guidance and clarifies what social responsibility is. It will not give requirements which is why the standard can not be certified. The standard translates principles into effective actions and shares best practices for social responsibility globally. (ISO 2010)

According to Handfield et al. (2002) the movement towards greater environmental responsibility has been mainly the result of ISO 14001 certification standard that focuses on the performance of company's Environmental Management System (EMS) and the environmental impact of the company's processes. Purchasing is one of the key processes accessed in ISO 14001 because it does not only focus on the procurement of materials but also to their life cycle and waste management. The ISO 14001 has been criticized because certified companies vary on how they are performing, and they might have a "front" of sustainable performance and no real change in structure (Mueller et al. 2009). Furthermore, according to study made by Calamari and Hyllegard (2016) NGOs and companies who

provide certifications and labels are seen important stakeholders in minimizing textile products social and environmental impact. Table 6. above introduces the most common environmental and social standards.

In addition to eco-labels and certificates, there are also multistakeholder initiatives that help companies to tackle sustainability issues together. The most known for them is the BSCI. BSCI or Business Social Compliance Initiative (amfori) that provides criteria for supplier audits and help companies to trade more sustainable by joining forces and sharing resources. Many large companies have joined BSCI to get structure and help in sustainability issues. BSCI has created an extensive code of conduct that support their members in social and environmental issues of their supply chain. The criteria's defined by the initiative are for example, special protection to young employees and ethical business behavior. (BSCI 2019)

3.2.3 Supplier development & collaboration

As companies have outsourced most of their activities, supplier development and collaboration has become more important in the globalized supply chains. After the suppliers have been evaluated and selected, the buying company must pay special attention to the suppliers. If the selected supplier turns out not to be able to meet the required supplier performance or capabilities the buying company can use different approaches such as, invest resources to increase the performance or capabilities of the supplier, manufacture the product or service itself, search and replace the supplier or use combinations of the earlier mentioned approaches. (Krause, Scannell & Calantone 2000) Though there are many approaches companies can use to increase suppliers' performance, supplier development is mostly used, since the other activities can be much more costly for the company (Wagner 2006).

Supplier development can be defined as “any activity undertaken by buying firm to improve either supplier performance, supplier capabilities or both, and to meet the buying firm's short- and/or long-term supply needs” (Krause et al. 2000). Sustainable supplier development is more than the traditional approach. It is based on activities to meet

sustainability goals through supplier development. Supplier development toward sustainability is an effective tool that buyers can use to shape their supply base and to mitigate possible supply chain sustainability risk and in many cases is the preferred tool to use (Foerstl et al. 2010). Krause & Ellram (1997) state in their study that good two-way communication, cross-functional teams, and top management involvement are the most important factors when developing supplier.

According to Lu et al. (2012) there are many supplier development practices that companies need to use if they want to improve their suppliers' capabilities in sustainability adoptions. They identified that the buying firm must be willing to share its knowledge on sustainability matters to suppliers. The buying firms should also put an audit and feedback system in place for monitoring suppliers' sustainability implementation actions and the outcome of implementation. Lastly, the buying firm has to be ready to be directly involved in supplier's sustainability implementation or to give problem-solving efforts for to help the supplier. Thus, communication with the supplier must be good for supplier development actions to succeed.

Supplier collaboration on the other hand, is form of business process where supply chain partners work together to plan and execute supply chain operations to reach shared goals. Moreover, sustainable supplier collaboration is working jointly with suppliers to achieve sustainability goals. Collaborative activities include joint planning sessions in regard of environmental issues, such as knowledge sharing activities to design greener products or process modification activities. (Vachon & Klassen 2006) Study made by Gimenez et al. (2012) shows that supply chain assessment has no impact on the triple bottom line unlike supplier collaboration which impacts all three aspects. Tachizawa et al. (2015) have had similar results and states that both suppliers and buyers need collaboration for them to achieve environmental sustainability. Which is why it can be said that collaboration is very important procurement practice to use.

According to study made by Oelze (2017) collaboration has a beneficial effect in order to implement sustainability policies along the supply chain. To enable collaboration within the

supply chain, sustainable thinking must be rooted in the company's culture. In addition, internal commitment in regard of sustainability issues has strong effect on implementing solutions. Collaboration with other textile companies has proven to be beneficial in addressing sustainability issues. There is also shown to be an obvious need for wider collaboration for creation of new sustainable textile material innovations. (Kääriäinen & Niinimäki 2019) Supplier's may provide valuable information through collaboration about new environmental technologies, new environmentally friendly materials, and solutions to reduce environmental impact. (Dangelico et al. 2013)

3.2.4 Supplier selection & evaluation

Companies need to use considerable amount of time and effort to select the right suppliers. Using a single model or one criteria lead to biased decisions which is why multiple perspectives must be used in the decision making. Thus, companies need to select multiple criterions. Supplier surveys and questionnaires are often used for helping in supplier selection and evaluation. (Ordoobadi & Wang 2011) Supplier selection has also a critical role in helping company to achieve maximum ecological-economic benefits and there are many methodologies and criteria described in research that companies can utilize. The sustainable supplier selection criteria presented in literature are such as green management, environmental packaging and labelling, waste management and pollution, environmental manufacturing and employee rights. (Luthra et al. 2017) One of the main challenges companies face in supplier selection is choosing the right criteria. Developing a list of sustainability attributes and measuring them help companies to have better understanding of the concept of sustainability. (Fallahpour et al. 2017).

Supplier evaluation is done in multiple parts of the supplier selection process. The first step is supplier pre-qualification, in which appropriate suppliers have been identified and others have been eliminated. For the first step information about the suppliers have been collected for example by survey, which after the suppliers are analysed. After gathering information, the supplier material is considered and furthermore audits might be conducted to make sure that the requirements are been filled. Though, supplier selection refers also to the evaluation

and selection of new suppliers when supplier controlling focuses on assessment of existing suppliers' performance. Evaluation of existing suppliers' performance is also critical since it helps to recognize changes over time as well as react to them appropriately. (Winter & Lasch 2016)

According to study about sustainability criteria ranking made by Luthra et al. (2017), environmental criteria are seen most important sustainable supplier selection aspects in today's environment when social dimension in supplier selection do not get as much attention. Traditionally supplier selection criteria have been focused on cost and quality (Genovese et al. 2013). Fallahpour et al. (2017) state that there are two important aspects of sustainable supplier selection. When starting the supplier selection process, the main and sub-criteria that will be used for supplier evaluation should be created. Secondly, the method that is applied in supplier selection should be decided. According to their research environmental aspects were seen only little more important than social by companies. Figure 6. Is presenting the most important environmental and social supplier selection criteria that rise from the research.



Figure 6. Environmental and Social aspects in supplier selection (modified: Fallahpour et al. 2017)

Winter and Lasch (2016) have studied how environmental and social criteria can be applied to supplier evaluation in the textile industry by evaluating multiple textile companies' purchasing practices and criteria. The study showed that social criteria were a high number of importance and relatively large number of them were applied, however environmental criteria were not as often used. There may be difficulties in obtaining data on environmental performance and transparency might be the issue among supplier's environmental aspects. The companies see environmental and social criteria important and mostly apply them in supplier selection as a pre-qualification of as supplier and in supplier monitoring and verification of compliance with purchasing requirements. Still, it was not identified that the sustainability criteria were part of the final selection of suppliers when traditional criteria such as price and quality were.

4. DESIGN OF THE STUDY

This part of the study discusses the chosen methodology, data collection, data analysis process, reliability and validity of the study, and furthermore introduces to the case company. The study is conducted as a qualitative case study due to the characteristics of the problem that are studied. Furthermore, the primary data is collected through semi-structured interviews and the secondary data through multiple data sources.

4.1 Methodology

The research method chosen for the study is qualitative research because the characteristics of the problem are very complicated, thus which this study tries to understand more in-depth. This is typical for qualitative research since the data is more likely to be varied and complex (Saunders et al. 2016, 568). Furthermore, qualitative research is often used for investigation of phenomena and getting deep understanding about them (Metsämuuronen 2006, 81). Thus, qualitative research is great for studying complex issues that are happening in real world, such as sustainability and textile supply chain. Qualitative research itself refers to multiple different comprehensive research methods and it is hard to define distinctly (Metsämuuronen 2006, 83).

Moreover, this study will be conducted as a qualitative case study since it is focusing on one particular textile company that needs to make actions towards buying sustainable textiles using procurement practices as a support. According to Seuring (2008) case study is particularly useful when studying supply chains because it allows direct observation of the field and phenomenon. Yin (2003) has defined case study as “an empirical enquiry that examines a contemporary phenomenon within its real-life context”, which in this case is the company and its suppliers. In a case study the boundaries between the phenomenon and the context are not evident which is why multiple sources of evidence is used. Case study allows to study a contemporary phenomenon that is difficult to separate from its context. (Halinen & Törnroos 2005)

4.2 Data collection

The primary data for this study is collected through two interview questions that are found in Appendix 1 and 2. In total eight semi-structured interviews took place to gather the data. The interviews were made through video calls and emails since the suppliers were located all over the world. Interview with the case company representative was also through a video call. Most of the interviewed suppliers were textile manufacturers who manufacture the textile in their facilities. Two of the suppliers were textile distributors, in other words editors, that buy textile and sell it forward. Suppliers that participated in this study were chosen with the case company. Semi-structured interviews were chosen because they are characteristically flexible and leave room for participants to offer new ideas to the study. Semi-structure interviews create conversation that is not too structured but have questions that comes from the theory and thus create possible in-depth exploration of the phenomenon that is studied. (Tuomi & Sarajärvi 2018, 85; Galletta & Cross 2013, 2, 45) Semi-structured interviews also leave room for following up individual points even though same questions are asked from each interviewee (Lee & Lings 2008, 2018). In addition, as more evidence, secondary data is used for this research. The secondary data used is also qualitative. According to Yin (2003) multiple sources of data is often used in case studies since it improves the reliability and validity of the study.

The interview questions were formed from the themes that were introduced in the theory part. The case company helped with forming the questions. The interview questions that are found from the Appendix 1 were sent to the suppliers well before the interviews were conducted through Microsoft Teams. All interviews with suppliers were recorded, and the answers were written into text afterwards, in other words transcribed. When transcribing the data, the researcher must be subtle and notice not only the words but the way they are said and the tone of the voice. Without considering the non-verbal communication of the interviewee, important observations may be missed. (Saunders et al. 2016, 572) In addition, some follow-up questions were sent via email to get additional information to topics that rose after the interviews.

Table 7. Secondary data used in the study

Secondary data	Type of data
Case company's website	Website
Supplier's website	Website
Supplier's website	Website
Supplier's website	Website
Supplier's website	Website
Supplier's sustainability actions	PDF document
Supplier's sustainable products	PDF document
Supplier's sustainable products	PDF document

The secondary data was acquired from many sources that are listed in the Table 7. Secondary data is used in various research, and it has great advantages because it is readily made and thus easy to attain and analyse when the researcher does not have to collect the data itself (Saunders et al. 2016, 358). Hence, as much information as possible was tried to gather about the complex topic through multiple data sources. The secondary data was mostly from the suppliers' website's sustainability pages. To note, some of the suppliers did not have a website page with sustainability information that could have been used as a data source.

4.3 Data analysis

The data that was collected through the interviews was chosen to be analysed using content analysis method. Content analysis is a typical method that is said to be fitting for every type of qualitative analysis. Moreover, content analysis is especially used for analysing text. Text can be loosely described as any form of document that is written. (Tuomi & Sarajärvi 2018, 103,117). Thus, to be able to conduct a content analysis the data needs to be formed into text. Content analysis helps to analyse large amount of textual information by systematically identifying its properties such as key words and word frequencies. The data that is collected for the analysis can be from interviews, open-ended questionnaires, documents, books, articles, and also from non-written materials such as photography and video. (Klenke 2016, 94)

As mentioned above, the data was transcribed into text, after which it was furthermore categorized with the help of the themes that were found from the data. Categorizing the data through themes is a form of content analysis method. It focuses on what on each theme has been said and furthermore splits and groups data with different topics. This makes it possible to compare the different themes that are found from the data. (Tuomi & Sarajärvi 2018, 105) To help the categorization, the data that was chosen to be used in the study was moved into separate file.

4.4 Reliability and validity

There are many factors that need to be considered in terms of the reliability and validity of this study. The reliability of the research refers to how the raw data is transformed into a form that can be analysed. When the data is transformed it is important to use consistent methods. (Lee & Lings 2008, 237) In other words, reliability describes how well the results remain the same if the study would be conducted multiple times using the same research method. Furthermore, validity refers to how well the conclusions reflect the data that is collected and how well the conclusions can be justified (Lee & Lings 2008, 238). In conclusions, validity tells how well the chosen research method can find the answers it was planned to find. Multiple interviewees were conducted to increase the reliability of the study. To note, one interviewee sent the answers to the questions by text. All of the interviews that were in Microsoft Teams took about an hour. The interviewees were professionals in multiple areas and all of them are listed in the Table 8.

Table 8. Interview suppliers

	Supplier	Country	Position
Manufacturer	Supplier A	Italy	Marketing Manager
Manufacturer	Supplier B	Canada	Sales Manager
Manufacturer	Supplier C	Belgium	General Manager, Brand Manager
Manufacturer	Supplier D	Belgium	Sales Manager
Manufacturer	Supplier E	Italy	Project Sales & Exports Manager
Editor	Supplier F	Belgium	GESH Manager, Content Lead Production & Sustainability
Editor	Supplier G	Israel	Managing Director, Textile Design & Product Development

Most of the interviewees were not working directly with sustainability issues but were aware of them. Thus, smaller suppliers did not have any particular person or a team that was responsible for sustainability issues. The country in which the supplier is located is also mentioned because it can influence how well they perform on environmental and social issues. In addition, both the case company and the case company's suppliers were interviewed to get data from both sides and more in-depth understanding about the topic. The interviews with suppliers were conducted in English, which was not the interviewees' and interviewer's first language, which might have affected the results of the study. The issue was taken into consideration by sending the interview questions by email a week before the interview took place so that the participant could prepare as well as possible.

4.5 Case company introduction

Lauritzon is family-owned company that currently has about 25 employees working for them. The company is operating in the interior textile industry, more specifically with upholstery textile products. Lauritzon was founded in 1911 and it has a long history of designing upholstery textiles. Most of the textiles are sold in Finland but they have distributors in Baltic countries and Sweden. (Lauritzon 2022) Despite the size of the company, it is one of the largest actors in Finland in designing upholstery textiles. Sustainability is becoming a very important value to the company. Thus, Lauritzon has been starting to implement sustainability practices and is currently working on the sustainability issues in the textiles they design. The company is at the start of implementing sustainability practices but as a small company it can be fast in its decisions and easily make changes inside the company. Furthermore, the company culture is very open-minded and innovative.

Lauritzon has made several sustainability actions inside the company. *“We use 100% recycled plastic in our packaging, wind power in energy and recycle as much as possible. If there are leftover textiles, we try to find a further use for them rather than throwing them into trash. The fabrics are for example donated to kindergartens for art material.”* Lauritzon has a drive and a vision to become a sustainable upholstery textile editor company, however there is currently a gap of implementing sustainability practices in buying and supplier

management. Thus, this study aims to help the company to succeed in evaluating suppliers and sustainable fabrics. Lauritzon wants to become truly sustainable, which is why they educate themselves about sustainable textiles.

Lauritzon's current purchasing process differs according to which kind of material is bought. Figure 7 presents their current purchasing process in a simple form. Generally, it starts from the design and fibre/fibres that can create the wanted look and feel. Lauritzon chooses what kind of textile fabric they want and source their supplier's. Many times, the textile is sourced from fairs where suppliers show what kind of fabrics they have to offer. They decide what will be purchased according to what the suppliers have and what is the market need. In many cases, additional changes are made to the product. The changes can be such as modifying the colours and adding different fibres to the fabric to make it stronger or to look slightly different than the original product. When the changes are approved and they meet the company need and want, then the model pieces can go to production. Thus, the buying and designing process is never a straight line and it can be affected by multiple things.

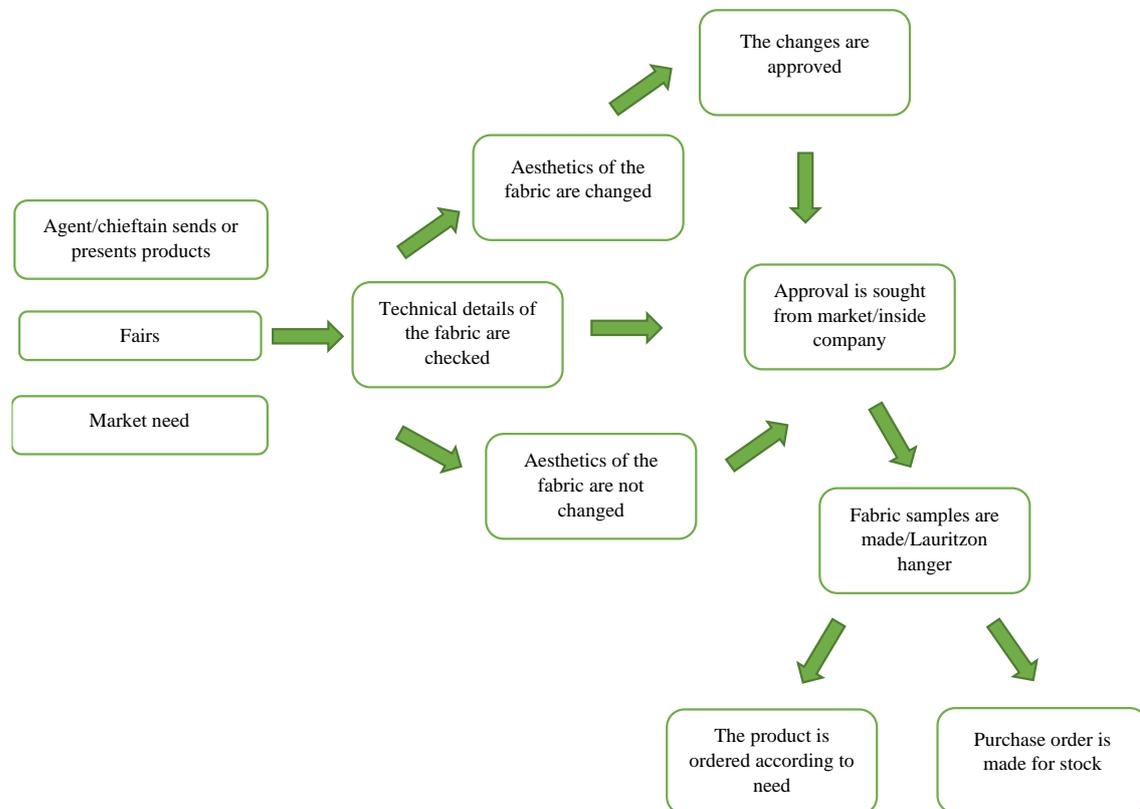


Figure 7. Lauritzon's purchasing process

Suppliers are currently asked to give technical details about their textile products through Lauritzon's technical detail form. The fabric needs to technically fulfil certain areas such as strength and flame retardment for the company to buy the textile. According to the company, they send their form for receiving the details but in many cases the suppliers do not fill it all the way since the form is in their words "*extensive*". Suppliers find it easier to send their own detailed information about the product instead. The case company does not currently use specific practices or monitor to ensure that their suppliers are sustainable. According to them they have looked at technical details of the product and relied on that if the product quality is good then the manufacturer must be also responsible in its actions. They also work with suppliers that are reliable and require either Oeko-tex or Reach certification from them. Additionally, more and more of their suppliers are working towards sustainability.

5. EMPIRICAL RESULTS OF THE STUDY

In this part of the study the empirical results found from the interviews and secondary data will be described and analysed. Firstly, the two themes that were introduced in the theory part will be looked at: sustainable textile and sustainable procurement. The first part is from the suppliers' point of view, that are either manufacturers or editors. Some of the suppliers are smaller in size and some of them are large actors in the upholstery textile industry. The second part will look at sustainable upholstery textiles and designing them from the case company's point of view. The aim is to find out what is the current situation in the company and possible challenges of going towards designing and buying sustainable textiles. The suppliers and the positions of the interviewees are presented in Table 8. To note, the supplier's level of transparency and willingness to talk about sustainability issues varied noticeably.

Before going into the main two themes of the interview with the suppliers, all interviewees were asked to describe what is sustainability for them. Sustainability was seen as a wide topic and the descriptions were not all the same. Some described sustainability as the TBL approach, which includes the environmental, social and economic sustainability. Sustainability was also described by supplier A as *“Building a balance to man and the environment and to create a development that safeguards the environment in a way that does not compromise the future”*. Couple of the suppliers said that there's a lot that can be said about sustainability since it is a wide topic and there are a lot of different names for it. Supplier F defined sustainability as the aspects in the United Nation's Sustainable Development Goals. Supplier B specifically described that sustainability comes from the product itself. Supplier C extended the idea by saying that sustainability for them is reducing the use of virgin materials and pollution of processes as much as possible and also taking the end-of life aspect of the product into consideration.

“For me sustainability comes from the product in our market. One aspect is that it needs to be a product that is made in the most environmentally friendly way, other aspect is that it does not lose other qualities of the product.”

Table 9. Certifications & Eco-labels of the interview suppliers

Supplier	Certifications & Eco-labels
Supplier A	GRS, Oeko-text, BCI, TUV
Supplier B	ISO9001, ISO14001, Oeko-text, Reach, Greenshield
Supplier C	ISO9001, GRS, Oeko-text, SEAQUAL
Supplier D	GOTS, Oeko-text
Supplier E	GRS, ISO14001
Supplier F	ISO9001, ISO14001, Oeko-text, GRS, OCS, Reach
Supplier G	Oeko-text, Reach, GRS

Sustainability was seen important in almost all interviewed suppliers' strategy, and they recognized that they must take care of sustainability issues. Thus, some of them had more drive towards sustainability than others. Supplier C has made targets in multiple sustainability areas which they monitor with the help of an action plan that is made for each year. The supplier is actively working on improving their actions in both environmental and social sustainability. They for instance are currently trying to find out if solar panels can be installed in other places than the roof to maximize solar energy and has made improvements to use less energy compared to previous years. This shows that the supplier does not settle and tries to improve continuously. They also have environmental and social policies that guide all actions. They highlighted that it is very important to have policies but moreover it is essential that they are executed and monitored. The larger suppliers had implemented or were implementing the ISO 14001 and mentioned that it gives guidelines and regulations on how to be sustainable. Table 9. above summarizes the eco-labels and certifications that the interviewed suppliers have.

5.1 Environmental and social aspects in upholstery textiles

There are many alternatives to traditional textiles that are produced more environmentally friendly that can be called sustainable. Interviewees were asked to describe what is a sustainable textile product, what kind of sustainable products they have and how they consider sustainability in the production of these textiles. According to supplier A

sustainable textile product is recycled and recyclable, with low environmental impact. According to supplier B the environmental aspects must not compromise the quality of the product, and especially in the upholstery textile industry the product must be also durable and last a long lifetime. Thus, quality of the product is seen as aspect of sustainability. Other suppliers also mentioned quality as an aspect but did not highlight it as much. Almost all, excluding one supplier, defined that sustainable textile product is a product made from recycled material. This can be highlighted since there are many other textiles that are classified as sustainable. Other kind of sustainable textiles were also in production, including textiles made from biodegradable material. To note, not one of the suppliers mentioned organic textiles when they talked about sustainable textile materials. Virgin materials were seen more polluting, and which is why most of the companies had decided to go towards mostly recycled materials.

“If the product of the textile fabric is made of 100% recycled yarns, it is recyclable afterwards too and is sustainable fabric.”

“We can make an environmentally friendly product that does not last long, that is not sustainable anymore.”

“Sustainable textile material is how we at the end recycle or have the possibility to recycle.”

“There is no such thing as a sustainable fabric. There is only some are little better than others.”

The suppliers have developed multiple different sustainable textile products that they have already or are currently bringing to the market. For most of them these sustainable products were a new thing. Most of the products that the suppliers were offering were from recycled materials. Though supplier B who has been focusing more on manufacturing polyester, had been working toward biobased material. According to them they want to increase the number of biobased materials every year. The percentage of the product's material is 75% biobased, which is according to them “*a lot*”. The products from recycled materials were mostly polyester product that were made from recycled PET bottles. The process of making

polyester from PET is illustrated in Figure 8. As can be seen from the illustration there are many steps when polyester is produced from PET bottles.

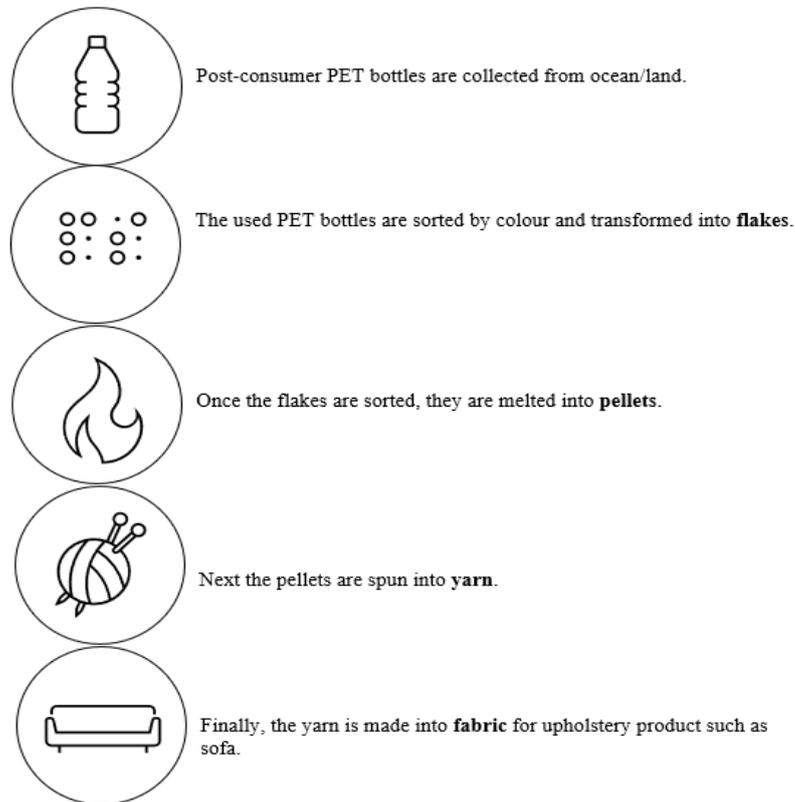


Figure 8. PET bottles to fabric

The recycled PET is mostly sourced from China. Supplier C mentioned that there were not many vendors in Europe that supplied recycled polyester yarn. The PET bottles that are used are found from land and from sea. The bottles that are collected 10% from marine waste and 90% from post-consumer land waste have the SEAQUAL certification. The textiles made from SEAQUAL® YARN must also contain the minimum of 20% of the material (SEAQUAL 2022). The bottles that are collected from land have GRS certification. Though, the certification is seen misleading since to attain the certification the product must have minimum of 20% recycled material. Supplier C stated that, “*You speak about that it is recycled the moment that there is 20% of recycled materials into your product. To be honest for us 20% That was not enough. That is like cheating a little bit yourself*”.

Supplier E stood out from the other suppliers since it has been working over 15 years to produce recycled cotton. Their production process has been developing during these years to produce high quality recycled material. They have been especially focused on natural material since it creates a lot of negative environmental impact. According to them, their production process saves water and chemicals since the recycled product does not need to be dyed. The colours are obtained by blending different coloured materials together. The products are also obtained mostly locally, and according to them the fabric material is traceable as it is also GRS certified. The supplier works in Italy where post-consumer waste collection is high and the system for recycling is good. They are currently producing 90% recycled cotton and 10% non-recycled, and their target is to in the next two years is to produce only recycled products. The virgin cotton that they buy comes also close. In addition, the supplier has minimized many areas in the textile production that creates negative effects on the environment.

Supplier D on the other hand was the only company that produced fabrics only made from natural fibres. The company is focused on producing fabrics made of linen, that is considered a sustainable natural material. The raw material is sourced close by since there are many linen farms in Europe. According to them their whole supply chain is traceable and mostly local. Growing linen does not need as much water as cotton and it is also proven to be a biodegradable fabric, which makes it have great sustainability aspects. The supplier has GOTS certified linen, and all products are Oeko-tex certified. The supplier is not fixed on bringing any recyclable products and according to them: *“Recycling linen like using linen fabrics and making something you have is not a process that we are applying for a moment. It’s something we sometimes think about, ... but in the end, a lot of recycling is about polyester and now about non-natural fibres”*. The supplier said that they try to make the production of linen as sustainable as possible by using only renewable energy and finishing and dyeing the product the most sustainable way. They also invest in new technologies and machinery, and on top of that plant trees in other parts of the world. There is also no fabric waste that comes from their production since they are all collected and recovered by other companies into multiple different by-products such as animal beddings, textiles and chipboards.

The suppliers have noted that textile production creates a lot of harmful chemicals and pollutions. Since the manufacturing suppliers are in Europe and Canada, they have to follow strict regulations concerning wastewater, pollution and recycling. On the other hand, this would not be the case in undeveloped countries where there are not so many strict regulations. In addition, many of the suppliers have attained ISO 14001 and ISO 9001 that take care of inspecting that environmental and social issues are under control. Supplier E mentioned that they specifically wanted to have the ISO 14001 because it is handed by an independent organization when many other eco-labels and certifications are monitored by a company. Company B furthermore noted that different countries have different labels and certifications that are required, thus it can make it hard to know which is for which. They try to attain as much of them as they can since customers require them, but the abundance of labels and certifications can be overwhelming.

The manufacturing suppliers have made many alternations to their production processes to become more sustainable in their production. Since the production of the materials from fibre to making the yarn and in the end the fabric creates a lot of emissions, the suppliers have tried to minimize them. Many of the manufacturing companies have installed solar panels to use solar energy and mechanism to re-use and treat wastewater. Thus, different forms of renewable energy were also used. By making changes in water processes the manufacturers can save generally 70% to 90% of water. Many of the suppliers also have high focus on recycling. Supplier C monitor that all waste is recycled very carefully. They also receive data how much waste they make and try to lower it by making new solutions. Furthermore, they try to minimize energy use by using machines as efficiently as possible. Supplier F also said that they have their own sustainability targets that they monitor. Supplier B on the other hand stressed that the alternations to their processes are made because the national legislation will not allow almost any pollution to the environment. In conclusion, the manufacturing companies had made similar changes to minimize their air and water pollution.

When it comes to the social aspects of textile production, the interviewees were asked to describe how they take care of social issues in their own and their vendor's actions. As

mentioned above, the suppliers are located in developed countries in which the employee rights come from the national legislation and are stricter than in some parts of the world. Thus, the suppliers have their own internal projects to protect employee health and safety. The suppliers mentioned internal programmes that educate their workers in terms of health and safety at work. Supplier C highlighted that in the country they are working in there is not a specific degree for textile industry, so they train everyone in house. They have also made an employee level system which helps people to move forward with their career inside the company. Thus, the people are seen also as a valuable aspect to the supplier, and they want them to learn more and grow inside the company.

The smaller suppliers relied on that their vendors were respectful to their employees, since they have been working with them for a long time and had created partnerships. They also relied on that the certifications they were getting would notice if there were any social issues in the vendor's end. The large suppliers and some of the smaller ones visited their vendors mostly once a year to detect any issues. Supplier B had locally people under their payroll to regularly check the suppliers in India and China. The suppliers did not mention if they have found social issues in their supplier's working conditions. Supplier C also highlighted that they especially visit their Chinese suppliers. Child labour issues were also especially emphasized by the interviewees. Some of the larger suppliers worked with vendor's that are mostly ISO 14001 certified and have started to require it from all of their vendors. Thus, social aspects were not talked about as a big problem inside or outside the company. Environmental aspects of textile industry's sustainability issues were more emphasized.

Supplier G that is an editor company did not see that sustainability issues were dominating the market. They saw that the demand was growing, but not that many were willing to pay for a sustainable product. They also viewed sustainable products quality wise inferior to products made from virgin materials and has observed problems in them. Though, they sell products all over the world and noted that the market in Scandinavia is more focused on sustainable products. Thus, they are constantly developing new sustainable products and will be doing it if the market requires it. To note, the supplier talked about fake leather goods. As a comparison, Supplier B who manufactures fake leather products saw sustainability issues

as very important and wanted to grow their percentage of sustainable products every year. They have also received a lot of demand from the market, which is why they invest in new sustainable solutions and certifications. They were also planning on changing their whole collection to recycled polyester.

The finished fabrics are transported from the manufacturer or from the editor's warehouse to Lauritzon. In Europe the transport mode is mostly by truck and outside of Europe the goods come either by ship or airplane. According to the suppliers the transportation is standard, and they use the modes that are best for them. Though, in terms of sustainability some suppliers mentioned that they try to maximize the use of transportation by using full containers and trucks. Supplier F was the only one mentioned that they monitor and try to lower their emissions in transportation by working with the forwarding companies. They said that most of their footprint comes from the fabric itself but what they can have a better control over is the transportation. If they plan and order better, they will not have to use air freight in their deliveries. In conclusion, transportation emissions are not monitored in the companies as much as the emissions that comes from the production of the fabric. On the contrast, most of the suppliers have started to use packaging that is made from recycled plastic. The suppliers that were not yet using recycled plastic were looking into it. Many of the suppliers also try to reuse their pallets as many times as possible.

5.2 Sustainable textile procurement & practices

In the second theme the suppliers were asked about procurement practices and how they use them. Manufacturing or buying sustainable textile products was relatively new and ongoing process for most of the suppliers. Many of them had started moving towards recycled product a couple years ago because the market was demanding it. According to supplier C when they started a couple years ago to investigate their vendors about recycled yarns, they did not have any and many of them were sceptical about it. According to the supplier the business environment is moving towards better direction but there is still a lot of work to do. They also had the idea that they want to go toward 100 % recycled products, but in the end, it was not ideal decision since it was too expensive. Thus, which is why they decided to make all

products partially recycled, but never go below 50%. Supplier F has also similarly partially recycled products that are mostly 50% recycled or over.

“It was quite disappointing that suppliers themselves did not come with a story like look we have a fantastic new range of yarns in 100% recycled materials... We had the opinion that they were not very busy with it. I’m speaking about 1-2 years ago, now it’s getting better, but we have to constantly ask it, it’s a long process. “

The suppliers’ vendors are located around the world, mostly in Asia and Europe. Couple of suppliers that mentioned that their recycled material vendors come from Asia started the talk about it a bit hesitantly by saying “to be honest everything comes from Asia”. Asia was still seen as a bad place to purchase materials and supplier C mentioned how in Asia recycled PET bottles were made in a factory only for them to go recycling and then called ‘sustainable’. Supplier E stated that, “*The supply chain is checked, and we know that it comes from a local market* “. Many of the suppliers said that the Asian vendors were monitored by visiting them regularly. Suppliers also relied on third parties that would detect problems when they were being certified and there were inspections. They also mentioned that when it comes to knowing more about the materials, vendors in China were most willing to answer to the questions since the material comes from there. European vendors that buy from China had difficulties to tell details about materials that they sell. On the contrary, supplier G mentioned in more positive note that they only work with Asian vendors and that they have very tight relationship with them. According to the supplier their Asian vendors use cutting-edge technologies, and the vendors are very cooperative with them.

The interviewees were asked if they would accept and comply with Lauritzon’s new Code of Conduct. The Code of Conduct (Appendix 3) includes labour and human rights and environmental sustainability. In the environmental sustainability part especially waste management, recycling and packaging and transportation were highlighted, since they are important issues to Lauritzon. All suppliers were willing to comply with the Code of Conduct as a whole and saw that it was in line with their actions and their values. The larger suppliers used Code of Conduct to comply their vendors. The smaller ones did not have a Code of

Conduct and they justified it by saying they have a close relationship with their vendors, and they trust that their vendors work ethically since they also follow the rules. Some of them mentioned though that it is a good idea to have one.

The suppliers were asked how they view collaboration and how important it is to create new sustainable products. Collaboration was viewed very important and many of the interviewees stressed that it was the most important aspect when innovating a new product. According to supplier C collaboration is very intense and close with their vendors, and it is extremely difficult for them to switch a vendor when they have started working with them. When they started to work towards recycled yarns the vendors did not have them. They collaborated with the existing vendors to create recycled material and at the same time pushed them towards sustainability. They also stated that, *“Supplier collaboration is very important because first of all we have to motivate our suppliers to start creating recycled yarns and products, because in the beginning they were not so convinced”*. Supplier E viewed collaboration important because knowledge sharing, and collaboration created opportunities. Supplier B continued the same idea by saying that it’s up to the manufacturer to discuss about opportunities. They ask the vendor that could this be developed together, and the vendor starts to check their processes and possibilities.

“What happens a lot is that there is a demand from the market, they ask for more environmentally friendly products and it is not because the demand is there that the solution is already made.”

“They only want recycled anymore. So once they started, it’s like they get used to it and they want it and it’s growing automatically because there is demand for it.”

“It is clear that the search for sustainable products is also an important card in the technical textile sector. The market is increasingly attentive to environmental issues and rewards companies that are active in this field.”

Some of the suppliers push their vendors with questions they receive from the market. They view that there is a lot of demand from the market to offer sustainable products. According

to supplier C when they brought out new sustainable products to the market the interest grew. They started to receive a lot of questions from their customers. Their technical team needs to make the requirements from customers a reality, which is why they work closely with their vendors to provide the products that the market is demanding. Other suppliers also stressed that the push comes mainly from the market demand. Supplier C continued saying that it is not always the case because sometimes companies need to be the innovators to produce new sustainable products. Supplier G told that textile companies have to try new things, such as make a sustainable product, but sometimes they don't work for example the products do not perform as well.

All the suppliers monitor their vendors in some way, except supplier A that plainly stated that all of their suppliers come from industrialized countries in where respecting the humans and the environment is required by law. Most of the suppliers mainly visit their vendors regularly to detect any issues, generally once a year or two years apart. Monitoring vendors and seeing their processes are considered important, since checking the vendors is also a part of certifications such as ISO 14001. To note, the smaller suppliers that did not have the ISO 14001 also visited their vendors and one mentioned it is a regular thing to do in the industry. Supplier F started last year to require their vendors to have the ISO 14001 and are now in a point where all vendors are ISO 14001 certified. Using third-party certifications is one way to monitor vendors and to be assured that they are sustainable.

Eco-labels and certifications are a much-used tool in the textile industry. As seen in the Table 9. The suppliers have multiple certifications or/and eco-labels. Many of them are the same since they are most known and generally required in the European market. All suppliers have the Oeko-tex label which ensures that there are no harmful chemicals used in making the products (Oeko-tex 2021). This is especially important in upholstery textiles since many of the fabrics are treated with chemicals so that they will be more durable and last longer. In the interviews it was noticed that eco-labels were not used just to make the product and the material used in it more sustainable, but also the supplier's vendor to be more compliant with environmental issues. In other words, using a third-party certification or label is used as a tool to also make their supply chain more sustainable. Supplier C criticised the GRS

certification since to attain it the product needs to have 20% recycled material. According to them 20% is not enough to have a label since there is not so many recycled materials into it. This is one form of greenwashing that is accepted by the certification.

“According to the GRS certification we have to check all the supply chain, so all the processes coming from the raw material, finishing, storage and commercial.”

“It’s part of the Iso 14001 standard, its part that you monitor your supplier, so if you want to achieve that you have to monitor them.”

The suppliers use multiple ways to influence their vendors to be more sustainable. Visiting vendors and asking them frequently questions was a one way of promoting sustainability in the supply chain. Suppliers require sustainable materials from their vendors and try to work together to provide them to the market. Thus, supplier development is a tool that almost all of the suppliers said they are using. Supplier F has their own approach that they are implementing currently called the ‘playbook’ to help their vendors to be more sustainable and offer them easy sustainability practices to be implemented. The idea is that the vendors have tools to become themselves more sustainable. Furthermore, with the playbook they can make sure that their vendors actions are in line with their own. According to supplier E the textile industry’s environment has changed due to demand and regulations which is why many vendors that have not yet made many actions towards sustainability are now starting to line with it.

Finally, the interviewees were asked what challenges they see for the textile industry to become more sustainable, and many challenges were found. Sustainability in the textile industry is seen as a complex topic since textiles create many emissions. Minimizing the emission is seen important for most of the suppliers which can be seen in the modification of manufacturing processes. Many suppliers saw that one of the biggest challenges comes from the market. If the market does not want sustainable products, even if they produce a great sustainable fabric, they cannot continue producing or buying them. Important for addressing the challenge is to educate the customers about how the products are better for

the environment. Price was also seen as a challenge since sustainable textiles are higher in price. This is because the materials used in them are more expensive and there are more extra steps in the production process. For example, supplier C describes that when PET bottles are used for making polyester, the bottles need to be washed, cleaned, and separated since there are many types of bottles. This requires manual labour and processes specifically for it.

The future of recycled materials was seen as a challenge for supplier C and E. According to them there will be a high demand for recycled materials in the future and we will be needing even more of them. The problem comes from setting up systems globally to recycle materials and allocate them to use. According to supplier E this year was the first year in which they had trouble of finding recycled cotton from the market. The demand is high but there are problems in the processes of recycling materials. This is linked to other issue that the companies mentioned. In the future the textile fabrics must be recyclable for really closing the loop in the upholstery textile industry. This is challenging since many fabrics are made from blended fibres. In addition, recycling fabrics downgrades the fibre. Recycling is problematic especially in the upholstery industry since the fabric is not only one part of the product compound. As an example, the sofa that is disposed need to go in a special facility in where the sofa fabric is teared off and recycled. There is not yet facilities that tear the products apart and recycle the parts, including the fabric.

5.3 Sustainable upholstery textiles

Lauritzon has currently five textile products that are categorized as sustainable. These products have been launched in the company's own line called Greencare. Two have been in the production for the last two years and have been launched last spring. According to them there are other products that are on the way but due to issues in production they have not been yet launched on their site. One of the Greencare products that is made from recycled cotton, has been in their collection about a decade. The current products are made from recycled PET, recycled cotton and recycled polyester blends. All Greencare products are currently made entirely from recycled material. Greencare holds all products that the

company currently markets sustainable. This has been done to make it easier to customers to recognize sustainable products from their collection.

Lauritzon strives to become more sustainable in their actions and constantly look for new sustainable products and ways of doing things that could be improved. In other words, they are looking to increasing the number of sustainable products in their Greencare line. According to them almost all products that are currently in the design phase are made from sustainable materials. The products in Greencare are certified with GRS. According to the interviewee there are no certain eco-labels or certificates that the case company requires, excluding Oeko-tex and Reach which either one need to be in all products. In their opinion *“certifications and eco-labels that are widely known are good and having too many of them is confusing”*.

The interviewee tells that the change towards sustainable products in upholstery textile industry has been rapid. In 2019 there were almost non sustainable textile fabrics presented at fairs when two years later it was full of them. New products are coming all the time and there is a larger variety of them. Lauritzon’s customers have also been reacting well to new sustainable products and there can be seen a larger demand for sustainable upholstery textiles in the future. Though, still the most important aspect is what the fabric looks and feels like. Thus, according to Lauritzon sustainability is an aspect that is becoming to be in the same line as other traditional aspects that customers look at such as price and aesthetics. But in the end the textiles that they design, and purchase need to look fashionable since customers will not buy product if its only sustainable. In conclusion, sustainability is one aspect among the others, in many cases it is a plus if a fabric looks good and is at the same time sustainable.

Lauritzon’s aim is to be transparent to the consumer by giving answers what is the current situation in sustainability issues and how consumers can themselves determine what is the best material and the best way to do things for them. Customers have been starting to demand answers about how sustainable recycled or organic materials are compared to traditional virgin materials. To be able to be transparent and give answers to customers, Lauritzon must understand the sustainability aspects of their products. Furthermore, since in Finland it is

common for washing a lot of home textiles, the company is currently looking into washing bags that help to minimize microplastic pollution. For example, polyester is a material that sheds high amount of microplastic when it is washed in high temperatures. They also want to educate the consumer to be responsible in their own actions, since they cannot act on behalf of the customer, they can give knowledge on how to act and take care of their products as sustainably as possible.

5.4 Sustainable product design

Lauritzon designs textiles that have high quality and according to them they want to design products that are durable and look great. In other words, Lauritzon has their own style that they follow but they offer products according to market needs. New products are developed all the time and there are no specific product lines coming out regularly such as winter and summer line, which is typical for the fashion industry. In other words, in theory if an interesting product is found then it can go straight to production and come to the market a little faster because it does not have to wait for a whole line to come out. They see that coming with product lines would be possible in the future It would also be beneficial since then “*we could create a story behind the collection line*”. A specific characteristic that upholstery textiles have and what needs to be considered in the design phase is that upholstery textile products need to stand harsh cleaning chemicals and they are often used for many years and must be durable. Thus, sustainable products need to also meet these requirements.

Sustainable textiles start with the design process. If a textile company wants to become more sustainable, they must design products for sustainability. Based on the interview it can be concluded that sustainable textile fabrics are comparable to traditional fabrics. They are very similar in feel and look, though they might not have the same colours available that traditional fabrics have. Colour repetition and wide colour range is a challenge in sustainable textiles, since there is little use of chemicals in the production of them. As an example, recycled cotton products are made so that already dyed post-consumer cottons are divided by colour. The recycled textile’s colours are made from the existing colours of the fabrics,

which is why not all colours can be created. In addition, the colours are not always the same since there are no dyes used. This is a challenge in the design process since some compromises must be made or it takes more time to design the exact colour. The sustainable fabrics that Lauritzon currently has in their Greencare collection were chosen because of their great look. The interviewee though noted that it took a long time designing them because of the recycled material colours.

One difference to traditional textile products is that sustainable textile products are currently 10-15% more expensive than traditional products made from natural or man-made materials. This though can be a problem that could be solved in the future when there is more availability of them. Thus, price is an aspect that need to be considered and customers especially look at the price when they are buying a product. Being more transparent about why the price is currently higher can help the customer to understand the aspects that make a sustainable products price go up. Furthermore, according to the interviewee price is one of the aspects as sustainability is, which is why there should be not put too much weight on it.

6. CONCLUSIONS

The textile industry is receiving a lot of pressure from various stakeholders to become more sustainable. Textile companies have realized that they must act on sustainability issues, and procurement has noted to have a significant role in affecting the company's sustainability. By purchasing sustainable goods and using sustainable practices, the company can influence not only their own sustainability but also their supplier's. Tackling sustainability issues in supply chain is crucial since in the textile industry most of the sustainability issues happen in the manufacturer's end. In today's environment it is not beneficial to close eyes from sustainability issues and not be critical about supplier's actions. The main aim of this study was to provide procurement practices for an upholstery textile company to become more sustainable in their purchasing. Thus, both the supplier and the textile product they provide needs to be sustainable.

Sustainability is a wide topic in the textile industry, which becomes evitable in both theory and empirical part. In addition, the environmental part of sustainability is emphasized in both, which is in line with study made by Luthra et al. (2017). Social sustainability issues are very known in the textile industry in general but when talking about sustainable textiles they are not seen as important as environmental issues. This can be because many sustainable textiles are produced in industrialized countries when natural textiles are produced in developed countries. Environmental issues are emphasized since the industry is currently highly invested in lowering textile's environmental aspects with new technologies and product innovations. Especially recycled textiles were highlighted in both parts, notably in the empirical part when discussed about sustainable textiles. Roos et al. (2015) also mentioned that recycled textiles are the pathway for textile industry to become more sustainable. Thus, recycling a textile does not delete the fact that it will also create emissions when producing the recycled textile. Recycling textiles manually also lowers the textile quality, and many textiles are possible therefore to be recycle only once or couple of times. As Le (2018) and the empirical part noted, this creates a problem in the material quality and closing the textile loop. Thus, all aspects of the products qualities in both production and the product itself need to be considered when purchasing, which makes designing sustainable textiles a complex task.

There are many sustainable procurement practices presented in the theoretical part. In both parts especially supplier collaboration and supplier development were highlighted. They were seen important because collaborating and developing suppliers must be done in order to create sustainable textile products. This finding is in line with study made by Kääriäinen & Niinimäki (2019) which stated that collaboration is one of the key aspects for sustainable textile product creation. The empirical part mentions that the suppliers need to be pushed to become sustainable in their actions. Companies usually work with existing suppliers since changing a supplier can be difficult and require more resources than developing a supplier. In addition, eco-labels and certifications are used as a tool in the textile industry to make supply chains more sustainable. It became evident in the study that a lot of weight was put to eco-labels and certificates for example to detect sustainability issues and use them as guidelines. Similarly, Diekel et al. (2021) noted that eco-labels were highly used in textile industry to decrease the environmental burden that the company's production creates.

Upholstery textiles are characteristically different than apparel textiles. Furthermore, it is not straightforward answer what makes an upholstery product sustainable since there are many aspects that need to be considered. Both empirical and theoretical part of the study emphasizes the designer's challenges to design sustainable textiles. The biggest challenges lie in the designer's knowledge of sustainability aspects and the availability of materials, as was also mentioned in study made by Niinimäki and Karell (2019). Sustainable textiles in the upholstery industry is a fairly new phenomenon and the industry is rapidly changing towards sustainable products. Thus, why textile companies are modifying their businesses to be able to act to the market demand. Moreover, the willingness to act differs in companies due to the pressure the company receives to be sustainable.

6.1 Results for the research questions

This part of the study will summarize answers to the research questions that were introduced in the first chapter. The results for the research questions are drawled from both theory and empirical study.

The main research question was “*How should an upholstery textile company use procurement practices to support buying sustainable textiles?*”. Many different procurement practices are identified in the theory. Most of the practices are used for evaluating and assessing the supplier’s sustainability. The other part is promoting sustainability in the supply chain by developing and collaborating with suppliers. Collaboration especially is an activity that is crucial for being more sustainable in the textile industry since partnerships are needed to be able to create new sustainable products for the market. In textile industry specifically the evaluating of suppliers is done with the help of certifications and eco-labels. There is an abundance of these certifications and eco-labels which is why the company should choose the ones that are compulsory for suppliers to have and the ones that are alternative. The Figure 9. below summarizes how procurement practices should be used in upholstery textile industry and in which stages of the purchasing process.

Firstly, Code of Conduct should be used for ensuring supplier’s compliance to environmental and social sustainability issues. Code of Conduct is typically used at the start of the purchasing process, which is why in this case it is located as an action before the purchasing process takes place. The existing and new suppliers should be evaluated according to selected sustainability criteria. This way the suppliers can be measured and ranked according to how well they meet the criteria. The company should strategically decide these sustainability criteria that are required from suppliers. Without concrete criteria the suppliers’ sustainability performance is hard to measure and compare. As it has become clear in the theory and empirical part, supplier collaboration is very important for enhancing suppliers’ and company’s own sustainability. Collaboration can bring many benefits when creating a new sustainable product to the market. It can also be used as an activity to develop suppliers to be more sustainable in their actions.

When the purchasing process is in motion, the sustainability details of the fabric should be simultaneously checked with the technical details. In this part of the process, it is the easiest to receive the details. Thus, the details form needs to be simplified so that it is easy for the supplier to give the most important details. Finally, when the process is finished, the supplier’s sustainability performance should be regularly monitored. The monitoring can be

done by asking continuously questions from the supplier and using tools such as questionnaires. Systematically monitoring helps to find out how suppliers perform and improve in their sustainability actions. Monitoring should be done at least every or every other year.

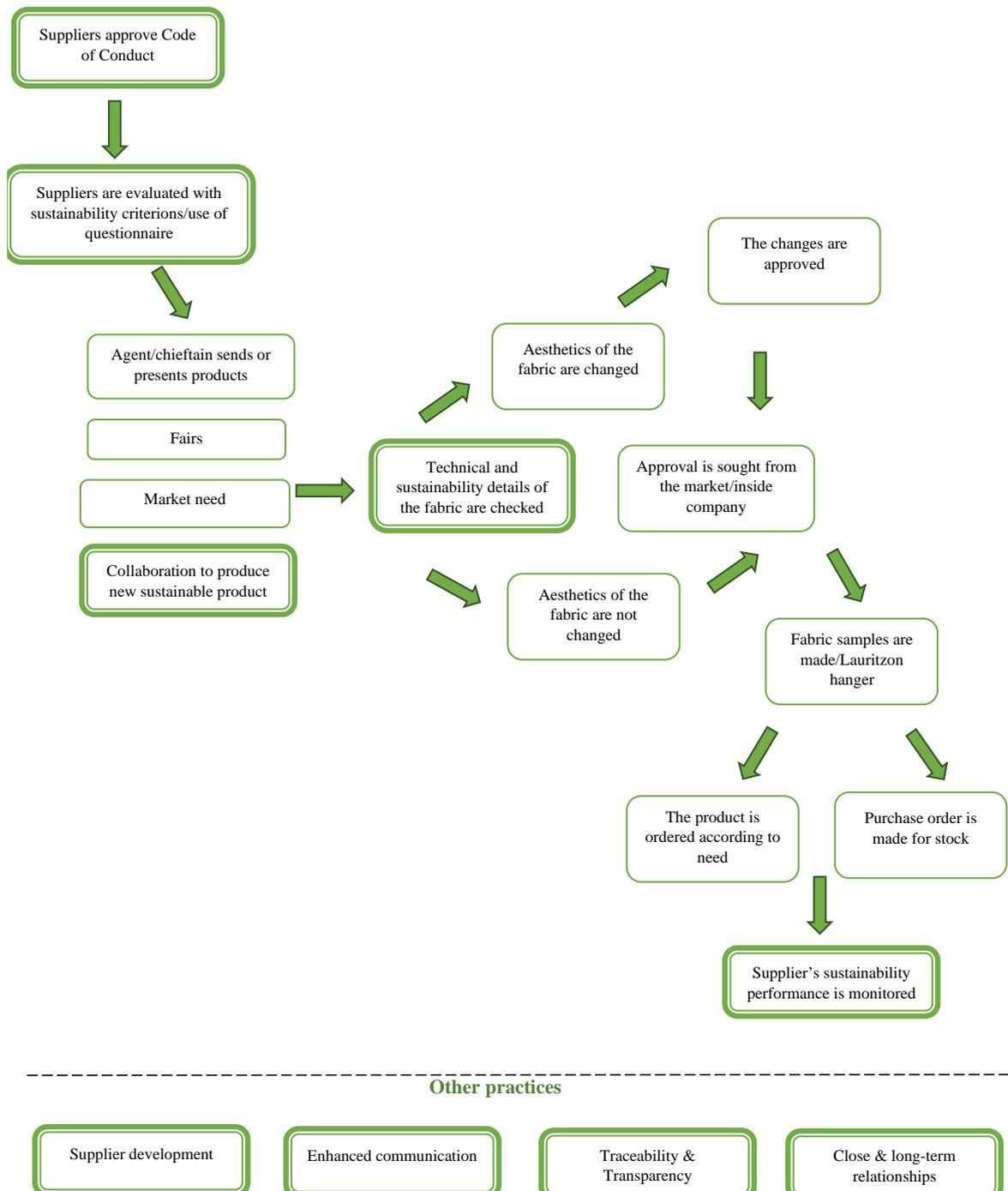


Figure 9. Procurement practices in upholstery textile purchasing process

Furthermore, there are other practices that enhance the succession of the introduced procurement practices. These practices are referred in the figure 9. as “other practices”. Using these practices throughout the buying process will help to create a sustainable supply chain. Developing suppliers to be more sustainable by requiring sustainability actions from them is a practice that has been noted to enhance sustainable supply chain in both theory and in empirical part. Better communication is also what is needed for receiving details about suppliers’ sustainability actions and issues. Without open communication it can be extremely hard to receive detailed information about suppliers and their vendors actions. In textile industry specifically traceability and transparency are key aspects of making sure the fabric that is bought is as sustainable as possible. Thus, this is one of the most difficult challenges to overcome. Hence, close relationships and enhanced communication are crucial practices to create a transparent and open environment.

The object of the first sub-research questions was to find out "*What are the elements of a sustainable upholstery textile?*". There is not one answer to what is a sustainable textile but finding the elements that make textile more sustainable can be helpful when looking at multiple different materials. For example, recycled material can be sustainable in terms of water and chemical use but if the production of the fabric uses a lot of energy, especially unrenowable, it downgrades its sustainability aspects. The fact is that all textiles create emissions during their life cycle. Ny optimizing all of the textiles sustainability elements it can be ensured that the textile is as sustainable as possible and therefore be marketed and labelled as sustainable. Figure 10. below summarizes the elements that need to be considered when evaluating fabric’s sustainability. It is the company’s choice which sustainability aspects are prioritized.

In manufacturing the textile, location is one of the key aspects when ensuring that the product is produced sustainably. As came clear in the empirical part, most of companies’ regulations about manufacturing waste, chemicals, worker’s rights and conditions comes from the national legislation. Furthermore, in developed countries these legislations are strict, and they are constantly evaluated. Thus, companies that work in areas which have strict regulations must naturally comply with them. The challenge is in countries that do not have

the same regulations. Thus, if supplier has their vendors working in developing countries, they have to continuously work towards lowering the possible environmental and social aspects that their textile production creates.

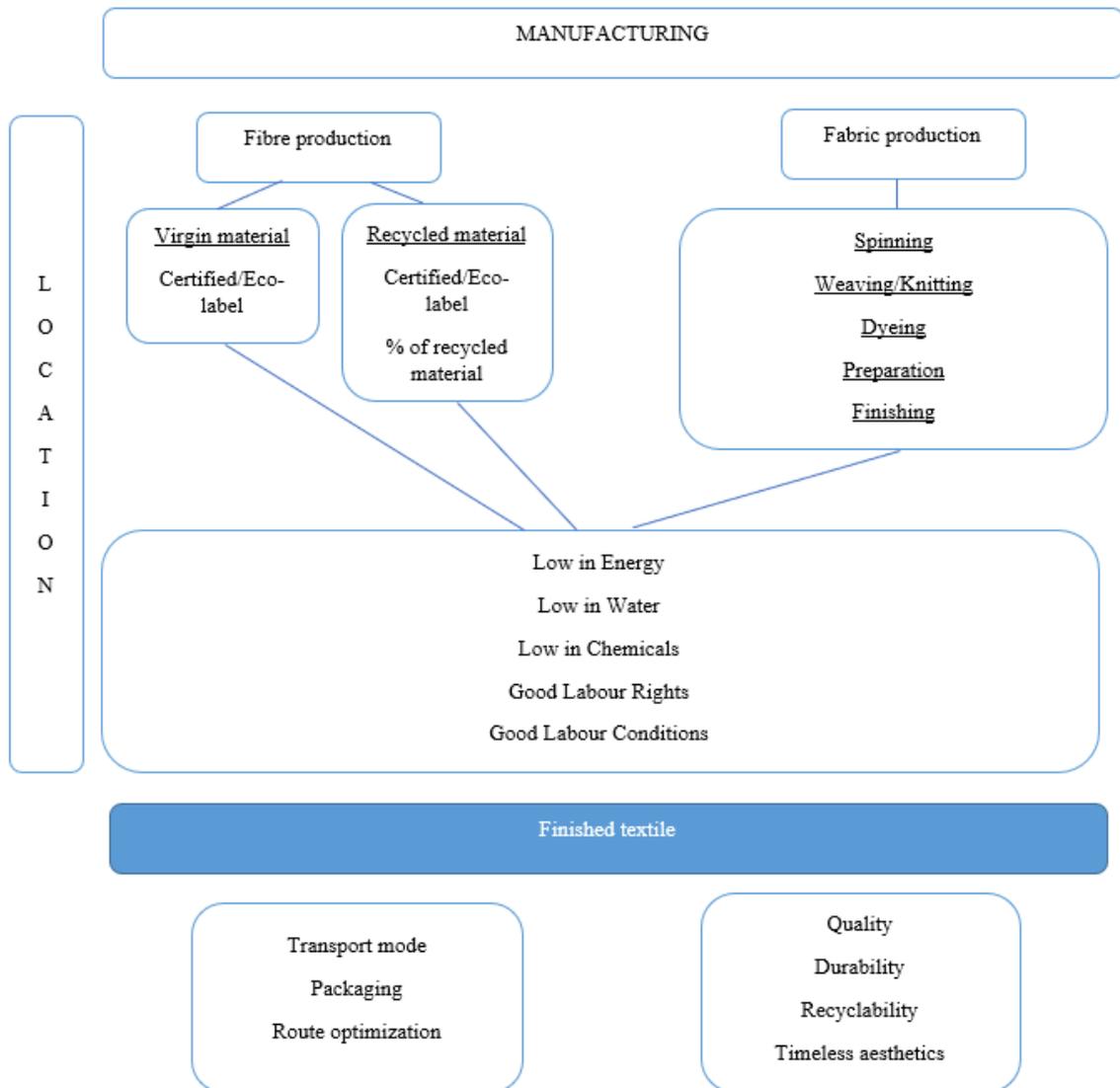


Figure 10. Elements of sustainable upholstery textile product

The fibre production is divided into natural and recycled material. Firstly, should be looked at if the material is eco-labelled or certified. In natural materials the best for sustainability would be that the materials are labelled organic or as better materials. Thus, this way it can be ensured that there are no harsh chemicals and the amount of water used is lower. In man-made fibres it would be the best if those would be made from renewable and biobased

materials. In recycled fabrics the amount of recycled material should be looked at. The percent of recycled material should not be lower than what is the company's criteria. The fabrics should be made so that energy, water, and chemical use is optimized as lowest as possible. In addition, the fabrics should be made so that throughout the whole manufacturing process labour rights and conditions are appropriate.

The social aspects are hard to put into valuation since they are not measurable in the same way as environmental. Thus, it does not mean that they are not as important. Certifications and eco-labels help to ensure that also the social issues in manufacturing are taken care of. Furthermore, the company should be critical about social aspects and look for suppliers that have social certifications. For example, they should require from their supplier to tell them the locations where the raw material comes from. Sourcing from countries that are known for having great working environment is one way to lower social risks in textile production. In addition, close relationships, and open communication with joint interest on addressing social issues is a way of ensuring the textile products are socially sustainable. Furthermore, in some countries monitoring is a mandatory practice to use since actions can be more trusted than words.

When the textile is produced as sustainably as possible in a location that support sustainable production and is as close as possible, other aspects need to be looked at. The transport mode should be chosen so that it is the best sustainable option for transporting the product from a certain country. In addition, the finished product should be delivered with a route that is the most straightforward with using route optimization. The packaging of the product should be environmentally friendly as well as the product itself. This can be hard since the transportations are often offered to the customer. Thus, the company should communicate and work with their supplier to provide the most sustainable option for transportation. After new innovations and better transportation modes become available, the company should adopt them.

As mentioned in the theory and empirical part, the quality and durability are very important aspect in the upholstery industry. These aspects should not be overridden as they are just as

important as other sustainability aspects. If the product that is made with sustainable material cannot stand the appropriate use, then it is not as sustainable anymore. The products should be made so that they are also recyclable, and this will become more important in the future when upholstery textile recycling is solved. As came up in the empirical part, the product should look fashionable even though they are produced as sustainably as possible. The following sustainability aspects affect how the consumer uses the product and how long. If a textile product is used many years, it will be even more sustainable. This is up to the customer but creating timeless products will help the customer to use the product for a long time and not to feel pressure that it goes out of style.

The second sub-research question was to find out “*How to ensure supplier’s environmental and social sustainability?*”. As mentioned in the empirical part, all of interviewed suppliers had done sustainability actions, some more than others. The Figure 9. “Procurement practices in upholstery textile purchasing process” presents the key aspects in ensuring that the supplier is responsible in their actions and processes. The practices that were highlighted in the purchasing process help to ensure that the suppliers are sustainable. Code of conduct is a very standard and great practice to use but to make sure that the suppliers are complying with it, they should be also monitored. As Hoejmosé & Adrien-Kirby (2012) stated this where many companies fail when using the code of conduct.

If there is good communication between both parties it is more likely that they will be willing to share information. One of the most important steps to ensure and evaluate suppliers is to set up the company’s sustainability criteria, both environmental and social. The criterions are minimum sustainability aspects that suppliers need to currently fill or move towards, for example the ISO 14001 certification. Setting up criteria is important in both evaluating existing and sourcing for new suppliers. The criterions also help to systematically put in place sustainability practices since putting them down makes them clearer. The sustainability criterions can be then furthermore communicated to the customer. Without concrete criterions it can be very hard to assess and ensure that the supplier sustainability performance is at an appropriate level.

The third sub-research question was “*What are the challenges of going towards designing and purchasing of sustainable textiles?*”. There are many challenges that can be identified internally and externally. Internal challenge is the willingness to accept that sustainable product cannot perform exactly the same as virgin products. There might be some aesthetics and aspects that need to be currently compromised since sustainable products are not performing completely the same, for example they do not have the exact colour repetition and colour scheme as virgin materials. The gaps in knowledge about sustainable textiles can also be seen as a challenge. It can be hard to assess what are the sustainability aspects of each textile product and compare them if there is no latest knowledge about how much environmental and social impact the textiles create.

One big external challenge is the complexity of the textile supply chain and supplier transparency. For a textile company that buys finished fabrics it can be challenging to trace the products supply chain and detect issues. Since the production happens in the suppliers end it is sometimes hard to know exactly how the products create emissions and what processes are used for making them. Some suppliers are more willing to be transparent and talk about sustainability issues than others. In addition, sustainability is still not seen as the most important priority in some textile companies, though they do understand the issue. Therefore, close relationships, clear communication, transparency and collaborating with suppliers is a key tool to get the information. Since textile supply chains are large and complex, sourcing more locally can be the solution for making the supply chain easier to trace and manage.

One of the external challenges comes from the market demand and market reaction to sustainable products. If the market is not willing to purchase the products it would not be beneficial for a company to design them since they also need to make profit. The key is to educate customers about how and why the sustainable textile product differ for example in colour and feel. Educating the customer about textile’s sustainability aspects is the key for also boosting the market demand for these products. When customers are more informed, it will more likely to affect their purchasing decision. The market for sustainable materials is also a challenge that the interviewees stressed. This can affect the future prices of the

products either negatively or positively if the sustainable textile market starts growing faster than the demand. This needs solutions both locally and globally.

6.2 Suggestions for action plan

In this part of the study an action plan is suggested to help the company go towards buying more sustainable fabrics. The market is currently demanding for sustainable textile products and the company needs to be able to also justify why these specific sustainable products are sold. Based on the findings, the company should make a step-by-step strategy to become sustainable in their buying actions. Since there are many things concerning sustainability, devouring them all at once is not the most beneficial way. Additionally, for to be able to create a story for the customers they should have sustainability actions that can be justified. Furthermore, the company should create a business model that supports actions towards sustainable textiles. Moving toward sustainable products is a strategic decision and needs a systematically structured approach. Because of this “Steps for sustainable upholstery textile buying” (Figure 11.) was created to help the company to succeed in buying sustainable textiles.



Figure 11. Steps for sustainable upholstery textile buying (modified: European Commission 2015)

Firstly, critical environmental and social points need to be found and then furthermore targets for them need to be made to help in the decision making. For example, choosing another fabric rather than another because the supplier meets the company's sustainability criteria and uses less water in the processing of the fabrics, is a way of taking the critical aspects into consideration in the buying process. When the critical points have been found, the design should take into consideration the sustainable aspects and design for sustainability. Designing for sustainability means that the fabric is made from sustainable materials, it is durable, aesthetically timeless, and preferably recyclable. In the buying process the sustainable procurement practices presented in Figure 9. will help to ensure that the supplier is sustainable and furthermore meet the sustainability criterion. Finally, the process should be monitored and assessed to find ways to improve buying more sustainably.

As an example of finding the critical points, Kalliala and Nousiainen (1999) noted in their study that polyester and cotton have specific characteristics and thus, cannot be objectively compared. This goes to other fibres as well which means that there is no right answer when deciding which sustainable textiles to design and buy. The textiles should be chosen based on the needed design, characteristics, and environmental aspects. If we take polyester as an example: the design requires strong fibre which is chosen to be polyester because of its characteristics. As a sustainable alternative to virgin polyester the designer can choose recycled polyester. Furthermore, a supplier that makes recycled polyester using renewable energy is chosen. By minimizing the negative environmental aspects of the chosen fibre material and the supplier's activities, the company is being more sustainable. Firstly, the designer needs to know which negative environmental aspects in the textile fibre chosen should be deleted or lowered. Thus, this can be hard to do because designers generally do not have all the knowledge of the production process which is why suppliers should be conducted. This is where Figure 10. "Elements of sustainable upholstery textile product" can help.

Going toward designing and buying sustainable products in the textile industry is not easy to start because it needs many changes to be done inside the company, especially in the mindset of employees and the business model. Doing business sustainably must be rooted in

the company's actions. This does not happen in a day, and it is a process that needs constant reminders and work. In the upholstery textile industry, it also has to be noted that being 100% sustainable is not currently possible since there are many problems such as the products are not recycled like apparel products. Companies should work on sustainability issues all the time since new issues arise when the other ones are being handled. One possible change in the business model towards more sustainable approach could be looking at the current products and a way that they could be produced more sustainably.

6.3 Limitation and suggestions for future research

This study has several limitations that are discussed in this chapter. Firstly, this research is focusing on environmental and social sustainability, excluding the economic one. Thus, including all of the three aspects of the triple bottom line would be considered as true sustainability. Both environmental and social sustainability concepts are very wide, and this study could not cover them extensively, but when buying textiles, it is important to take both aspects into account since the nature of the industry. Thus, the economic part of sustainability was excluded because it would make the study too overwhelming. In addition, the environmental and social sustainability part of thesis will focus on the manufacturing of the textile, which is in the start of the life cycle, therefore excluding the end of the life cycle view.

Secondly, the research in the textile industry has commonly been towards fast fashion and the clothing industry that is known for being very unsustainable. This study is limited to upholstery textile industry which differs from fast fashion and can be seen slower and more focused on quality products. The study is limited to suppliers from certain countries and specific textile manufacturers and editors. Textile manufacturing risk differ in different countries and manufacturers have several different methods to make textiles which is why results are hard to generalize. The focus of the study will be mostly on first-tier suppliers which makes the supply chain sustainability view limited. The study is also limited to the one case company and the company's size might limit the results further since it is a small family-owned company that does not yet have a sustainable supply programme in place.

Furthermore, the study is limited to the most produced and general textile materials that came up from the study.

With all the limitations mentioned above, it can be stated that the results of the study are hard to generalize. Thus, this study could support another upholstery textile company that is also starting to become more sustainable in its buying practices and advise them on what the critical points in the industry might be and what is the situation in some upholstery textile manufacturing companies. It can be helpful since the problems in the industry tend to be repeatable as can be seen from the empirical part. To note, the first-tier suppliers that attended the research were generally all sustainable in their actions which might be because the case company values quality products and quality suppliers tend to be responsible also in their own actions. Thus, the suppliers were from developed countries that generally have strict regulations and customers that drives them toward acting sustainable.

Since the study is focusing on only the manufacturing part it would be interesting in the future research to see what the potential for upholstery textile recycling and after-use is. When the production process of the fabric is as sustainable as possible, the next step would be to look at the use and after-use of the product. As mentioned in the empirical part, textile companies see that in the future this is something everyone needs to consider and work towards. This is hard since there is not much visibility to how consumers use and get rid of their products and in what stage of the products life. There are not many systems yet for recycling furniture product, though there is a large second-hand market for them. Furniture recycling requires many problems to be fixed, since furniture products have other parts in it than just the fabric. Recycling also depends on the country's national legislation and systems, which is why it can be challenging for multinational companies to find out how their products are recycled when they are scattered across the globe.

It would be also interesting to see after chemical recycling becomes commercialized how upholstery textile companies adopt them, since interestingly now none of the interviewed suppliers did not mention the future of chemical recycling and its possibilities. Chemical recycling can potentially solve many problems that are mentioned in the interview results

such as price and availability of the recycled textile material. Research about chemically recycled compared to manually recycled textiles could be interesting in terms of how it could solve problems that manual recycling face, such as poor quality and repeatability issues. Chemical recycling could furthermore help with keeping the recycled materials in the loop since it does not downcycle the textile products.

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INTERVIEW QUESTIONS

General questions

1. What is your position in the company?
2. How would you describe sustainability?

Textile sustainability

3. How social and environmental sustainability appear in the company's strategy? Do you have goals and targets for sustainability?
4. How would you describe sustainable textile product? (eg. recyclability or specific material) What sustainable textile materials do you have?
5. What actions have you taken towards environmental sustainability in the company? What about social?
6. How do you take into account harmful emissions that come from textile production (eg. waste water, CO2 emissions/energy)? How do you manage them?
7. Do you make life cycle analyses, if not do you see then necessary?
8. What is your knowledge where does the textile material originate from? What about the production of raw materials?
9. What kind of packaging and transportation do you use?
10. How do you support your workers in terms of health, safety and fair compensation?
11. How do you take into consideration your supplier's working conditions?

Sustainable procurement practices

12. Can you describe your purchasing process briefly?
13. Do you use Code of Conduct and if yes, how it is used?
14. Do you accept Lauritzon's Supplier Code of Conduct as a whole, if not which part is not accepted and why? (Appendix 1)
15. How important you see collaboration in terms of sustainability and new sustainable product development?
16. How does sustainability appear in your supplier selection?
17. Do you promote sustainability in your supply chain? How?

18. Do you monitor how your suppliers meet environmental requirements? What about social requirements?

19. What are the challenges of becoming more sustainable in the textile industry?

LAURITZON KYSYMYKSET

1. Mistä idea Greencare mallistolle lähti?
2. Milloin ensimmäiset kestäväksi luokitellut kankaat tulivat markkinoille? Miten markkinat ovat reagoineet niihin?
3. Ovatko kestäväksi luokitellut kankaat tällä hetkellä hyvin verrattavissa neitseellisiin?
4. Kuinka paljon Lauritzonilla on tällä hetkellä kestäväksi luokiteltuja kankaita? Miksi valitsitte juuri nämä kankaat?
5. Miksi tietyt toimittajat ovat valittu, joilta ostetaan tällä hetkellä kestäviä kankaita?
6. Koetko että kestäviä kankaita on hankala tunnistaa ja luokitella?
7. Mitä haasteita on kestävä kankaan suunnittelussa?
8. Miten ”kestävämmin” suunnittelu vaikuttaa suunnitteluprosessiin?
9. Onko kestäväksi luokitelluissa kankaissa koettu joitain ongelmia suunnitteluvaiheessa?
10. Mitä haasteita näet siirtymisessä enemmän kestävien kankaiden suunnitteluun ja ostamiseen?
11. Miten näet kestävien kankaiden tulevaisuuden? Kasvaako niiden osuus merkittävästi seuraavien vuosien aikana Lauritzonilla?
12. Mitkä eco-merkinnät ja sertifikaatit ovat Lauritzonille tärkeimmät tällä hetkellä?

LAURITZON'S CODE OF CONDUCT

Lauritzon's Code of Conduct aims to set up requirements and principles that are to be implemented in its supply chains. Lauritzon is committed, in its operations, to responsible and sustainable business.

Lauritzon's Supplier Code of Conduct contains, as applicable, the minimum ethical and environmental guidelines that apply to our partners. As one of our partners, you must ensure that these principles are implemented **throughout your supply chain right up to the origin of the product**. On request, Lauritzon has the right to detailed information about the whole supply chain, the origins of the products, raw materials and operations.

This Code of Conduct is made in reference to Business Social Compliance Initiative principles and is based on international conventions and principles, such as the Universal Declaration of Human Rights, UN Guiding Principles for Business and Human Rights, International Labour Organization's conventions and recommendations.

COMPLIANCE WITH LAWS

Partners must comply with the laws of the applicable legal system(s).

ETHICAL BUSINESS BEHAVIOUR

Partners must not tolerate no form of and not to engage in any form of corruption or bribery. Partners should also strive to avoid any conflicts of interest arising in their operations.

LABOUR AND HUMAN RIGHTS

Worker's Rights

Partners should have written employment contracts with all employees. Employment contract must be written in the local language and include the employment terms and conditions.

No Bonded Labour

Partners should not have any forced, bonded or non-voluntary labour. All workers should have the right to leave work and terminate their employment without any punishment by giving reasonable notice to the employer.

No Discrimination

Partners shall not discriminate employees because of their gender, age, religion, race, caste, pregnancy, disability, social background, sexual orientation, political opinion, membership in unions, diseases or any other condition that could be upsurge as discrimination. Furthermore, workers shall not be harassed or disciplined on any of the grounds listed above.

No Child Labour

Partners shall not employ directly or indirectly, children below the minimum age of completion of compulsory schooling as defined by law, which shall not be less than 15 years of age. In removing children from the workplace, business partners should identify in a proactive manner, measures to ensure the protection of affected children. When appropriate, they shall pursue the possibility to provide decent work for adult household members of the affected children's family.

Protection of young workers

Where young workers are employed, partners should ensure that (a) the kind of work is not likely to be harmful to their health or development; (b) their working hours do not prejudice their attendance at school, their participation in vocational orientation approved by the competent authority or their capacity to benefit from training or instruction programs.

Fair Wages

Partners shall respect their workers the right to receive fair remuneration that is sufficient to provide them with a decent living for themselves and their families, as well as the social benefits legally granted, without prejudice to the specific expectations set out hereunder.

Partners shall comply, as a minimum, with wages mandated by governments' minimum wage legislation, or industry standards approved on the basis of collective bargaining, whichever is higher. Wages are to be paid in a timely manner, regularly, and fully in legal tender. The level of wages is to reflect the skills and education of workers and shall refer to regular working hours.

Deductions will be permitted only under the conditions and to the extent prescribed by law or fixed by collective agreement.

Decent Working Hours

Partners shall ensure that workers are not required to work more than 48 regular hours per week. Overtime work must be exceptional, always voluntary for employees, and compensated in accordance with national legislation in the worker's country of operation. Overtime hours should never exceed 12 hours per week. Furthermore, partners shall grant their workers the right to resting breaks every working day and the right to at least one day off every seven days.

Health and safety

Partners shall ensure a safe and healthy work environment for all employees. Partners shall comply with occupational health and safety regulations, or with international standards where domestic legislation is weak or poorly enforced.

Partners shall ensure that there are systems in place to detect, assess, avoid, and respond to potential threats to the health and safety of workers. They shall take effective measures to prevent workers from having accidents, injuries, or illnesses, arising from, associated with, or occurring during work. These measures should aim at minimizing so far as is reasonable the causes of hazards inherent within the workplace.

Partners shall ensure continuous access to drinking water, safe and clean eating and resting areas as well as safe cooking and food storage areas.

ENVIRONMENTAL SUSTAINABILITY

Partners must respect the environment and comply with all environmental legislation in the country in which they operate. Partners must have relevant environmental permits for their operations. Partners should strive to actively reduce the environmental impact of their operations.

Water

Water resources must be used as efficiently as possible. Partners must ensure that all wastewater is treated and disposed of according to the local national legislation.

Waste

Partners shall work to eliminate or reduce solid waste, wastewater, and air emissions as well as improve resource efficiency and to reduce waste in their production. All waste must be taken care of following the local national legislation. Lauritzon strongly advice that all waste should be recycled.

Transportation and Packaging

Transportation and packaging should be handled as efficiently as possible to reduce emissions. Lauritzon strongly advice that partners should use packaging made from recycled, renewable or environmentally friendly materials. Lauritzon strongly advice partners to continuously look and offer for more sustainable ways of transporting goods.

I have read and commit to the principles of the **Lauritzon’s Code of Conduct**. By signing I take the responsibility to inform to my best efforts all subcontractors about it to secure their possibility to comply.

Place and date

Company name

Signature

Title
