Master's degree thesis

LOG950 Logistics

Sustainable procurement processes within Norwegian workwear and outdoor clothing brands

- A multiple case study

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Preface

With this thesis, we mark the end of our time as master students at the Master of Sciences in Logistics program at Molde University College. Our motivation for this thesis comes from a deep interest in both sustainability and procurement. This has been a long journey for us, starting early in the autumn of 2019 with many months of planning and brainstorming. Back then, our work seamed overcoming and straightforward, but like most things in life, it was not. This academic journey has taught us many things: discipline, curiosity, purposefulness, and pure determination most of all.

There are many who provided help during our work, and many to thank. Especially the eight participating companies. We are grateful for the time and effort you put into attending the interviews and answering our many questions. We also want to thank our talented supervisor Morten Svindland. In addition, we want to thank Deodat Edward Mwesiumo and Geir Arne Svenning for providing valuable help, and Nina Pereira Kvadsheim for the initial work with the proposal of the thesis. We also wish to thank Roar Lervik for proofreading and discussing our interview guide. Sebastian wishes to thank his girlfriend Vanessa for keeping up with his variable interest for chores at home and for her support during this demanding time.

To gain a higher response rate we promised each interviewee that we would donate 200NOK per interview to support The Red Cross' work for the children in Syria. Therefore, we are proud to announce we are giving The Red Cross a total of 1.600NOK.

Finally, we wish to thank each other for fruitful cooperation and many joyful moments together.

Alla dessa dagar som kom och gick, inte visste jag att det var livet.

- *Stig Johansson*

02.06.2020, Molde

Joachim Mulen Saugstad & Sebastian Gustafsson

Summary

The main purpose of this thesis was to investigate the current state of the sustainable procurement processes for the clothing industry, with an extensive focus on Norwegian producers of outdoor and workwear segment. Based on a theoretical framework of existing research on the topics we conducted a solid base layer for our work. We conducted semi-structured interviews, divided evenly between workwear and outdoor segment to gain first-hand information. There, we uncovered how the two categories distinguish from one and other, but also found opportunities for the industry which can be utilized if successfully implemented.

Design/methodology/approach: Our thesis was using qualitative primary data, a total of eight semi-structured interviews gave us useful insights into managerial decisions for supplier sourcing. In addition, a larger Norwegian survey provided us with useful quantitative secondary data.

Findings & Discussion: Moving production closer to the focal firm ad transparency to the supply chain and gave more control and predictability. With the use of leagile and LCA, the companies could both gain better insights into the environmental impacts of their product. While at the same time be flexible to swift changes in demand, and keep their safety stock to a minimum, hence increase their profit.

We conclude how Norwegian firms are doing, depending on the customers and their segment.

Finally, we give managerial suggestions and give ideas for further research.

Keywords: *supplier selection criteria, supplier monitoring, sustainability, life cycle assessment, textile industry, clothing industry, sustainable procurement, procurement processes*

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List of abbreviations

CEO Chief Executive Officer

CFO Chief Financial Officer

CO_2 Carbon dioxide

CoC Codes of Conduct

CSR Corporate Social Responsibility

EHS Environment, Health and Safety

EU European Union

GOTS Global Organic Textile Standard

ISO International Organization for Standardization

IT Information Technology

JIT Just-In-Time

LCA Life Cycle Assessment

PVC Polyvinyl Chloride

QR Quick Response

RQ Research Question

SETAC Society of Environmental Toxicology and Chemistry

SP Sustainable Procurement

SteP Sustainable Textile and Leather Production

U.K. United Kingdom

U.S. United States

UN United Nations

1 Introduction

1.1 Relevance of the topic

In the article *The Tragedy of the Commons* by Hardin (1968), the author describes the difficulties of dealing with overpopulation and overconsumption. Further, the author discusses how goods and land should be divided among the population, comparing greedy production with the sharing of resources, or the absence of it. Hardin mentions negative risk externalities like pollution and damage to the environment because of the overconsumption. These topics are issues this thesis aims to address.

Today, people all over the world are more aware than ever of the fact resources are scarce and that it needs to be considered when producing. Still, consumption all over the world is ever-increasing and the question is how to best make the most of the resources available. In the U.K. for instance, around 300.000 tons of clothing is reported to be sent to landfills or incineration plants every year (Spray 2019). Considering a population of just about 67 million people, this accounts for approximately 4,5 kilograms per person. A report by Ellen MacArthur Foundation states that of all fast-fashion clothes sold, more than half is disposed after a year (Herrmann 2017).

A big trend for companies in the western world is to be sustainable. In a report from 2018 by Global Fashion Agenda and The Boston Consulting Group, 52 per cent of the companies asked in a global survey of 90 participants from the clothing industry said that "sustainability targets acted as a guiding principle for nearly every strategic decision they made" (Kerr and Landry 2017). According to United Nations Conference Trade and Development, the clothing industry is responsible for more carbon emissions compared to the shipping and flight industry combined (Comtrade 2020).

Reasons to narrow the research down to the procurement process come from the fact that procurement as a process often has a big impact on the business. The procurement process is important because the company's procurement of goods and services can typically account for 50-70% of total costs and in some cases as much as 70-80%, depending on the

industry (Ryals and Rogers 2006). Clothing producers and wholesalers are dependent on purchasing large numbers of fabric and components every year, which makes procurement a strategic priority for them (Kerr and Landry 2017). This makes it interesting to analyse the procurement process of companies in this industry. Daudin and Kadjar (2010) carried out a study, asked 125 companies to ranked sustainable procurements' importance in the global supply chain. 64 per cent emphasized Sustainable Procurement (SP) to be of high importance regarding global responsibility and their sustainability strategy.

According to Rafi-Ul-Shan *et al.* (2018), the clothing industry is characterized by fast-paced dynamic nature with volatile demand, having many suppliers often in third world countries. It is a later trend that the companies use a smaller number of key suppliers to better manage social and environmental issues. The clothing (fast-fashion) industry has a reputation to be an industry that affects the environment in a negative way (Cattermole 2016). Many of the environmental and social issues in the clothing industry, such as environmental spillage, chemical pollution, water pollution, and heavy water usage often occurs at the supplier (Cattermole 2016). Some clothing brands have taken action to become more environmentally friendly and to reduce their use of new materials. The brand Patagonia has been a pioneer concerning this matter for many years. For instance, all their cotton used in production is of Global Organic Textile Standard (GOTS), meaning it is organically certified, and they also use reused and recycled materials to a large extent (Wolfe 2017).

Motivation to write about the clothes industry comes from previous cases showing that the industry can be harmful to the environment (Herrmann 2017; Comtrade 2020). This thesis will examine environmental sustainability in the procurement process. Although there is a lot of research concerning sustainable procurement, the literature typically deals with the topic from a public procurement perspective. To the author's knowledge, there is no literature on multiple case studies conducted on the implementation of sustainable procurement within the clothes industry in Norway.

The elements mentioned earlier, together with more environmentally conscious consumers, demanding even more sustainable products, forces companies to adapt their strategy towards greener products. Still, to what extent are companies embracing these new demands? What is the benchmark in the industry and are there any leading examples?

There are reasons to believe there is considerable potential for many other companies following in the same footsteps as Patagonia. Yet, what is the status quo among the medium-sized clothing firms in Norway, and what is the potential for the industry? What could affect their procurement policies considering a more sustainable approach? This is the main objective of the research pursued in this thesis.

1.2 Research gap

The thesis follows a qualitative methods approach, conducting in-depth interviews, and comparing the results with a review of relevant literature as well as secondary data in the form of a national survey. Elkington (1998) links sustainability to have an economic, environmental, and social aspect. This research will primarily limit itself to the environmental and economic dimensions of sustainability. When selecting suppliers and considering offers, Kalubanga (2012), underlines that companies should involve sustainability issues in their contract evaluation strategy. This thesis tries to find out whether the companies studied, have environmental sustainability measurements in the procurement contracts.

Kalubanga (2012) also stresses the need for more empirical studies, linking SP practices to other related practices, such as green logistics management, green warehousing, and social accounting, where these practices are mentioned as examples. Which is one of the supporting reasons to include the principles of leagile and LCA in this thesis, as well as the link between environmental sustainability and LCA. Walker, Di Sisto, and McBain (2008) analysed the drivers and barriers for the implementation of sustainable procurement for both the public and private sectors. The authors emphasize that more research needs to be done regarding small and medium-sized enterprises.

The authors of this thesis have found that most articles within the field utilize a single case study from other countries or a study on public procurement. Thus, there seems to be a gap in the literature concerning sustainable procurement in Norway, especially with regards to the commercial market. Consequently, the thesis has a main research question accompanies by a set of sub-questions formulated as follows:

1.3 Research questions

How should Norwegian manufacturers of outdoor and workwear clothes manage environmentally sustainable procurement in their supply chains?

- What are the criteria considered on environmental sustainability while choosing suppliers?
- How are environmental sustainability criterions followed up by the focal firms?

1.4 Background

This chapter presents a deeper level of the background for our choice, with a presentation of the fibres and their supply chains for a purpose to fully understand the product and its context. The production of clothes has changed during the last two decades, nowadays clothes are often produced far away from western markets where they are sold. First, the procurement process of clothes and supply chains for Norway is presented and, is followed by a section of fibres used by the companies interviewed in the thesis. Lastly, a section containing the supply chain for both cotton and wool and synthetic fibres are presented.

1.4.1 Background to the history of supplier strategy for clothes

Textile and apparel production has changed a lot during the twentieth and twenty-first centuries. Globalization, buyer-driven demand, consolidation of production seem to be the forces why we have seen a move from clothing production throughout the world to more specialization of production in for instance China (Appelbaum 2008). The end of the 30-year long Multifibre Arrangement with its quota system involving 140 countries has also contributed to a fairly more concentrated market, namely a market-driven by economies of scale (Appelbaum 2008).

In 1998 (ref. Figure 1) China was the biggest exporter of apparel to Norway, accounting for around 27 per cent of Norway's import, followed by Italy 11 per cent, and then by Denmark, estimated to about 10 per cent, and in fourth place, Turkey around 5 per cent. Twenty years later, in 2018, things have changed (ref. Figure 2). China was still the largest importer of apparel to Norway, but now accounting for around 40 per cent of the total

import. Now Bangladesh was the second-largest importer, in third-place, Turkey, and in fourth place, Lithuania (Comtrade 2020).

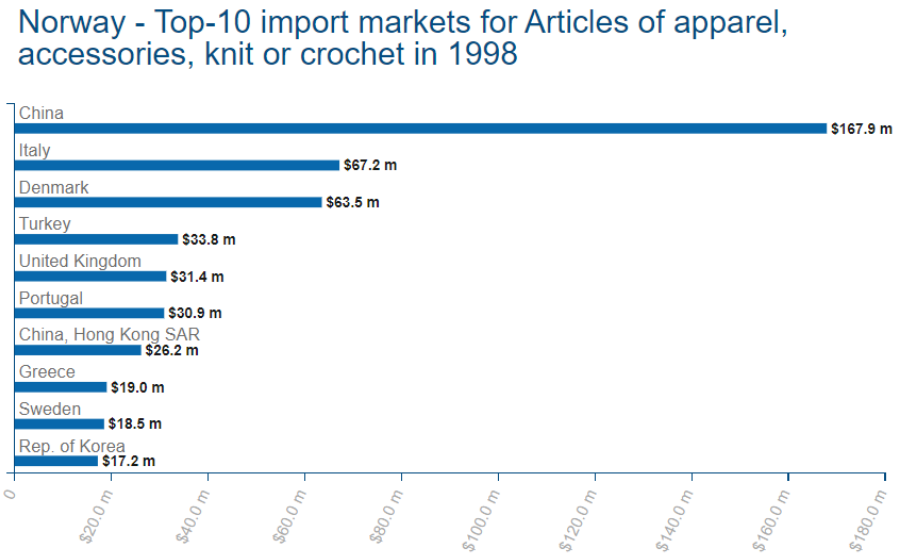

Figure 1: Norway's top-10 list of importers for clothes in 1998 (Comtrade 2020).

1.4.2 Fibres used in clothes

Today's clothes consist of many types of materials. One could distinguish the most common fibres used in clothes as natural and synthetic fibres. Natural fibres come, as is indicated, from nature and could be considered as renewable resources. There is also recycled fibres which could be produced by for instance old fibres made from cotton or wool (Committee 2019). Cotton and polyester are the most common fibres, accounting for around 80 per cent of the users worldwide.

Synthetic fibres are often divided into the categories' plastic and plant materials. Plastic materials are polyester, polyamide and acrylic. Synthetic fibre is less water-intense to produce compared to cotton. Most plastic materials made in clothes comes from virgin plastic, meaning it is not made from melted plastic but comes from newly pumped oil. This oil requires tremendous amounts of energy to be extracted (Saicheua, Cooper, and Knox 2011). A study from 2011 describes synthetic fibre to be accountable for around 61 per cent of all textile fibres produced (Muthu 2014).

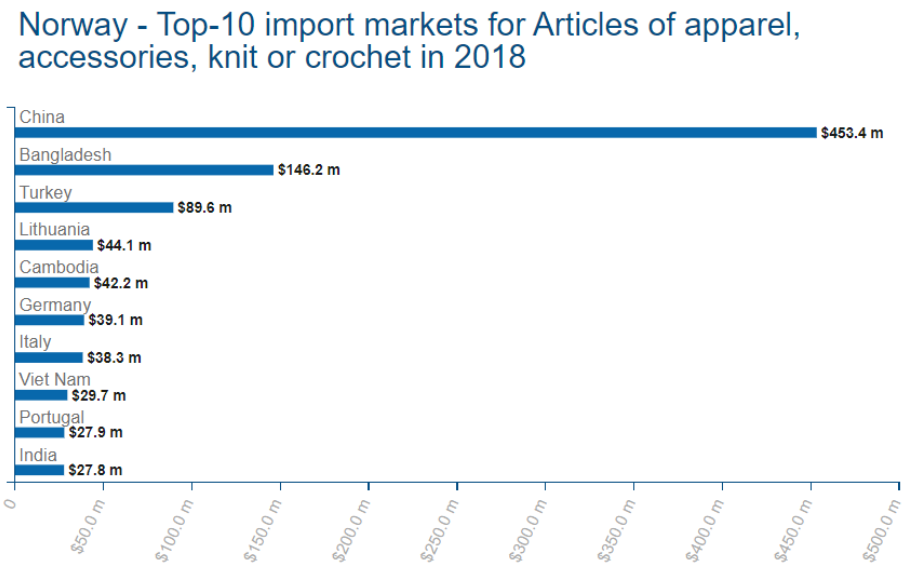

Figure 2: Norway's top-10 list of importers for clothes in 2018 (Comtrade 2020).

Natural fibre consists of either plant or vegetable fibre, from cellulose, or animal fibre, primarily from wool and silk (Muthu 2014). Cotton is the most used natural fibre of today's textile market (Rosa and Grammatikos 2019). Drawbacks about it being the large required use of land, water use, and pesticides needed in the production of it. Pesticides contain large amounts of nitrogen, and it dries out the land (Saicheua, Cooper, and Knox 2011).

Recycled fibres are textile waste, it could be divided into pre-consumer waste and post-consumer waste. Pre-consumer being the waste, which is created before it meets the consumer, like fibre and yarn waste from production, leftover or damaged dyed yarn from production textile mills, or other parts like cutting leftovers. In this category one also finds unsold stock from retailers. While the post-consumer goods being the goods which have been thrown away after wearing for multiple reasons, like being worn out, damaged, or not modern any more to the owner (Modint 2015).

1.4.3 Fibres used by the companies

The thesis focuses on companies producing outdoor and workwear clothes, which uses different materials. For the outdoor clothes producers interviewed, the natural fibre wool was the major material used by three of our firms. One on the other hand, which among others produces jackets, trousers and microfleece jackets is using more synthetic materials. Among our workwear clothes producers', synthetic materials were used to a large extent, but also natural fibres such as cotton. This section will briefly describe these materials, its origin, and its supply chain.

1.4.4 The supply chain for clothes

Nowadays clothes come from all over the world, a realistic example could be a pair of hiking trousers, zippers are produced in one factory, reinforcement for the knees and bum in another, the rest of the material comes from yet another factory, and the factory where all the parts are fit together is somewhere else. This is also confirmed by Muthu (2014) who describes the textile and clothing industry as a particular complex, and extremely global and decentralized. Muthu has tried to illustrate the supply chain for clothes (Ref. Figure 3) but explains it as "difficult to map" (Muthu 2014, 2). This, because clothes could come from different production lines.

The supply chain for synthetic and natural fibres

As mentioned earlier, many of the companies interviewed used synthetic fibre in their products. Synthetic fibres are considered energy-intensive to produce. Common raw materials for producing polyester are purified terephthalic acid, dimethyl terephthalate, and mono ethylene glycol (Muthu 2014). Compared to natural fibre production, synthetic fibres do not require as much water to be produced. All the companies had natural fibre in their products, some had wool, some had cotton, and some had both in their products.

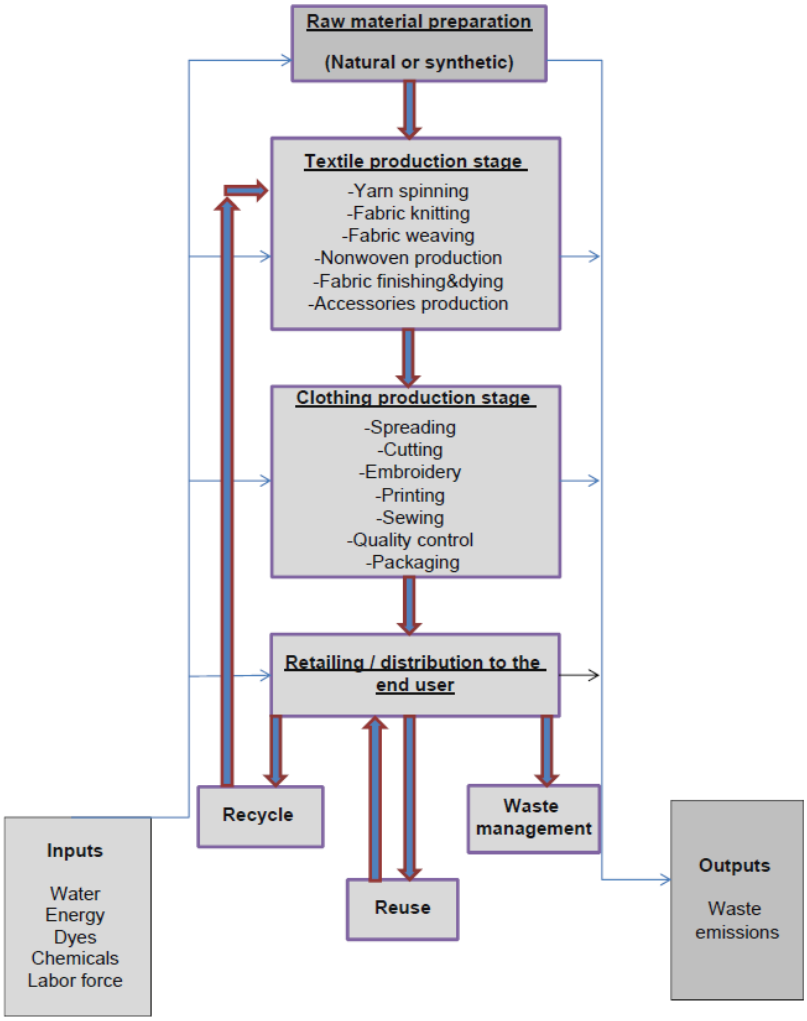

Figure 3: Textile and clothing production life cycle (Muthu 2015).

Conventional cotton ready for spinning involves these five steps: sowing cotton seeds, growth stage, harvesting, ginning, and baling. To perform these steps different inputs are needed, like water, soil, land, fertilizers, and pesticides. Non-organic cotton, the most sold cotton in the world, is extremely difficult to trace, this because it requires different batches to blend to be able to get the right yarn quality. Therefore, traditional cotton comes from all over the world. The only cotton which is possible to keep track of is the organic one. The organic cotton is not part of the chain of the traditional cotton but goes in its separate supply chain, this makes it possible to trace it back to the farm where it was grown at (WWF 2007).

In comparison to the synthetic fibre, wool fibres require much more time and input to be produced. It begins with cutting, which is done once per year, here the shearer distinguishes the fine wool from the damaged one. The second step is the sorting of the

wool, this is performed at a station where the wool is sorted based on quality, colour, and type. Further, the wool is being washed to remove dirt and other unwanted materials, but also to remove a substance called Lanolin. Lanolin is what is keeping the sheep from being soak-wet when it is raining heavily. When removing Lanolin, the producers prepare the wool to be washable in a washing machine at home.

Before the wool is sent to the spinning machines it goes through the process of carding, this means using a fine comb to get all the fibres in one direction. After carding the wool, it is being spanned, meaning it is twisted into a thread. In this procedure, the wool can also be combined with other materials to receive some other properties. Spanned wool is now sent to knitting, and depending on the techniques used, different abilities are added to the fabric. Last but not least the fabric is sent to a factory where the products being made (Ulvang 2020). Both when selecting producers and suppliers of raw materials and components, there are assessments as a part of the sourcing process. Problems related to sustainability can be complex to handle, and certifications often can be useful and are sometimes a necessity. Therefore, a brief presentation will follow in the next section.

1.5 Certifications

When ensuring sustainability in the supply chain, it has become common to use external parties, as they can provide the expertise that many companies do not possess themselves or can be expensive and time-consuming to develop internally. This can make it easier for companies in many cases, provide a structured approach for the industry and signal clearly to the customer that this product has more sustainable features than others. The following are what the authors identified as the three most used certifications by clothing brands in Norway. The certifications will be referred to later at the results and discussion sections.

The Nordic Swan (Svanemerket) is the official Nordic environmental certification standard mostly used by companies located in northern Europe. Working for sustainable use of water and other resources, protecting biodiversity, monitoring use of chemicals. They monitor the whole supply chain and have a lot of criteria that must be fulfilled to gain the Nordic Swan mark. The Nordic Swan also provides a service for private and official procurers, providing a network for decision-makers providing advice on how to practice a more environmental friendly procurement (Nordic Swan 2020).

Bluesign® is an international third-party certification standard, working against hazardous chemicals in the manufacturing process of textile products. Their goal is to provide a safer and more sustainable environment. To be approved by Bluesign® means that they have raw materials and components such as dyes and chemicals used in the manufacturing process of the whole value chain have been monitored by their criteria's and a comprehensive list of chemicals. Ensuring that the manufacturing process is as safe as possible to the environment and people (Bluesign®, 2020). Research by Scruggs (2013) found that using Bluesign® could be a good way for smaller companies to ensure that their products are safe, without having to invest in more manpower and knowledge. As well as force the sub-suppliers to improve their practices (Bluesign® 2020).

Oeko-tex® is another international third-party certification standard for textiles. Their objective is to provide companies and consumers with information and insurance that the whole value chain of the product is sustainable. One of their standards is SteP by Oeko-tex®, which includes monitoring working conditions, facilities, no harmful substances, safety, and resource management all by testing and certification processes. Environmental monitoring includes the aspects of responsible chemical use, water usage, pollution and emissions, as well a reduction of the carbon footprint (Oeko-tex® 2020).

2 Literature

This chapter describes what principles lay the foundation for our literature, here is also a proper literature review of sustainable procurement. The second part handles supplier strategy and presents the concepts lean, agile, and leagile. In the last chapter, a theoretical framework is presented, combining environmental sustainability and life cycle assessment.

2.1 Definitions

Traditional procurement was according to Johnsen, Howard, and Miemczyk (2014) defined after Baily and Farmer's definition from 1977. They describe it as the art of purchasing the optimal goods and services, where the source, quality, quantity, time, and price are all accounted for. Van Weele (2010) describes the procurement process as the strategic level of acquiring a product such as raw materials, supplies and equipment, from its supplier to its end destination. The process can be divided into four steps. Those steps are first sourcing, which itself involves planning needs, identification, and assessment, supplier selection. Then contracting, monitoring, and evaluation (Kalubanga 2012).

The UN Brundtland commission of 1986 defined one of the most common definitions of sustainability as follows: "Meeting the needs of the present without compromising the ability of future generations to meet their own needs" (Christopher 2016, 269). Other definitions of sustainability such as the one found in Gimenez, Sierra, and Rodon (2012), involve the social, environmental, and economic aspects, practising responsibility with the use of resources, people, and the environment.

The U.K. Department of Environment has reviewed definitions of sustainable procurement and concluded on its own definition. Describing SP as the process where organizations acquire goods, services and operations in a way that generates money and considers the whole life basis in terms of generating benefits to the organization. What extinguishes sustainable procurement from former practice is that it takes into account society, while minimizing damage to the environment (Force 2006).

Sustainable Public Procurement is a process by which public authorities seek to achieve the appropriate balance between the three pillars of sustainable development - economic,

social and environmental - when procuring goods, services or works at all stages of the project (European Commission 2019). Though directed towards the public sector, the definition can still apply for this thesis since SP is the process identifying the most beneficial economic value, while minimizing negative effects of its operations on society and the environment (Aktin and Gergin 2016). Thus, making this definition relevant for a study of the private sector within clothes production.

2.2 Sustainable Procurement

It is in many cases a complex challenge to include SP strategies into an established business model (Renukappa *et al.* 2016). Research has been conducted on sustainable procurement within different industries, where several have performed case studies and interviews, trying to achieve insight into how sustainable procurement practices can be implemented, what their benefits are and to identify factors that can hinder these changes. Walker and Philips (2006) found a need for increased training and senior management commitment, as well as including SP measures in the annual reports can make it clear for companies that procurement is expected to deliver on this agenda. However, the study found that there a lack of measurements on sustainable procurement impacts. Promoting awareness of environmentally, ethically and socially responsible procurement can help to encourage a consumer-led response in the supply markets (Walker and Philips 2006).

The authors found two other factors that can help companies implement more sustainable procurement. First a public promotion of environmentally, ethically, and social responsibility to encourage more involvement and awareness from the consumers. This sort of promotion could also help change how procurement managers in the industry are thinking, as well as changing their procuring pattern as a response to consumer demands. The other factor is to have SP measures included in the public annual report forms, to send a message that sustainable procurement is important and companies are expected to not only reflect on it but to perform measures and to provide results (Walker and Philips 2006).

Both production and consumption patterns are crucial to examine when working towards more sustainable development and reducing the environmental impact. It requires attention to the management of the whole supply chain to follow a product through its life cycle to

increase the use of that product, and decrease its environmental impact compared to alternative products and services (Renukappa *et al.* 2016). Some practices now require the use of environmental performance criteria at the supplier-selection stages, since many companies are found to be concerned with environmental issues at the product design, evaluation, and selection stage (Kalubanga 2012). Further, he states that to implement a functional sustainability strategy in the procurement process, sustainability criteria should be incorporated into the supplier selection specifications and company policy (Kalubanga 2012).

Renukappa *et al*. (2016) conveyed research on sustainable procurement in the UK construction sector, with a mix of semi-structured interviews and a survey. They found an increased focus on sustainability from the responded companies, with recognition of long-term profitability. Which led to increased efforts towards suppliers of materials and equipment, to ensure social and environmental responsibility. Still, many had the highest priority at cost, quality and time when considering suppliers. Also, worth mentioning is the lack of tools to implement SP into practice, suppliers not prioritizing sustainability, not being aware of any economic profits, and suppliers having a lack of leadership commitment. As well as customers not being willing to pay more for sustainable products (Renukappa *et al.* 2016).

The procurement function is crucial when incorporating sustainability, because they extend beyond the internal affairs of companies, reaching through their whole supply chains (Renukappa *et al.* 2016). With good relations to non-business actors, the distributing company could have a successful sustainable strategy (Crespin-mazet and Dontenwill 2012). Besides, Crespin-mazet and Dontenwill (2012) point to top management dedication as important. Decision-makers receive an increasing demand from customers and pressure from interest groups for social and environmental responsibility, while at the same time striving for short-term profit, pressured from investors (Renukappa *et al.* 2016).

Brands that are well known to their customers must often take responsibility for their suppliers' actions because they often draw attention from stakeholders (Walker, Di Sisto, and McBain 2008). Those authors also stated that small companies are under strong pressure from their suppliers. A parallel can be drawn in contrast to smaller projects. While the smaller projects make the largest part of expenditures in total, but these tend to

remain outside of attention because of their small size. The largest projects are often managed by centralized departments and were monitored by sustainability policies (Vluggen *et al.* 2019). This could make it even more difficult for small companies to withstand and manoeuvre pressure from the customers, with smaller resources and fewer guidelines.

Vluggen *et al*. (2019), has performed a case study on sustainable public procurement. They found several characteristics that can be applied for the private sector and clothing industry, with emphasis on workwear since that is of importance to public procurers as well. A collaboration between sectors is recommended to share information regarding sustainable procurement practices and strengthen knowledge (Renukappa *et al.* 2016).

The findings from Vluggen *et al*. (2019), showed a very low legal pressure to implement and maintain sustainable procurement. The National Legislation did not practice any formal penalties for non-compliance to guidelines. The same parallel can be drawn for Norway, as the standards are voluntary guidelines for private companies to follow (Standard Norge 2020). Further, it is emphasized that the strongest pressure to implement sustainable procurement comes from lobbying and political involvement from strongly committed private persons. Accountant and finance departments were reported to be more focused on their isolated departments being within budget and legitimacy, instead of viewing the enterprise and its effect on society as a whole (Vluggen *et al.* 2019).

Making decisions based on the whole-life cost of a product is an important part of sustainable procurement, besides, to consider the possible risks, successes, and implications for both the environment and society. If there is only focus on one organizational factor there is a higher risk that the change initiative will not work, and it is important to examine the relations between several key factors (Renukappa *et al.* 2016). Certifications have the potential to help companies share information and data across departments and environmental practices between competing companies operating within the same supply chains, unifying requirements towards the suppliers (Scruggs 2013).

To avoid damage to humans and the environment, as for example waters and ecosystems, chemical restrictions have had large importance to decrease and prevent spillage. The *ISO 1200* is one of these, and Scruggs (2013) mentioned that cooperation with suppliers

regarding environmental activities across large supply chains is important to ensure good communication and maintain control, but the certification itself is not always enough to ensure this. Reach is a certification that was mentioned as one of the new chemical management programs with the potential to organize industry practices by providing information and regulations toward human and environmental effects. With the goal of establishing a program that is more thorough than the *ISO 1200 standard*, having a broader influence through the supply chain.

From research by Scruggs (2013), interviewing 20 companies, they were told that the certifications added large extra costs. On the other hand, it provided a competitive advantage staying clear of regulations and legal problems. Building a positive relationship with stakeholders, avoiding negative publicity while minimizing the possibility of chemical-related problems. Now that we discussed sustainable procurement, another concept of reducing input factors and use of resources is lean and leagile. Which in this way are other related concepts, and will be discussed in the next section.

2.3 Leagile

A popular philosophy in the world is the lean process. To its core, it is about reducing waste and remove all processes not creating value to the end-customer. Mason-Jones *et al.* describe lean as "… developing a value stream to eliminate all waste, including time, and to enable a level schedule" (B. Naylor, Naim, and Berry 1999, 54). One of the tools in lean is the use of JIT (Just-In-Time). With JIT the company can minimize their storage use, have an improved flow of materials, and use staff more efficiently (Rewers and Trojanowska, n.d.). Thus, having JIT principles, more frequent shipments need to be considered for the purchasing department.

Two opposite poles within logistics are often said to be the push and pull principles. Push is often described as an anticipation of the future demand through the help of for instance an ERP system to forecast the coming demand. Instead, with a pull system, one responds, to the direct customer demand and thereafter produce what is required. Storage is kept to a minimum (Powell, Riezebos, and Strandhagen 2013). Therefore, one could say a push system requires a lot of storage space while a pull system not so much. Which again has a

direct impact on the level of consumption, and in this way the type of strategy is related to the use of resources and the level of environmental impact.

Lean is also about developing long term relations with collaborating partners, e.g. its suppliers, and have proven to be very important for industry practices. Toyota is said to be the founder of lean thinking, sends its engineers for work at their customers' site. By doing this they get a mutual exchange of information, in the end, both companies improve their working methods through this collaboration. Last but not least is the use of 'Kaizen', the word means, roughly 'life-long learning' or 'continuous improvement', meaning the people, processes, and standards is continuously improving, while the company is also learning (Keough 2012).

Agile on the other hand is a working method for improving the process of software development (Ambler and Holitza 2012). It began in the software and IT industry because these often run over budget. Agile could be described as moving a project to the next phase of the process, about balancing the constraints cost, scope, and time but at the same time being flexible for changes throughout the process (Koppensteiner, Sonja and Udo, 2009). The principles of agile are adopted by firms working with everything from pacemaker systems, banking, or electronics in a car so it is widely used (Ambler and Holitza 2012). Christopher (2016) describes the concept of agile supply chains, and here he emphasizes four things that need to be in place for a successful agile supply chain, virtual, process alignment, network-based, and market sensitive. Virtual meaning the supply chain is driven on information rather than inventory. Process alignment, indicating the full supply chain collaborate broadly. Christopher describes it as having a scope beyond the sole organization. Being network-based recognizes the organization to work towards the same goal and to follow the same mission (Christopher 2016).

Leagile was first introduced by Naylor, Naim, and Berry (1999), here they described the boundaries of treating lean and agile as isolated units, rather companies should strive to find its *decoupling point* and find out its *market knowledge* concerning the whole supply chain (B. Naylor, Naim, and Berry 1999). By decoupling point, Naylor *et al.* mean the critical path in the supply chain, were important operations take place, they give examples as the clothes producer Benetton, were there critical point being the dyeing process of the jumpers (B. Naylor, Naim, and Berry 1999). The decoupling point is what separates the

lean from the agile, therefore both systems could work in the same supply chain (Krishnamurthy and Yauch 2007). Often it is said lean works for competitive markets with good insights into the market demand, while agility for the volatile and competitive markets.

Galankashi and Helmi (2016) describe six characteristics for a successful sourcing strategy adopting leagile principles 1) when sourcing for suppliers the unpredictable demand needs to be taken into consideration, 2) managers have a responsibility to explore the features of demand and supply, 3) one must adopt a feasible solution of leagile, not treat lean and agile as two separate units, 4) the upstream activities should be cost-efficient, e.g. leaning towards lean, while the downstream activities should be giving the organization flexibility towards volatility, 5) the four pillars of leagile; strategic management, logistics management, collaboration management, and marketing management should be looked upon together with the suppliers, 6) finding the decoupling point is crucial for a successful leagile souring strategy. Important aspects of a successful leagile implementation is a full implementation, this does not only involve the sourcing strategy (Galankashi and Helmi 2016). Integrating the sourcing strategy with environmental sustainability, the chosen theoretical framework will be presented in the next section.

3 Theoretical framework

3.1 Environmental concerns when developing questions

At the early stages of this thesis, a search among relevant literature was performed to find inspiration to develop the interview guide. After some research, a framework for sustainable supplier selection criteria for businesses within the fashion clothing industry was identified and found applicable for this thesis. There was found inspiration from the research of Jia *et al.* (2015) regarding this topic. They have developed a framework consisting of twelve criteria that need to be considered when performing sustainable supplier selection. When they developed their framework, they put the criteria into three categories: economic, environmental, and social (Ref. Figure 4). The environmental part of their framework lay the foundation for the interview guide used, with some modifications. *Toxic chemical usage control* (C5), *Water consumption control* (C6), *Energy usage control* (C7), and *Pollution control* (C8) lay the foundation for our questions in our interview guide (Jia et al. 2015).

Criteria	Name	Definition
C1	Cost	Lowest product price without compromising the quality
C2	Quality	Ensure high quality control on the products
C3	On-time delivery	Level of delivery on-time as per the agreement with the customer
C4	Rejection rate control	Control on rejection rate of material
C5	Toxic chemical usage control	Control or avoid the usage of toxic chemicals in cultivation process and production process of textile.
C6	Water consumption control	Control the unwanted use of water in business operation.
C7	Energy usage control	Control the unwanted use of energy in business operation.
C8	Pollution control	Control the improper waste disposal, use of hazardous material in operation.
C9	Restriction on under age labor	Control the underage employment in business operation.
C10	Restriction on long working hours	Control the forcing of workers to work more than determined hours (apart from overtime)
C11	Human rights care	Basic facilities to labor, respect, *etc.*
C12	Safe guard mechanism for workers	Monitor the workers' health and safety

Figure 4: Criteria for evaluating and selecting sustainable suppliers (Jia *et al.* 2015).

3.1.1 Life Cycle Assessment

Utilizing a product's life cycle is an important aspect of the environmental part of sustainable procurement, also referred to as green procurement (Bratt *et al.* 2013). The ideas behind Life Cycle Assessment (LCA) are old and could be found in for instance Newtons research about how no energy is lost but simply transformed into some other form. The term LCA was first heard during a workshop held by Environmental Toxicology and Chemistry (SETAC) in the US in 1.990. At first, LCA was challenged and strongly doubted but eventually, it gained interest, both from academia and eventually the public (Horne, Grant, and Verghese 2009). There are many different definitions of LCA, Finnveden *et al*. (2009). define it as a 'tool to assess the environmental impacts and resources used throughout a product's life cycle, i.e., from raw material acquisition, via production and use phases, to waste management'.

Horne *et al.* (2009), on the other hand, describes it as "a technique for systematically identifying the resource flows and environmental impacts associated with the provision of products and services". As seen in the definitions, LCA is a technique or a tool for identifying the environmental impacts of a service or a producer throughout its lifespan. The International Organization for Standardization (ISO) have created four-steps, guiding the full implementation of LCA; "goal and scope definition, life cycle inventory, life cycle impact assessment, and life cycle interpretation" (Muthu 2015).

4 Research Methodology

This chapter will describe the methodological steps taken, from the characteristics of research methodology, research design, quantitative, qualitative, and mixed methods, case studies, interview as a research strategy, types of an interview, data collection and sample size, interview development, pilot test, validity and reliability, and case description.

4.1 Research methodology – characteristics

Robsons (2002) define different types of classifications for doing research, it could be:

- Exploratory – meaning finding out what is happening, gaining new insights, or generating new thoughts or hypotheses for research.
- Descriptive – describing an ongoing situation or phenomena.
- Explanatory – find an explanation for a situation or occurring problem, often by a causal relationship.
- Improving – having a goal of improving something specific based on the studied phenomenon

For this thesis, exploratory research will be performed, since our goal is to conduct what is happening, e.g. how big concern environmental sustainability has for the workwear and outdoor clothes industry in Norway with regards to the sourcing of suppliers.
One important aspect which distinguishes quantitative from qualitative research, is the lack of *inter-subjective verification,* meaning the possibility to produce a reproduction of the performed research. When not being able to reproduce the result, it is crucial to be able to understand the context and the processes taking place during the research. If not being able to reproduce it exactly, is the possibility to document the process is essential. This is done to be able to follow the documentation, step by step and to be able to assess the final result (Flick, von Kardoff, and Steinke 2004).

4.2 Research design

The methodology can be described as the theory of doing research. With a characteristic of three aspects, being collected systematically, being interpreted in a systematic process and to have a well thought and clear aim. Where the ultimate goal is to reveal why things are the way they are (Saunders *et al.* 2016). Before making a research design one must consider what unit of analysis to consider as it defines the research design. Using methodology theory makes it easier to interpret and follow a certain path. Therefore, methodology theory is of the essence. It can help to identify whether or not one is conducting research that will be able to make *analytical* or *statistical generalizations* from the findings of the research (Yin 2018).

Analytical generalization is when cases of similar characteristics can be used to support the findings (Runeson and Höst 2009). Thus, the purpose of this thesis is to contribute to the literature, by adding a case study with content deemed important from the existing literature. By doing more case studies on related concepts and towards this industry, researchers could add to the analytic generalization and provide a stronger foundation of procedures for the industry. In addition to providing a basis for conducting more case studies and research.

4.2.1 Quantitative, qualitative, and mixed methods

Roughly research is either defined as qualitative, quantitative or using something in between, called mixed methods. There are two types of research approaches, that for a long time was treated as two opposite poles, namely quantitative and qualitative methods. Today they are described as two methods with different ends on a continuum (Creswell 2018).

Quantitative research, as the name implies, relates to numbers, has definite and closed-ended questions, where qualitative research has descriptions with words (Creswell 2018). Saunders (2016), describes quantitative research as a method which maps correlations between variables. Until the mid-20th century, quantitative research was the accepted and dominated research model within social science, but from the mid-20th century, the qualitative research method is more accepted and gained interest among researches and disciplines. This also became the fact for the method called mixed-methods, as the name

refers to, has elements from both quantitative and qualitative research methods (Creswell 2018).

We have not identified studies on the Norwegian firm's choice to go for a sustainable supplier within the clothing industry. Especially on workwear and outdoor clothes have not been identified in the literature. One could say this research is built on the theory of qualitative research design. The aim is to mainly focus on a qualitative study to achieve a greater understanding of strategically sustainable procurement in context to environmental management and the procurement process. This can enable us to investigate social constructs and get more narrow information. Using interviews allows us to look at the why and how of the decisions that are made (Gibbs 2008).

Scott (2012), emphasized questionnaire and interviews to be common forms of methods for collecting data and interpreting the answers. This thesis applies both pre-coded questions, in the form of a small survey at the end of the interview and an interview consisting of open-ended questions. These two examples are ideas that Scott (2012) emphasizes. Which supports the choice of applying these two methods of collecting data, considering the limited timeframe for the thesis.

4.3 Case studies

There are different definitions of a case study, where researchers do not have any clear boundaries for how a case study should be defined and implemented (Yazan 2015). When choosing a case study approach for this thesis, inspiration from the work of Robert Yin has been taken. Case studies can be defined as "an empirical method that investigates a contemporary phenomenon in depth and within its real-world context, especially when the boundaries between phenomenon and context may not be clearly evident" (Yin 2018, 50).

We believe a case study is suitable because our research questions try to answer questions such as "how" and "why". There is no requirement for control of events, and the goal is to examine the phenomenon within its true context. With the ability to extract in-depth information that is contemporary and not necessarily applies to all cases in a similar context. Therefore, we have fulfilled Yin's criteria's for performing a case study. A case study can be divided into two designs, single or multiple case studies based on the unit of

analysis (Ref. Figure 5). They are further divided into four categories, (type 1) single-case design being holistic, (type 2) single-case being embedded, (type 3) multiple-case being holistic, and the last one (type 4) being a multiple-case witch is embedded (Yin 2018).

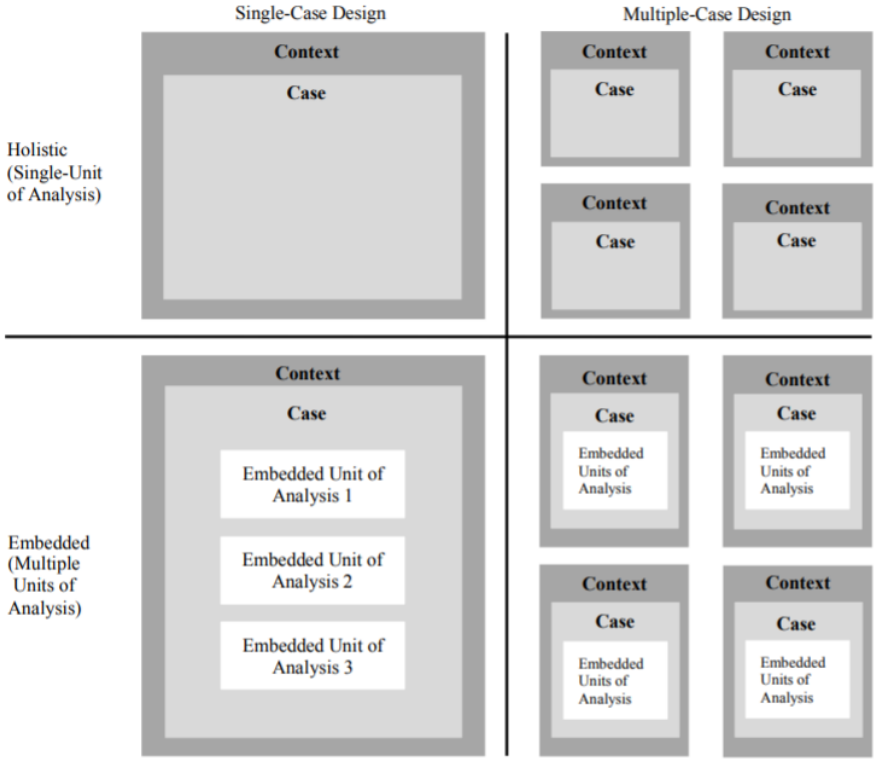

Figure 5: Single vs. Multiple-case study (Yin 2018).

We decided to perform a holistic multiple-case study, with each case representing one unit, rather than a sole single-case study, making it possible to compare multiple units. Yin argues a multiple-case study often being stronger and more robust than a single case study. For this situation, a multiple case study will allow to compare the companies and identify differences and similarities. Yin (2018) explains that if one has the choice and resources, it is always better to do a multiple case study, because the results are not based on just one case, but can provide supportive information and enable to make analytic conclusions based on the other cases as well.

4.4 Interview as a research strategy

A research interview is a conversation with a purpose between two or more people with an agenda to create a report, ask the right questions, and get the full attention of the interviewee. To its core, the conversations should be about "purposeful questions and carefully listening to the answers to be able to explore these further" (Saunders 2016).

4.4.1 Types of interviews

According to Saunders (2016), interviews could be either quite formal and structured following a detailed plan of standardized questions or they could be unstructured and informal where the conversations flow somewhat unprompted. Interviews can be categorized according to the level of formality and structure, structured interviews, semi-structured interviews, and unstructured or in-depth interviews (Saunders 2016). This categorizing of interviews is also similar to the work of Runeson and Höst (2009).

Semi-structured interviews

Semi-structured walks through a check-list of topics that need to be covered during the interview (Robson 2002). It is not the opposite of a survey interview, where the interviewer simply read out loud the same questions for all participating interviewee, but rather consists of less degree of standardization (Axinn and Pearce 2006).

As described by Robson a Semi-structured interview consists of a chosen topic that is supposed to be covered during the interview (Robson 2002). Semi- or unstructured interviews are considered too time-intensive for larger samples (Axinn and Pearce 2006). Therefore, interviews in the form of semi-structured format work well in our case, hence to the fact we only aimed at conducting between six to ten interviews. In the end, we performed a total of eight interviews. Something which clearly distinguishes a semi-structured interview from a structured interview is the flexibility for the researchers. When performing the semi-structured interviews they have the flexibility of changing the order of the questions and to a certain degree perform improvisation during the interview (Runeson and Höst 2009). Vital for us when performing this type of interview was the flexibility to ask extra questions, but at the same time having a structured and systematic form of gathering the data. Therefore, we chose to perform the interviews in the semi-structured form.

4.5 Data collection and sample size

Data could be divided into two categories, primary and secondary data. Primary data is the data collected directly by researchers for a given and specific 'problem at hand'. When applied, it is a part of the 'existing store of social knowledge'. In that way, it is available for other researchers to be used and is then called secondary data (Hox and Boeije 2005). In our work, we have used both primary data, collected through in-depth interviews but also secondary data, collected from the case-companies webpages. Besides, a survey, from Virke (Enterprise Federation of Norway) dealing with the attitudes of 600 Norwegian companies towards environmental sustainability.

The secondary data from Virke was not available to the public, but we have received permission to use it in our research. Hox and Boeije (2005) describe data from professional researchers or official statistical agencies as reliable sources of secondary data. Regardless of this, Virke as an organization strikes us as a reliable source of information. Also, with a sample size of 600, it strengthens our belief in this survey. The sample size of 600 is supported by the Encyclopaedia of Survey Research Methods: "…an area probability sample should have a minimum of 30 to 50… and a hundred or more are preferred for large studies" (Lavrakas 2008, 34).

While the previous numbers are in terms of area probability samples, it is different for case studies because it conveys the dynamics and specifics of one particular or several cases (Yin 2018). In total we conducted eight interviews (Ref. Table 1), these were conducted between the 26th of February 2020 and the 10th of March 2020 (Ref. Table 3). Data collection methods were through Skype, face-to-face and over the telephone. Incentives are a good way of increasing the response rate (Bonke and Fallesen 2010; Singer *et al.* 1999; Börsch-Supan, Krieger, and Schröder 2013), therefore, we told the possible interviewee we would support The Red Cross' work for the children in Syria for each participant (Ref. Appendix D).
These forms of interviews are supported by the research from Creswell (2018). The choice of not performing all the interviews face-to-face was justified by time and economical constraints.

As mentioned, we decided to gather data from both outdoor clothes and workwear producers. This was done as a purposive sample, to select units with certain characteristics. In total, four companies in each category were chosen (Ref. Table 1). It has been difficult to estimate the exact numbers of outdoor and workwear producers in Norway but from conversations with the Federation of Norwegian Industries (Norsk Industri), they have confirmed our numbers to be more or less the whole population of companies in our two categories. From our estimations, the population is in total 17 companies in the category outdoor clothes, here our sample represents roughly 25 per cent of the total population. Among clothes, in the category workwear, our sample represents approximately 30 per cent of the total population, with a population of 15 Norwegian brands.

Table 1: Sample and total population (own production).

Categories (Norwegian producers)	Sample	Total population	Sample in per cent of the total marked
Workwear clothes	4	15	30 %
Outdoor clothes	4	17	25 %
Summary	8	32	27 %

4.6 Interview development

For an analytical approach when utilising the semi-structured interview, inspiration has been taken from Flick, von Kardoff, and Steinke (2004), dividing the process into five essential stages. These being: Step 1: Material-oriented formation of analytical categories, Step 2: Assembly of the analytical categories into a guide for coding, Step 3: Coding of the material, Step 4: Quantifying surveys of material, and Step 5: Detailed case interpretations.

Step 1: Material-oriented formation of analytical categories

We decided early in the stage of the interview development that we both should be present during the interviews. This, to interpret the situation from a two-person perspective, include all the details and help each other to uphold the same circumstances during every interview and be as consistent as possible. We also wished to cover every topic; therefore, two persons were better than one. Also, we taped all the audio during the interviews

through a tape recorder application, storing the data on an encrypted and safe online cloud service. This step can be described as finding the core in each transcript. Meaning, how the content can be related to the given topic, and especially the research questions (Flick, von Kardoff, and Steinke 2004).

A test pilot can help refine the plans for data collection, improve content, procedures and provide conceptual clarification (Yin 2018). We performed a trial interview with a former procurement manager for a large international crane company. The procurement manager had industry practice and could provide us with advice from the perspective of a professional. Together we identified strengths and weaknesses of the interview guide, and what we could do differently. Especially, there was a focus on questions that could be difficult to understand or parts that could be misunderstood.

Step 2: Assembly of the analytical categories into a guide for coding

The interview guide was revised several times with our supervisor and with interview experts at the university college. Before the test interview we had begun to structure different questions into categories, we also expected new ideas would appear. Then, changes were made after the test interview and updated to the interview guide and the categories of codes. This is also supported by Flick, von Kardoff and Steinke (2004), who states that the prosses for a semi-structured interview can be difficult to prepare ahead of. This is no exception for our case, and we did as much cataloguing of topics as we could, but naturally revised the categories throughout our work.

Step 3: Coding of the material

All materials from the interviews were divided into different categories based on the structure of the interview guide. Each of these categories also had several sub-categories. The chosen method was conceptual coding since all interviews followed the same frame. It is vital to perform all interviews according to the same coding guide. Each label for the coding is important, and it is preferred to avoid any overlap in the labelling. One should rather try and identify the dominant label, and chose this one (Flick, von Kardoff, and Steinke 2004).

Step 4: Quantifying surveys of material

The fourth stage is about summarising all the results, before the final step. At this stage, one should be able to present a table, roughly summarizing the results from the coding. It is also vital to get an overview of all the cases to extract the externalities and inconsistencies in the results. It is beneficial to present the results in a table to help the reader grasp the information easier (Flick, von Kardoff, and Steinke 2004). The applied approach has been to summarize the results to identify similarities and differences, while at the same time not changing the data too much to gain a deeper understanding of the business practices. We used some tables and graphs to make it easier for us and the reader, sometimes to aggregate our results.

Step 5: Detailed case interpretations

In the final step of the analytical categories for semi-structured interviews, the coding should be able to reject or accept a tested hypothesis, or "to distinguish between conceptual terms, to arrive at new theoretical considerations or to revise existing theoretical frameworks" (Flick, von Kardoff, and Steinke 2004, 257). What specific approach that is taken, depends on the design chosen by the researcher, and their field of expertise (Flick, von Kardoff, and Steinke 2004). Our chosen approach from a logistic perspective is to examine the information from each case into separate categories following a coding scheme. This enables us to identify differences and similarities between the cases. Afterwards, the information can be aggregated and provide a new meaning giving the insight to address the research question.

4.7 Validity and reliability

Creating research that is trustworthy and reliable is, of course, a top priority for any researcher. On the qualitative criterion, there are several aspects to take into account when creating trustworthy research within the field of logistics "'transferability and contextualism' and 'trackability and explicity'" (Halldórsson and Aastrup 2003, 331). The chosen approach for ensuring validity and reliability through this thesis, primarily follow the Yin design. Its framework consists of four individual tests which are a developed version of these four (Ref. figure 6): 1) Construct validity, 2) Internal validity, 3) External validity, and 4) Reliability. For an exploratory research it is not common to do tests of

internal validity, and therefore the thesis will further focus on construct validity, external validity and reliability (Yin 2018).

Tests	Case Study Tactic
Construct validity	• use multiple sources of evidence • have key informants review draft case study report
Internal validity	• do pattern matching • do explanation building • address rival explanations • use logic models
External validity	• use theory in single-case studies • use replication logic in multiple-case studies
Reliability	• use case study protocol • develop case study database • maintain a chain of evidence

Figure 6: Case-study tactics for four design tests (Yin 2018).

4.7.1 Construct validity

Ensuring construct validity is about identifying the correct operational measures for the concepts being studied. Three steps need to be taken into account under this theme, multiple sources of evidence, a chain of evidence, and lastly to have the draft report reviewed by the informants (Yin 2018). As mentioned earlier, we have gathered one type of primary data, from our interviews. Secondary data was gathered from three sources, the code of conduct of the companies, literature review, and from a survey ordered by Virke (Ref. Table 2) (Enterprise Federation of Norway).

Table 2: Types of data gathered (own production).

Gathered information			
Data from	Type of source	Sample size	Source
Interviews	Primary	8	Conducted through person-person meetings, telephone, and Skype
Code of conduct	Secondary	¾	Webpages of participating companies
Literature review	Secondary	6/10	Conducted from own literature review
Report on 'Norwegian firms attitudes towards sustainability.'	Secondary	600	A report ordered by Virke

A chain of evidence was also something that was strived to establish, as recommended by Yin (2018). Saving all interview transcripts, all the translations, as well as record of who said what when writing and coding, for the authors to be able to trace the information to its source. This way strengthening reliability. Lastly, all the interviewees were informed that the interviews would be audio recorded by the authors, to be able to write an accurate and complete transcript of what was said. This transcript was then sent to all the informants to review and confirm and for the interviewee to make changes if edits were needed.

4.8 External validity

Yin sum up a description of external validity as “The extent to which the findings from a case study can be analytically generalized to other situations that were not part of the original study” (Yin 2018, 351). It will further be discussed to what degree the findings from this exploratory case study can be relevant for other case studies, as mentioned by Runeson and Höst (2009).

Case studies often follow the approach of an analytical generalization. Where the results are compared with other cases of similar characteristics, to address the ability of generalization (Runeson and Höst 2009). It is important to connect the theory to the existing literature to compare with the findings. Such a comparison can help address and explain gaps or weaknesses in the literature. This way it increases the generalizability by adding additional knowledge. The use of replication logic by conduction more case studies, could this way try to replicate the findings and make the result stronger (Yin 2013). For our case we had a multiple case study, strengthening the generalization further by allowing us to compare the results.

Yin describes one vital aspect of the strength of research to be “rival explanations for your findings” (Yin 2018, 68). He further argues the more “rival explanations” the more valid and accurate will the research be. Only with both your results and someone else’s results will one be able to make ideas about future research and therefore fulfil the work with fully accepted research. We have used both the survey from Virke, comprising 600 participants and of course, relevant, and topical research to strengthen our results. Worth mentioning is the work by Renukappa *et al.* (2016), Vluggen *et al.* (2019), and also Crespin-mazet and Dontenwill (2012).

The external validity can be questioned if the researcher generalizes the results for other groups with different characteristics. Extending the groups in the experiment, to settings not being examined or other situations (Creswell 2018). A case study with larger numbers would increase the generalizability based on a larger target sample. But on the other hand, this would give less in-depth and contextual insight, which is the originally intended strength of the case study (Yin 2013).

From the data collection and sample size, the population of the sample studied was defined, thus enhancing its generalizability. Since this is a case study, there are a small number of cases compared to a more statistical approach. Still, it was tried to do as many interviews as possible with the limited time and resources at the authors' disposal. This to gain as much information as possible and be able to say something about the industry. The outdoor and workwear industry is small in Norway, and this makes it easier to gain knowledge from this study, that can be applied to other similar companies within the target population.

4.9 Reliability

Through testing the reliability, we want to make sure that another researcher reaches the same type of results by following the same procedures as we did when collecting the data. "The goal of reliability is to minimize the errors and biases in a study" (Yin 2018, 93). Further, Yin (2018) emphasizes that the most important part demonstrating reliability is to document the procedures followed in the case study.

There are two tactics:

- Case study protocol
- Case study database

To maintain a chain of evidence, a structured approach was followed when gathering the data. Reviewing the interview guide with the supervisor, and with two other professors at the school. Also, it was conducted a test pilot of the interview guide with an experienced professional, before moving forward with the data collection. Ensuring as much as possible, that the right premises were set. When conducting the interviews, we were always two people, supporting each other and reviewing the information. The time range of interviews was always between 30 and 60 minutes. Transcripts of all interviews were made, and reviewed together checking for mistakes, as recommended by (Creswell, 2018). Through the whole process, we had regular meetings together, sharing the information and reviewing the analysis together. According to Creswell (2018), this strengthens the reliability of the results.

4.10 Case description

This chapter presents our cases and, we will describe the participating companies and their production concept. The case companies have been assigned fictional names to maintain some degree of anonymity.

Table 3: Conducted interviews (own production).

Case	Industry	Respondent	Date	Duration
Activity	Outdoor	Product manager	26.02.2020	35 minutes
Wool1	Outdoor	Purchaser/logistics	03.03.2020	40 minutes
Wool2	Outdoor	Brand director	06.03.2020	30 minutes
Wool3	Outdoor	Company manager	06.03.2020	60 minutes
Light1	Workwear	Company manager	04.03.2020	35 minutes
Light2	Workwear	Procurement and Marketing (2)	09.03.2020	40 minutes
Heavy1	Workwear	Purchaser/demand planner	05.03.2020	30 minutes
Heavy2	Workwear	Logistics and Design (2)	10.03.2020	60 minutes

1st company: Activity

Activity is one of the largest outdoor brands in Norway. They have a focus on delivering high-quality wind and waterproof jackets and pants, as well as fleece jackets, gloves, wool and other outdoor clothes. Target customers are both businesses and private consumers. We interviewed the product manager of the brand. They are organized by two designers under the product manager, and two coordinators, that is working after the designers are done with the design. They also have one office in China with six employees. The product specifications are then sent to them, where they arrange the production. The procurement department in Norway is taking sales orders, where the procurement and product manager are handling additional orders before it is sent to China.

The production is based in China. They do not own any factories, but they own an office in China. They are working with eleven different factories because they are specialized in different types of fabric. They usually use large garment factories from a certain area in China. The exact origin of the materials used is not always known, sometimes they buy it through specialized companies. They have long time relations with a lot of the factories, and other times they source from new ones to be competitive and to have a backup.

2nd company: Wool1

Wool1 is a medium-sized company that produces clothes from wool with long traditions in Norway. They are internationally recognized with a market focus on Norway, western Europe, and North America. They have a focus on quality and environmental friendliness, with fabric from 100 per cent wool. We interviewed an employee in charge of planning and purchasing all raw materials. There is one CEO with five functions underneath, Supply chain Director, Design Manager, Marketing Director, Sales Director, and Financial Director.

The production is mainly based in Norway, some parts of the assembly occur in Poland. They own most of the factories and organizes everything themselves, except for some very rare occasions where they do not have the right equipment. Around half of the wool used comes from Norway. A small line of their product segment is produced solely by 100 per cent pure Norwegian wool. All materials come from 20 different European suppliers. Some suppliers are very large and make up for large parts of the quanta, those can be considered main business partners. Most of the supplies provide yarn, but also zippers, buttons, logos, and piece goods.

3rd company: Wool2

Wool2 is a brand that is part of a brand house, consisting of several companies. Our interview was with a manager of this brand, this person was also in charge of many activities involving the other brands. *Wool2* is a large company in the sports market in Norway, where a large part of their sales come from exports. It is a company that mainly produces clothes with wool as raw material. CSR is of high priority for the company, as well as having a responsible value chain. To ensure that the customer knows they buy a product with no social or environmental issues connected to it, they use a comprehensive

code of conduct. We will elaborate more on the code of conduct, procedures, and practices from the interview in the result section.

There is a brand department and a product department, our interview was focused on the product department. The product department's main function is product development, with responsibility for the clothing line and production, to ensure it is produced on the specific factories. There is one centralized supply chain apartment that works across all the brands. Main purchases are done twice per year, it is divided into summer and winter season.

The location of production is in several places in the world. "We still have a lot of production in China, but we also have a lot in Europe." All socks are produced in Europe, 95 per cent from Spain, mid-layer from China, with wool from special areas in Australia. There are other places in between, but the origin of the wool is always known. The brand is using 11 factories, but they do not produce themselves and have no ownership of the factories. This is mentioned as a strategic decision on their part, to be more flexible to fluctuating trends and prices.

4th company: Wool3

Wool3 is a Norwegian company that creates and sell clothes from their brand, with 100 per cent wool for leisure and outdoor activities concentrated towards the Norwegian market. They typically make sweaters, trousers, woollen hats, socks, thermal underwear, blankets, etc. They have a large production and uses around 25 tons of wool yearly. We spoke with the manager of the company. There is a group structure with one main company and four subsidiaries that are concept stores, which only sells one brand. They have no contracts with commercial stores and oversee the whole sales process themselves. At the time or our interview, the company is doing some organizational changes. Where they are going to hire a new CEO and a CFO with logistics and procurement background. The company is in control of the whole value chain itself.

The production is currently being moved from China to Europe, and they have visited several production sites. They do not have ownership over factories. They have contracts with one yarn factory and one knitting factory. The yarn factory buys wool tops and turns it into yarn from the spinning machines. The factories buy wool tops, but the company knows which type of wool they want, and how coarse it should be.

5th company: Light1

Light1 is a sole proprietorship that the owner bought some ten years ago. They provide work attire to some official and private companies in Norway, business to business. Mostly it is t-shirts, piquet, pants and overalls, all made of solid quality designed for manual labour. They have three large customers. One of them is a major brand with stores all over Norway targeted towards agricultural and gardening services, where our respondent provides overalls and have two main deliveries. The other one is a large store that sells work clothes directed towards the transport sector. And the third is an employment agency in the agricultural business. All clothes are custom made, designed especially for the target customer with their logo on the product.

Light1 has a business partner in Poland where they have a factory with five employees that *Light1* owns 50 per cent of. *Light1* handles all relations with the customer and agrees upon the design with them. All administrative work is done by the *Light1*, including accounting and purchase of transport services. Most of the administrative work is digitalized. They have a factory in Poland, and this is where most of the production happens. They also buy some different shirts, mainly from two wholesalers where the logo is customized, and the product is redistributed to the customer in Norway. This whole process happens in Norway. The materials used in production comes from a large English company with factories in Portugal, England and Asia. The procurement of materials and all other operations related to the production in Poland is handled by the staff there.

6th company: Light2

Light2 is a small Norwegian company established around 30 years ago. They are a wholesaler providing shirts, t-shirts, jackets, piques, and other upper body clothing, as well as backpacks. Primarily business to business. The company is known for providing solid t-shirts that can withstand for a long time with regular use in several industries. We interviewed two people, one in charge of marketing and the other in charge of procurement. They are a small, family-owned organization with 13 employees. Most of the staff consists of salespeople, storage, and back office. Their flat structure leads to two-way communication and the staff are working with several processes outside their formal position.

Production is in China, Bangladesh, and some in India. They have approximately nine suppliers, seven in China, one in Bangladesh and one in India. Most of the suppliers they have had for over 25 years, with very good relations, based on experience and trust. The origin of the materials depends on the product, usually, they buy cotton on the spot market in China. They do not own any factories.

7th company: Heavy1

This is the workwear section of a large Norwegian company with international recognition. The company generally produces outdoor clothes, rainwear, and sportswear among others, as well as a large section of workwear, which we are going to focus on for our study. They provide work clothes for several manual labour professions, such as construction workers, carpenters, and other contractors. We interviewed the one responsible for procurement in this section of the brand. There are three different brands within their segments and separate procurement functions. We are focusing on the workwear department. The company operates worldwide with offices in numerous countries. There are sourcing offices in Turkey and Hong Kong, communicating with suppliers locally with distribution centres in Holland and Seattle.

Most of the material used in production comes from various places in China. *Heavy1* do not own any factories but are doing business with 25 factories where five or six provides 70 per cent of the production. Some factories are allocating orders, mostly they know where the production is located and are working with the same partners. Most of what they buy from suppliers also come from China. *Heavy1* book production, select materials themselves and have full control of the process.

8th company: Heavy2

Heavy2 is a Norwegian company with several brands, all mostly directed towards outdoor wear. We interviewed one specialist within procurement and one within product development, working with two brands providing workwear mostly towards the privatized professional market in Norway. One of them makes professional rain clothes and the other one professional workwear, both with a high focus on quality and safety. The products are usually sold through different store chains selling workwear. The company is organized with a CEO and one brand manager for each brand. All brands have a common warehouse

and economy department. Each brand has its design and product development department, as well as logistics and procurement functions.

Production is localized in both Europe and Asia, from different countries. They do not have any ownership of any factories; everything is rental production. There used to be produced in Norway, but it was outsourced several years ago. Most of the rainwear is produced in Europe, while most of the workwear is produced in Asia. They are buying directly from the suppliers, and then it is produced at the factory. The materials include piece goods, buttons, and zippers, etc. Of these products, they have three suppliers in Europe and five in Asia.

5 Results and Analysis

5.1 Supplier selection

Criteria's

The most frequently mentioned criteria among the interviewees is quality (Ref. Figure 7). When providing high-quality clothes, the right attributes and durability are important. Many of our interviewees have safety regulations and industry standards they must follow. While others press that continuous quality is of critical importance, to ensure predictability and customer satisfaction.

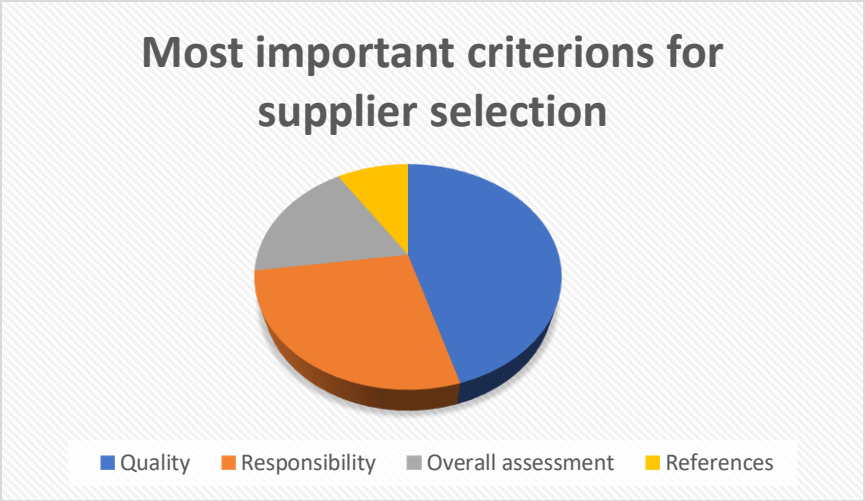

Figure 7: Most important criteria for supplier selection (own production)[1].

Almost every respondent told us that all their criteria were important, and it was difficult to rank them. It is the total package of cooperation, deliverability, competence, communication, quality, and tests being in order. Criterions which distinguished workwear producers from the outdoor producers were the emphasis on quality and delivery precision.

[1] Quality: The received quality of a good, vs. the expected when ordered.

Responsibility: The responsibility of environmental conditions of the up- and downstream activities.

Overall assessment: The responsibility of environmental conditions of the up- and downstream activities.

References: Reputation and recommendations to the specific supplier.

Here workwear had a much more focus on it when sourcing for new suppliers. In quality, the EHS (Environment, Health and Safety) seem to be what was the most important aspects concerning quality. This due to the strong regulations on EHS-clothes in Norway. The emphasis on the delivery precision as a quality criterion for the workwear producers could be described because most of their customers were from corporate businesses. Corporate customers tend to order larger quantities relative to private consumers, and therefore sets higher demands.

As well as good working conditions and facilities that accommodate modern standards, the price is often not at the top priority. Because there are so many other things to consider today. *Heavy2* does a credit rating because they want to do business with a solid company, for the reason of more predictability and less risk. *Wool2*, *Heavy1*, and *Activity* have standard criteria listed in their code of conduct, where social responsibility is of high priority, as well as environmental concerns.

"We have quite high standards. This is getting more and more important, the end-user is more concerned about things being in order, but all this affects the price. If we had not been as strict, then we could probably have found cheaper factories, but we are not willing to take that risk.", says *Wool2*. Social concerns and working conditions are mentioned in all the interviews. *Heavy1* includes these in their Corporate Social Responsibility (CSR) going beyond the local laws. *Heavy1* describes CSR as their way to contribute to social and environmental questions more than what is currently regulated by local laws. Focusing on issues safety at the factory, salaries, and insurances, etc.

5.2 Sustainability

Criteria

There is a general interest in sustainability and environmental issues as a part of the companies' strategy. The interpretation of sustainability can be found in the table below (Ref. Table 4). When procuring materials and sourcing factories, this is connected to the certifications. Not all brands are certified themselves, but their suppliers are. They then want to make sure that there has not been used any toxic or illegal chemicals or any spillage when for instance dyeing yarn or fabrics. Therefore, many companies want to ensure that they have certain environmental certifications in terms of their production process.

Sustainability is a part of the standard criteria for selecting suppliers. The following are some examples given by the respondents. *Activity* has a continual interested in how the sustainable strategy of the supplier is, but no clear criteria other than the certifications, which is a consistent case all the interviewed companies. *Light1* buys shirts from two main companies that are both prioritizing sustainability very high and are very good at it according to the respondent. *Light2* rank sustainability and the environment, as their second-highest priority, after quality. Since *Heavy2* provide workwear, it is imperative to follow the industry standards and safety regulations, governed by ISO standards and tests. "We are very fixed on the safety certifications; therefore, we cannot always prioritize environmental concerns first. Where we can prioritize it, we do, as with recycled plastic and paper." Says, *Heavy2*.

Animal welfare is also of high importance to all the interviewees that use wool. It is a demand that suppliers can document that the wool delivered is within a certain framework. Consequently, many of them prefer wool from Europe and avoids wool from certain places in China and Australia because of practices concerning animal welfare.

Companies interpretation of sustainability[2]	
Wool1	Elaborates that wool is a renewable resource and the sweater is naturally dissolvable.
Wool2	Emphasizes that wool is a more sustainable and renewable material. Important to stop the over-consumption. By buying wool, the garment can be used for more activities over several seasons compared to cotton.
Wool3	Mentions their sustainability strategy, and certifications where they are inspected on animal welfare, working conditions, fair wages, and being cautious about the environment.
Activity	Sustainability is defined as a running business in the most environmentally friendly way.
Light1	No specific definition. Are aware of the situation and that future changes will come.
Light2	Has seen an increase in the focus of the environmental part of sustainability. Their priority is that all products are approved and contains no hazardous chemicals.
Heavy1	They link sustainability to the materials used, and the promotion of ethical values, human rights, labour rights, and the environment.
Heavy2	Their strategy is to make clothes with very good quality and then reducing the consumption of products by using materials and components of good quality that lasts.

Table 4: Sustainability definitions (own production).

[2] All participants emphasized that sustainability is a huge field, and it was difficult to define it accurately during the interview.

5.2.1 Sustainability initiatives

For *Activity*, their production sites had earlier little focus on environmental aspects but are now focusing fully on it throughout the production. *Activity* describes their journey this way: “We do not try to tell that we are the best at this, but what we say is that every time we make an effort it is in the right direction. We are very concerned about that, that we are moving in the right direction.”, says *Activity*.

Heavy1, on the other hand, have their unit working exclusively on sustainability-related issues. From the webpage of *Heavy1*, one could find they are including their suppliers in this work and are following the highest standards in terms of social and environmental values. *Heavy2* does not have the same strategy as the others but has a wish to contribute to areas where they have possibilities to do so. They are closely paying attention to trends and recommendations for the future.

None of the companies we interviewed said anything about where the energy they used came from, only *Wool1* mentioned the use of hydropower as an energy source in their factories. *Light2* tries to use the mode of transport with the smallest impact on the environment, especially concerning CO_2 emissions. *Light2* currently uses ships for most of their transports. The same is the case for *Heavy2*. The use of recycled materials was popular for packaging materials. Here *Light2* and *Heavy1* are focusing on this. *Heavy2* instead had chosen to use recycled paper on their labels for their products.

5.2.2 Expectations from customers

The general trend is that they experience that customer expectations for sustainability and environmental actions have been increasing rapidly in the last two years. The majority mention that they can see it, especially with the younger generation. It is an increasingly stronger focus and people are getting more aware. It used to be price and service that was the most important, but now thee companies must make other priorities as well.

Wool2 experience customer expectations mostly regarding the certifications and good control of the emissions, etc. “It is getting more and more important. We are lucky to only work with wool, that is a quite sustainable fibre, compared to a lot of synthetic fibres, and cotton, that seizes enormous amounts of agricultural areas.” *Wool1*. Wool can be regarded

as a renewable resource, which is an advantage to those companies, where their largest concern from customers and a high priority of all interviewees, is the animal welfare.

Heavy2 puts high pressure on its suppliers to have environmentally friendly fabric and products. Because the respondent receives pressures from the end customer, which makes this a priority for them and forwarding the pressure to the suppliers and factories. Regarding workwear, some of the largest business customers have criteria about sustainability in the contracts. In bidding rounds, the criteria of environmental concerns are highly prioritized. *Light2* experiences that the customers are very concerned about environmental issues and sustainability, but in the end, those products are more expensive, and many customers end up buying the cheapest products. *Light2* also experience that their customers are very interested in the tests that Intertek (Ref. Table 5) does, which will be described more in the next section regarding the certifications.

5.3 Certifications

A lot of the suppliers' *Activity* uses must follow the standards from The Swan ecolabel (Ref. Table 5). They also have their general requirements. It takes a long time to get certified with The Swan ecolabel. The factory must answer numerous questions in writing with documentation. Later it is validated and monitored regularly. Several of their products are Swan labelled, and they are in close development of launching more products of the swan label, with a diverse variety of fabrics, but the process takes time and effort.

Table 5: Certifications used or in the process of implementation by the outdoor category (own production).

Outdoor			
Activity	**Wool1**	**Wool2**	**Wool3**
Considering Bluesign® Working with The Swan ecolabel	Bluesign® on the wool Considering Nativa Oeko-tex®	Certifications are preferred No specific demands	Considering Bluesign® In a process of finding new Oeko-tex®
Workwear			
Light 1	**Light2**	**Heavy1**	**Heavy2**
ISO 13668 Test institute	Intertek (chemicals)	ISO certificate Bluesign®	ISO certificate Bluesign® Reach SteP by Oeko-Tex®

Activity is also currently considering Bluesign®. If they do, they can mark the brand as Bluesign, and Bluesign® can also help provide them with factories that are certified by Bluesign. This makes the process easier for the interviewees when they know that the factory is already certified. They explain that Bluesign® is different from The Swan ecolabel by focusing more on chemicals and are counselling the production by providing lists, information, and showing them the best alternatives. Bluesign® is also more internationally recognized, while The Swan ecolabel is more known in Scandinavia and in Europe. *Wool1* and *Wool2* use factories with a certification providing security that no hazardous chemicals are used, securing animal welfare, and minimizing water consumption. *Wool3* are in the process of finding the right certifications and solution that fits their goal. They are not willing to pay for only a brand name of a certificate if they can do it better on their own.

Light1 does not have any specific certificate branding on the clothes, but they follow the ISO standards *ISO 13688*. There is a thorough test process of the material and the whole product at an institute. They use the same material for the other products, and then they do not feel the need for any additional certifications. *Light2* uses a program from Intertek. They have a list of chemical restrictions ensuring that the products do not contain the hazardous chemical. That is of a very high priority and a part of *Light2'*s environmental strategy. There are performed random tests by Intertek at the factories and suppliers to control the use of chemicals.

Heavy2 have ISO standards they must pass to follow the industry standards and safety policies. Besides, they have the SteP by Oeko-tex certification, avoiding the use of hazardous chemicals. And, REACH, the European chemical policies that are used in some cases instead of Oeko-Tex®. The requirements for Oeko-tex® are reported to be stricter. There are required ISO standards regarding the company they do business with as well as *ISO 1401* for the environmental concerns, and *ISO 9001* on Quality. If the supplier is ISO-certified, it provides them assurances on quality and responsibility.

5.4 Monitoring suppliers

All interviewees always try to have a physical inspection and field trips, before the factory is approved, as well as regular visits if they are in business together. Most of them visit themselves, while *Activity*, *Wool2*, and *Heavy1* have local offices that are aiding this process in the form of certifications and following up on the procedures (Ref. Table 6). All have a long history for 10 years or more with the largest factories, with good relations based on trust. It is much about making sure that the suppliers are certified.

Quality Control	
Outdoor	Performs controls and audits internally, as well as certification control and external laboratories. Activity performs quality control from local offices.
Workwear	Quality control is done internally and externally if additional certifications are used. All interviewees use external tests to uphold safety regulations and chemical restrictions. The safety regulations are of importance for workwear companies. *Heavy1* has local offices doing quality controls as well, and Light2 has external quality controls at the newest factories.

Table 6: Aggregated definitions of quality control by participating companies (own production).

5.5 Monitoring Sub-suppliers

Wool1 claims they have a quite good overview because they have few suppliers and have been working with them for a long time. Which gives them insight as to whom the suppliers are working with. Especially on wool, it is critical to know the whole cycle from the start. *Wool2* has a mapping of the suppliers, where all suppliers must fill in suppliers, all sub-suppliers, and what certification they have. *Wool3* does not have a full view of sub-suppliers of wool today but are working on it as a part of their restructuring process. *Activity* has a lot of sub-suppliers on some products. Bluesign® has requirements for the sub-suppliers and can help the company to monitor by providing a standardized specification of requirements. This makes the process more effective. It is the office in China that oversees that process.

Light1 buys through large companies, and those are monitoring the sub-suppliers. Most of the *Light2*s materials are produced at the factory. This means that they have a full overview of the manufacturing process. They buy the cotton but have no other sub-suppliers. On the few products they buy, they can provide a list of certificates and uses

external quality controls regarding those sub-suppliers. Since *Heavy1* and *Heavy 2* book and select all the material, they have control of most of the value chain. Local zippers and labels can also be used. From 85 to 90 per cent of *Heavy1*s cases, they know the exact origin and transportation. Both interviewees can tell us that they use large and acknowledged suppliers who follow local rules, regulations, and social responsibility.

5.6 Supplier Strategy

All companies had a different way of handling their suppliers. Half of the companies from outdoor wear had a short lead time, this was due to their strategy of having production close to them, and therefore give them a quick response to the market. From the producers of outdoor clothes, half of them operated with short lead-times. This was primarily due to close production facilities. The advantages of this were more control of the origin and the producers but also to be able to quickly respond to market demand.

Among the producers of workwear clothes, two out of four operated with short lead times and those companies also ordered small batches. *Heavy1*, the one company ordering big batches and had a long lead time was the largest company among all those four. One company, *Heavy2* had a mixed strategy and operated with both short and long lead-times (Ref. figure 8). *Heavy2* primarily ordered small batches from Europe and bigger from Asia. These three companies, mentioned above, ordering small batches did not have different collections for the seasons. This could be one of the explanations for them not going for bigger procurement a few times per year. Related to supplier strategy this indicates that the workwear focuses more on agile and/or leagile strategies, while the companies focusing on season sales would stick to JIT-principles and go for a more lean-approach.

Figure 8: The production process for Heavy2 (own production).

5.6.1 Life Cycle Assessment

All interviewees stress that they strive to make products of long-lasting quality that leads to less consumption and a longer life cycle for the clothes. *Activity* told that they are responsible for the whole process from development, production, and procurement. They emphasized this through there implementation of The Swan ecolabel and Bluesign® certifications. The Swan ecolabel makes the companies reflect upon the lifecycle of the product to achieve the mark.

The companies using wool are cautious to use 100 per cent wool and emphasize to only use 100 per cent natural fibres if they are mixing some materials. They also take responsibility when it comes to animal welfare, and with the whole process backwards in the value chain toward the start of the product. This is important for the producers using wool as their primary source of input, and something we have heard from all three companies producing wool clothing.

The clothes from *Light1* have high quality, and they have experienced that they last longer than anticipated. “If I am being totally honest with you, I think it is very good. Our strategy has been to deliver good products, and I think it is good that the products last long. It is also personal, because I have a grandchild, and think a lot about how they are going to live in the future.” *Light1* says.

*Heavy1’*s focus is backward in the supply chain with a concentration on the first and second-tier, depending on the raw material. Regarding down fill, they take responsibility straight back to the initial source. They have a focus on efficient use of water, chemicals, and energy, and to stop using PVC and other materials that can pose a threat to the environment. They also mention that they are doing research and development on closed-loop systems. *Heavy2* uses Oeko-tex® certified materials.

Recycling

Six of the corresponding companies have acted to uses some sort of recycled materials, either in certain products or as a test project. *Activity* use a layer on the products called PrimaLoft®. This layer uses recycling and takes environmental issues into account more

than other layers. The use of recycled down fill is also mentioned. *Heavy1* has a priority to use as much recycled material as possible, an example is their Polar fleece-sweaters. *Heavy2* is currently in the process of using recycled plastic as protection for the rainwear. *Wool1* is currently working on a system to use recycled materials, but it takes time and effort, they need to take tests to see of what quality the product is going to be, and how the fibres will react to this process. They explain that this could be a good way to reuse their waste, instead of paying for it. *Wool2* collaboration with a company that makes new products from their returned materials. *Light2* is in a dialogue with some of the factories regarding the use of recycled materials. It is often expensive, and there are two issues:

1. Is the customer willing to pay for it?
2. And will the quality and lifespan be the same?

"There are more challenges when producing jackets. Because they need special attributes such as wind and water resistance that is not easy to create from recycled materials. On some parts of the jackets, we might not be able to do it, but it is a process, and we will see. If you cannot create a jacket of the same quality as the technical jackets today, the customer will have to replace them much faster, and then the whole point is gone. We want the customers to be able to use the jackets for a very long time." *Light2* underlines.

Reuse

Wool2 are also working closely with a brand that sells used clothes and encourages all customers to not dispose of clothes but giving them to reception containers for clothes. *Wool2* have their channels for retrieving used products, and never throw away anything, including returns.

Repairs

Wool2 and *Wool3* do a lot of repairs. They want to accommodate repairs, service, and advice for the customer, so they can use the clothes even longer. *Wool2* and *Wool3* find the end-user to be more and more excited about this. They are currently working on finding ways to make the repair process more efficient. Facilitating repairs is a priority for *Heavy1*. Through events in the store or locally. In addition to the recycling of workwear, but that is reported to be difficult. *Heavy2* does minor repairs on some products, but it

depends, sometimes it is cheaper to give a new one than to do repairs because the resources needed might not be available.

Economical value from environmental efforts?

Most of the interviewees express that with some products it is profitable, but with others, it is not, but other factors must be considered. The importance of other factors, as social and environmental responsibility, and that the customer is interested in these kinds of products, are why they still use these efforts despite the higher price. Tracing the value chain, recycled material, buying certificates, and other efforts are more expensive. In many cases, it could be a long-term investment if it helps to gain more customers, arrangements or win bidding rounds.

It is a growing expectation that companies have certifications and customers are getting more and more environmentally aware, but many interviewees told us that there is little willingness to pay for this. *Wool1* said that the cost must, in this case, be carried by other parts of the value chain internally, the whole way down to the farmer. While the others said that the customers must pay for the whole cost. *Light1* has a lower volume and operates in a niche market. The company thinks that larger companies with high volumes will start with most of the environmental efforts, and then the smaller companies will follow.

"Some competitors have introduced a very environmentally friendly strategy for some products. Later this has proven to not be profitable at all. We do not wish to make products that are not sold so there is a balance there. What we said earlier about "buying certificates" just to have them, is about marketing." underlines *Light2.*

Light2 have regular tests and close relations with suppliers, which helps them to ensure that those products meet the standards they want. They do not want to spend a lot of money on a certificate if the return is not there. There are two arguments:

1. They might win bidding rounds by having certificates that give them a certain appearance.
2. There must be a reason behind buying the certificates if it is going to be profitable.

The strategy of *Light2* is to go step by step and launch their backpack with recyclable materials first, to see what the price level will be and how the market responds to it.

6 Discussion

6.1 Economy and profitability

The answers from *appendix A* concerning how profitable sustainable solutions is for the companies are scattered. Some companies indicate that sustainable solutions are profitable to a degree while some say that they are not. For the latter segment, answers received were among others a belief that their current investments in sustainable procurement will be profitable in the future or an increased reputation for their perceived environmentally friendly engagement. One company mentioned the balance between exaggerating their investments but at the same time communicate them out fully, so the company attracts the costumers appreciating these investments. In general, there is a phenomenon when firms are exaggerating their environmental efforts to gain more sales. While taking advantage of the arising sustainability interest among the customers. This concept is called Greenwashing and is defined by Delmas and Burbano (2011) as "Greenwashing is the act of misleading consumers regarding the environmental practices of a company (firm-level greenwashing) or the environmental benefits of a product or service (product-level greenwashing)".

The authors describe a growing market for green products and services and a lack of regulations for communication. Therefore, a high risk of greenwashing can be suspected. In the case of the companies interviewed in this thesis, many of them had implemented one or several environmental policies. Not all, but many of these policies demanded several months of gathering data to be shared with the certification companies. It is both demanding but also challenging to comply with all the obligations during a long process of becoming certified for some of the certifications out there. But far from all of them take several months to fulfil.

A strong focus on transparency was found concerning the wool segment, as well as a focus on supply chain mapping. This aligns with Cattermole (2016), that the apparel industry is changing towards increased transparency because of increased pressure from customers, non-governmental organizations and earlier revelations of large apparel companies operating with poor social conditions and a breach or lack of chemical restrictions. At the

same time, the increased use of social media changing the dynamic between provider and consumers, and forces companies to rethink the way they are operating. Which on one hand makes the products more expensive, while on the other, the customers, suppliers or other parts of the supply chain are the ones which will have to pay for it. But there is a balance between transparency (tracing the origin of the product) and price.

The survey by Virke, referring to *Appendix B,* found that 72 per cent of 600 companies are prioritizing environmental efforts, but there are divided opinions on whether such efforts are economically profitable or not. Which is very similar to the results found in this thesis, that there is a very large focus on the environment, but the profitability is still questionable and it is unclear how such efforts can be fully aligned with a functioning business model. Perhaps the question should rather be,

How can environmental efforts be economically profitable for the future? There is a pressure on efficiency from the investors to make the operations profitable while at the same time prioritize sustainability, as supported by Renukappa *et al.* (2016).

There are producers of remanufactured and recycled products, with the processes still being in early development and costly at the start for the companies to implement the practice. It could be difficult for small companies as one of our interviewees emphasizes, both in terms of knowledge and monetary resources. Which makes it more natural for larger companies to start the processes and be a pioneer to smaller and upcoming businesses. From the results, larger companies also have more comprehensive guidelines enforced through their code of conducts. Supported by Vluggen *et al.* (2019), larger projects tend to be more thoroughly managed by sustainability policies, while smaller ones are not. It can be expensive to understand the complexity of sustainability if external consultants and specialists need to be contacted, but also difficult to manage such policies internally. This is where external certifications are useful, therefore this will be discussed in the following part.

6.2 The certifications

All companies we interviewed had requirements towards their suppliers and factories to be certified and follow national regulations according to ISO standards as a part of their criteria. Not all of these are specialized towards environmental conditions, but also involves social conditions and security regulations as well. Bluesign® Oeko-tex®, Reach, Intertek and The Swan ecolabel are examples of certifications that the companies are involved within various ways through their suppliers and factories.

The certifications can make it easier for companies to handle complex matters and receive expert help from the certification providers. Especially when it comes to identifying hazardous chemicals. They provide external quality controls, facility conditions, water usage, chemicals and working conditions. Three of the interviewees rely fully on their quality controllers when it comes to environmental issues and believes they can manage these processes without paying to label the product with a brand. By having strong relations, and regular visits, many companies can maintain a strong relationship over time, reducing the need for external controls, and reducing costs.

On the other hand, an argument in favour of using third party certifications is that it puts pressure on the suppliers and monitors the whole supply chain. It makes it easier for other companies to start using the certifications and helps to spread and share knowledge. The experts working at the companies can provide guidelines and information when strategic procurement decisions are being made. Also, it was informed from two interviewees that some companies are starting to demand certifications on the products, especially by the public sector or very large corporations, certifications can be a criterion to be a part of the bidding process.

There are more certified providers and manufacturers in Europe, and more pressure from the governments, as informed by one of the interviewees. Seven of our interviewees have moved or are currently in the process of moving their production partially or fully to Europe. Which makes it easier to find certified suppliers and provides a larger cluster for sharing knowledge. As well as having a certified product helps to signal towards the customer that sustainability concerns have been taken care of, and the producers have taken some degree of responsibility towards the environment and the local community.

The mentioned aspect could more increasingly be important in the future since it is reported a huge increase in awareness from customers in the last couple of years and is likely to continue to grow in the future.

Some of the challenges are for companies to find the balance between solely paying for a certificate, and doing the processes themselves, saving money and maintaining control. There are many different certifications and can be very difficult for companies to gain an overview and find the right information. It is difficult to know the difference, and exactly what they get if they use it. Some important things to consider can be how does it look for the brand, how known are the certifications, how difficult is the process, paperwork, questions towards the suppliers. These questions should be a part of the total assessment. Five of our interviewees felt that there is no need to buy extra certifications for their products in terms of environmental issues when they already have ISO standards regarding the qualities of the product, which is already a thorough process. The ISO standards, among others, help to put pressure on suppliers and makes it easier for other smaller brands to understand and follow regulations through the supply chain. When monitoring suppliers, the certifications can be a helpful tool, but is in itself not always enough.

6.3 Monitoring and follow up

Contracts are vital to understand the buyer and sellers' obligations, agreements, and roles. The findings presented in the results were among others, that transparency and monitoring of the suppliers seem to be more important for the companies buying wool. Reasons for this seem to be the public interest in the welfare of the animals. As a bonus these companies could trace the wool back to the region it came from. Corresponding with the principles of Leagile as a sourcing strategy by working together with the supplier, providing flexibility and predictability. Some even had larger ambitions and wished to adopt blockchain technology in their business model, providing a QR code on their product labels, giving the customer direct information from where the specific wool came from.

One of the two large international companies providing workwear also emphasized a transparent supply chain, meaning they strongly controlled their suppliers, and kept strict monitoring and control of the contracts. One could interpret this in a way that large

international companies have more to lose when it comes to its reputation due to its enormous consumer base and perhaps more pressure from the stakeholders.

The rest of the companies had a more relational based approach with an emphasis on trust and reputation towards their suppliers. Which in its own way is mentioned by Petersen and Østergaard (2018) to be very important for inter-organizational relations. This was both long-term agreements and collaborations with frequent visits from the suppliers, and the focal firms visiting them. The smaller companies with a small customer base might not face the same pressure, and from fewer customers, ordering in smaller quantities. It could also be the case that they do not have the same resources for monitoring and surveillance as the larger companies. The larger companies draw benefits of the concept of economies of scale and tend to be price-oriented due to this. Such companies also have resources to source the market more easily for new suppliers filling their demands and requirements.

Much of the monitoring is performed through the certifications, at least from the view of the buying firms, it is reassuring to them not being forced to take any actions themselves. Three of eight companies have environmental guidelines through their code of conduct. There is a lack of individual monitoring of environmental concerns and no use of contracts to enforce environmental obligations. Those are governed by the external certifications. One could say the companies buying these certificates safeguard themselves and therefore pay themselves out of the workload of controlling their suppliers and supply chain. On the other hand, the expertise found from those certifications can be valuable and make it easier by systematically working towards sustainable solutions instead of having every single company using their own procedures. When considering the environmental impact, it is important to take the life cycle of the product into account.

6.4 Life Cycle Assessment

Life cycle assessment has gained a lot of attention lately. Nevertheless, many of the interviewed companies did not seem to be familiar with the term Life Cycle Assessment, but the ideas behind LCA was familiar. Especially when concepts were dismantled into individual parts, like taking responsibility for a product throughout its lifecycle, i.e. Cradle-to-Cradle. The interviewees, therefore, argued they performed a modified version of LCA for their products. One extensive example was their investment of excellent

quality materials which often exceeded the expectations of the customers, with products that lasted for years of wear and tear. All responding companies believed that there extended focus on excellent quality would help them keep the customers, and therefore have returning customers.

Other interesting examples are the focus on the 4 Rs, Recycle, Reuse, Repair, and Remanufacture. The use of recycled materials existed to an extent for some of the companies, but they did not use their materials, instead, they bought materials from other companies, specializing on this, further many of the companies were in the early stages of research and development of products with recycled materials. None of our participating companies did reuse or remanufacture their materials at this point, but some had an ambition of this for the future.

Many of the companies we interviewed performed repairs of their clothes, for one company this was at first done as Pro bono public service, in the later years they had started to charge a fee for this service. This was also the case for roughly half of our participating companies, e.g. repairs have become a part of their aftermarket sales. A motivating example of LCA put into practice is the Swedish jeans company Nudie Jeans®. The company is offering aftermarket services such as free repairs at designated repair shops around the world, free repair kit to bring home, and a mobile repair station on tour (Nudie Jeans 2020). This has been given as a Pro bono public service since 2014, regardless of where the customers have purchased the jeans (Borromeo 2014). The authors also believe the after-market sale for clothes has the potential to grow in the years to come due to the rising demand for sustainability. The authors do raise issues with this service in a high-cost country such as Norway, where wages are far above many other European countries.

It takes a long time and is a complex process to develop routines for a fully functional LCA of products that are already in established business concepts. Having to implement new routines can be costly and managers are not always willing to adapt to new changes that are time-consuming. From those companies who focused on developing sustainability clothes, the customers were not always willing to pay extra for these types of goods. *Light2* was the company who distinguishes themselves from the other when they said there is a balance which needs to be met to avoid getting an overstock of the sustainable clothes.

“Some competitors have introduced a very environmentally friendly strategy for some products. Later this has proven to not be profitable at all. We do not wish to make products that are not sold so there is a balance there. What we said earlier about “buying certificates” just to have them, is about marketing.” Says, *Light2.*

If the company producing sustainable clothes at an additional cost, then realise the customers are not willing to pay the demanding price for it, they will face problems. One scenario is if they have a large overstock or must sell items at a discounted price. By doing so, they will therefore not gain the profit they had aimed for and might lose money. Alternatively, they might discard their clothes, e.g. incinerate them. This has been reported to be done by larger companies, not willing to sell their clothes to other than high-end customers (BBC News 2018). Therefore, each company need to perform well-executed market research to find the willingness to pay for each item. If not, they risk facing the mentioned situations above, and all effort might be for nothing. Also, this does not help either the consumer nor the planet and therefore might be more harmful to the environment than the initial incentive of producing environmentally sustainable clothes. *Light1* handled the overstock problem by solely ordering small batches, e.g. following the principles from lean where the items are “pulled”, based on the order itself.

Regardless of this fact, most companies thought it was worth the investment because they believed sustainability would gain even more interest in the coming years by the public. Worth mentioning is the opinion of the one company that meant it was up to the supply chain to bear this increased cost, and not to the end-costumers. Combined with the discovery that customers are less willing to pay such products. Because of this, logistics will play a major role in the successful implementation of sustainable clothing, for instance in the procurement process. Still, there is a balance between optimizing the supply chains and increasing the prices of the end-product.

7 Conclusion

The thesis has performed a multiple case study providing information from industry practices in Norway within clothing supply chains. Focusing on relatively known brands, this thesis can add some practical context to the literature. Most consistently found, there is an increased focus from the companies regarding sustainability, led by increasing customer demands in the last two years. People are getting more and more environmentally conscious. Additionally, companies are mapping their value chains to increase transparency, especially within the wool sector. Seven of eight companies are moving parts or their entire production to Europe, which gives more control, transparency, and more flexibility. There is also reported to be more governmental pressure regarding sustainability issues, on suppliers and factories located in Europe. Less over-production, but extensive focus on higher quality, leads to less waste and hopefully less over-consumption and possibly new jobs in the form of maintenances and repairs. These elements above align which is the objective of the UNs' 17 sustainable development goals 11 (sustainable cities and communities) and 12 (responsible consumption and production).

All companies use external third-party certifications to ensure sustainability through the supply chain, while five of eight have specifications directed specifically towards environmental issues (water usage, chemicals, emissions). Using a certification is easier for the companies in terms of expertise and time, as well as it provides insurance towards the customer. Still, the certifications are expensive and there is a trade-off between sustainability while finding the best solution and still stay profitable because of the low margins, especially in the outdoor wear industry. Some companies govern and control the supply chain themselves, were key points to ensure environmental sustainability are: buying material and fabrics directly from the producer, having long term relations with the suppliers, regular quality control at the factories, and testing of the incoming goods.

Essential for those companies interviewed are there long-term relations with their suppliers. This gave enhanced the trust of the focal firm and made it easier to monitor and follow up the supplier. Sustainability issues are not stipulated into contracts from our cases, and environmental sustainability is governed mostly through certifications. Therefore, long-term relations and certifications, together, play a vital role. An extensive focus on LCA could help to ensure sustainable procurement by concentrating more on

recycling, reuse, repair, remanufacture, and also encourage research and development between the suppliers and focal firms.

8 Limitations and further research

This chapter finalizes our thesis and presents our limitations and suggestions for further research. First, the outdoor industry in Norway had huge difficulties at the initial start of our work, after some time many companies went bankrupted or were sold to other firms. This naturally changed the situation and the structure of the sports industry in Norway. During the spring, many Norwegian sports companies had struggled with large storages, low prices, and the aftermath of the poor winter season. These events have been discussed and evaluated between the authors but eventually, we decided not to includes these events in this thesis. Lastly, in the light of the aftermath, and given more time, we could have given more attention to synthetic fibre, and especially on the supply chains. This thesis does not balance them evenly but has an excess focus on natural fibre.

For further research, we recommend doing more case studies, use a larger scope, preferable from several countries, especially in neighbouring countries. An interesting phenomenon to focus further on is the dissonance between increased environmental consciousness, but a lack of willingness to pay for it. We also believe a focus on all the elements from the three pillars could give future research an even more comprehensive view of sustainability. At last, it could be interesting to interview the suppliers, to gain the full perspective. A full study, involving the suppliers could be necessary to gain a more holistic view of the procurement process.

Reference list

Aktin, Tülin, and Zeynep Gergin. 2016. "Mathematical Modelling of Sustainable Procurement Strategies: Three Case Studies." *Journal of Cleaner Production* 113: 767–80. https://doi.org/10.1016/j.jclepro.2015.11.057.

Ambler, S W, and M Holitza. 2012. *Agile for Dummies (IBM Ltd. Ed.). Hoboken*. NJ: John Wiley & Sons, Inc.

Appelbaum, Richard P. 2008. "Giant Transnational Contractors in East Asia: Emergent Trends in Global Supply Chains." *Competition & Change* 12 (1): 69–87. https://doi.org/10.1179/102452908x264539.

Axinn, William G, and Lisa D Pearce. 2006. *Mixed Method Data Collection Strategies*. Cambridge University Press.

BBC News. 2018. "Burberry Burns Bags, Clothes and Perfume Worth Millions." BBC News. 2018. https://www.bbc.com/news/business-44885983.

Bluesign®. 2020. "Blue Way for Business." https://www.bluesign.com/en.

Bonke, Jens, and Peter Fallesen. 2010. "The Impact of Incentives and Interview Methods on Response Quantity and Quality in Diary-and Booklet-Based Surveys." In *Survey Research Methods*, 4:91–101.

Borromeo, Leah. 2014. "A Swedish Denim Label Wants to Change the Way We Wear Our Jeans." Guardian News & Media Limited. 2014. https://www.theguardian.com/sustainable-business/nudie-swedish-denim-label-jeans.

Börsch-Supan, Axel, Ulrich Krieger, and Mathis Schröder. 2013. "Respondent Incentives, Interviewer Training and Survey Participation." *München: Munich Center for the Economics of Ageing (MEA)*.

Bratt, Cecilia, Sophie Hallstedt, K. H. Robèrt, Göran Broman, and Jonas Oldmark. 2013. "Assessment of Criteria Development for Public Procurement from a Strategic Sustainability Perspective." *Journal of Cleaner Production* 52: 309–16. https://doi.org/10.1016/j.jclepro.2013.02.007.

Cattermole, Amanda. 2016. "Transparency Is the New Green." *AATCC Review* 16 (1): 42–47. https://doi.org/10.14504/ar.16.1.2.

Christopher, Martin. 2016. *Logistics and Supply Chain Management*. Fifth. Pearson.

Commission, European. 2019. "EU: Green and Sustainable Public Procurement." 2019. https://ec.europa.eu/environment/gpp/versus_en.htm.

Committee, House of Commons Environmental Audit. 2019. “Fixing Fashion: Clothing Consumption and Sustainability.” London: UK Parliament.

Comtrade. 2020. “United Nations Commodity Trade Statistics Database.” U.N. 2020. https://comtrade.un.org/.

Crespin-mazet, Florence, and Emmanuelle Dontenwill. 2012. “Journal of Purchasing & Supply Management Sustainable Procurement : Building Legitimacy in the Supply Network.” *Journal of Purchasing and Supply Management*, 1–11. https://doi.org/10.1016/j.pursup.2012.01.002.

Creswell, John. 2018. *Research Design : Qualitative, Quantitative & Mixed Methods Approaches*. Edited by J David Creswell. *Qualitative, Quantitative and Mixed Methods Approaches*. 5th editio. Los Angeles, California: Sage.

Daudin, M L, and H Kadjar. 2010. “Etude Sur Le Reporting Des Grands Groupes Internationaux En Matieere d’achats Responsables—Analyse de La Communication Externe de 125 Entreprises Asiatiques, Américaines et Européennes Du Global 500.” *ORSE (Observatoire Sur La Responsabilité Sociétale Des Entreprises) and ECOVADIS—Sustainable Supply Management, September*.

Delmas, Magali A, and Vanessa Cuerel Burbano. 2011. “The Drivers of Greenwashing.” *California Management Review* 54 (1): 64–87.

Elkington, John. 1998. “Partnerships from Cannibals with Forks: The Triple Bottom Line of 21st-century Business.” *Environmental Quality Management* 8 (1): 37–51.

Finnveden, Göran, Michael Z Hauschild, Tomas Ekvall, Jeroen Guinée, Reinout Heijungs, Stefanie Hellweg, Annette Koehler, David Pennington, and Sangwon Suh. 2009. “Recent Developments in Life Cycle Assessment.” *Journal of Environmental Management* 91 (1): 1–21.

Flick, Uwe, Ernst von Kardoff, and Ines Steinke. 2004. *A Companion to Qualitative Research*. Sage.

Force, Sustainable Procurement Task. 2006. “Procuring the Future-Sustainable Procurement National Action Plan: Recommendations from the Sustainable Procurement Task Force.” *Department for Environment, Food and Rural Affairs, London, Available at: Www. Gov. Uk/Government/Uploads/System/Uploads/Attachment_data/File/69417/Pb11710-Procuring-the-Future-060607. Pdf (Accessed 17 June 2017)*.

Galankashi, Masoud Rahiminezhad, and Syed Ahmad Helmi. 2016. “Assessment of Hybrid Lean-Agile (Leagile) Supply Chain Strategies.” *Journal of Manufacturing*

Technology Management.

Gibbs, Graham R. 2008. *Analysing Qualitative Data*. Sage Publications.

Gimenez, Cristina, Vicenta Sierra, and Juan Rodon. 2012. "Sustainable Operations: Their Impact on the Triple Bottom Line." *International Journal of Production Economics* 140 (1): 149–59. https://doi.org/10.1016/j.ijpe.2012.01.035.

Halldórsson, Árni, and Jesper Aastrup. 2003. "Quality Criteria for Qualitative Inquiries in Logistics." *European Journal of Operational Research* 144 (2): 321–32.

Hardin, Garrett. 1968. "The Tragedy of the Commons." *Science* 162 (3859): 1243–48.

Herrmann, S. 2017. "A New Textiles Economy: Redesigning Fashion's Future." *Ellen MacArthur Foundation.*

Horne, Ralph, Tim Grant, and Karli Verghese. 2009. *Life Cycle Assessment: Principles, Practice, and Prospects*. Csiro Publishing.

Hox, Joop J, and Hennie R Boeije. 2005. "Data Collection, Primary versus Secondary." *JSTOR*.

Jia, Peng, Kannan Govindan, Tsan-Ming Choi, and Sivakumar Rajendran. 2015. "Supplier Selection Problems in Fashion Business Operations with Sustainability Considerations." *Sustainability* 7 (2): 1603–19.

Johnsen, Thomas, Mickey Howard, and Joe Miemczyk. 2014. *Purchasing and Supply Chain Management: A Sustainability Perspective*. 2nd ed. Routledge.

Kalubanga, Matthew. 2012. "Sustainable Procurement: What It Is and Practical Implications in Managing Procurement and Supply Chain Processes." *International Journal of Economics and Management Sciences* 1 (7): 1–7.

Keough, Wendy. 2012. "The Toyota Way to Lean Leadership: Achieving and Sustaining Excellence Through Leadership Development [Review]/Liker, Jeffery K. and Gary L. Convis." *Journal of Applied Christian Leadership* 6 (2): 135–36.

Kerr, John, and John Landry. 2017. *Pulse of the Fashion Industry*. Global Fashion Agenda.

Koppensteiner, Sonja & Udo, Nathalie. 2009. "Production Management by Using Tools of Lean Manufacturing." In *An Agile Guide to the Planning Processes*. Project Management Institute. https://www.pmi.org/learning/library/agile-guide-planning-agile-approach-6837.

Krishnamurthy, Rajesh, and Charlene A Yauch. 2007. "Leagile Manufacturing: A Proposed Corporate Infrastructure." *International Journal of Operations & Production Management*.

Lavrakas, Paul J. 2008. *Encyclopedia of Survey Research Methods*. Sage Publications.

Modint. 2015. “Recycled Fibers: From Virgin to Eternity, CR Factsheet.” Modint. 2015. https://modint.nl/2015-09-03/wp-content/uploads/2015/09/3.-recycled-fibers-dh-28.10.14.pdf.pdf.

Muthu, Subramanian Senthilkannan. 2014. *Assessing the Environmental Impact of Textiles and the Clothing Supply Chain*. The Textile Institute Book Series. Woodhead Publishing. https://books.google.no/books?id=QAujAgAAQBAJ.

———. 2015. *Handbook of Life Cycle Assessment (LCA) of Textiles and Clothing*. Woodhead publishing.

Naylor, Ben, Mohamed Naim, and Danny Berry. 1999. “Leagility: Integrating the Lean and Agile Manufacturing Paradigms in the Total Supply Chain.” *International Journal of Production Economics* 62 (1–2): 107–18.

Naylor, J Ben, Mohamed M Naim, and Danny Berry. 1999. “Leagility: Integrating the Lean and Agile Manufacturing Paradigms in the Total Supply Chain.” *International Journal of Production Economics* 62 (1): 107–18.

Nordic Swan. 2020. “Innkjøpernettverk.” 2020. https://www.svanemerket.no/innkjop/innkjopernettverk/.

Nudie Jeans. 2020. “The Sustainable Product.” Nudie Jeans. 2020. https://www.nudiejeans.com/sustainability/sustainable-products#free-repairs-for-life.

Oeko-tex®. 2020. “STeP by OEKO-TEX®.” 2020. https://www.oeko-tex.com/en/our-standards/step-by-oeko-tex.

Petersen, Bent, and Kim Østergaard. 2018. “Reconciling Contracts and Relational Governance through Strategic Contracting.” *Journal of Business and Industrial Marketing* 33 (3): 265–76. https://doi.org/10.1108/JBIM-09-2016-0223.

Powell, Daryl, Jan Riezebos, and Jan Ola Strandhagen. 2013. “Lean Production and ERP Systems in Small- and Medium-Sized Enterprises: ERP Support for Pull Production.” *International Journal of Production Research* 51 (2): 395–409. https://doi.org/10.1080/00207543.2011.645954.

Rafi-Ul-Shan, Piyya Muhammad, David B. Grant, Patsy Perry, and Shehzad Ahmed. 2018. “Relationship between Sustainability and Risk Management in Fashion Supply Chains: A Systematic Literature Review.” *International Journal of Retail and Distribution Management* 46 (5): 466–86. https://doi.org/10.1108/IJRDM-04-2017-0092.

Renukappa, Suresh, Akintola Akintoye, Charles Egbu, and Subashini Suresh. 2016. “Sustainable Procurement Strategies for Competitive Advantage: An Empirical

Study." *Proceedings of Institution of Civil Engineers: Management, Procurement and Law* 169 (1): 17–25. https://doi.org/10.1680/jmapl.15.00006.

Rewers, Paulina, and Justyna Trojanowska. n.d. "Production Management by Using Tools of Lean Manufacturing." http://wsl.com.pl/tl_files/wydawnictwo/publikacje/logistics_management_2016/Logistics_Management-modern_development_trends_part1_chapter_3.pdf.

Robson, Colin. 2002. *Real World Research: A Resource for Social Scientists and Practitioner-Researchers*. Vol. 2. Blackwell Oxford.

Rosa, La, and Grammatikos. 2019. "Comparative Life Cycle Assessment of Cotton and Other Natural Fibers for Textile Applications." *Fibers* 7 (12): 101. https://doi.org/10.3390/fib7120101.

Runeson, Per, and Martin Höst. 2009. "Guidelines for Conducting and Reporting Case Study Research in Software Engineering." *Empirical Software Engineering* 14 (2): 131.

Ryals, Lynette J, and Beth Rogers. 2006. "Holding up the Mirror: The Impact of Strategic Procurement Practices on Account Management." *Business Horizons* 49 (1): 41–50.

Saicheua, Vaeovan, Tim Cooper, and Alistair Knox. 2011. "Public Understanding towards Sustainable Clothing and the Supply Chain."

Saunders, Mark N K. 2016. *Research Methods for Business Students*. Edited by Philip Lewis and Adrian Thornhill. 7th ed. Harlow: Pearson.

Scott, Gini Graham. 2012. *The Researcher's Bible: An Overview of Key Concepts and Methods in Social Science Research*. Booktango.

Scruggs, Caroline E. 2013. "Reducing Hazardous Chemicals in Consumer Products: Proactive Company Strategies." *Journal of Cleaner Production* 44: 105–14. https://doi.org/10.1016/j.jclepro.2012.12.005.

Singer, Eleanor, John Van Hoewyk, Nancy Gebler, and Katherine McGonagle. 1999. "The Effect of Incentives on Response Rates in Interviewer-Mediated Surveys." *Journal of Official Statistics* 15 (2): 217.

Spray, Sara. 2019. "Want To Stop Buying Clothes For A Year? 3 People Who Did Tell You How." Huffington Post. 2019. https://www.huffingtonpost.co.uk/entry/how-to-stop-buying-clothes-for-a-year_uk_5c45dd97e4b0bfa693c5c994?guce_referrer=aHR0cHM6Ly93d3cuZ29vZ2xlLmNvbS8&guce_referrer_sig=AQAAAIneakEOG8S3wpE-Ha-UDxXs5IJbcIvDEgY8SQe2UNGtMchGB9DzE4-

MHhGwkvaFrf8P7q1Fc3wVEaRYPe.

Standard Norge. 2020. “Bærekraftige Innkjøp.” 2020. https://www.standard.no/fagomrader/miljo-og-barekraft/barekraftige-innkjop/.

Ulvang. 2020. “Verdikjeden.” Ulvang. 2020. https://www.ulvang.com/no/utforsk-ulvang/barekraft/verdikjeden/.

Vluggen, Rob, Cees J. Gelderman, Janjaap Semeijn, and Marc van Pelt. 2019. “Sustainable Public Procurement-External Forces and Accountability.” *Sustainability (Switzerland)* 11 (20): 9–17. https://doi.org/10.3390/su11205696.

Walker, Helen., and Wendy Philips. 2006. “Sustainable Procurement: Emerging Issues.” *International Journal of Procurement Management* 2 (September).

Walker, Helen, Lucio Di Sisto, and Darian McBain. 2008. “Drivers and Barriers to Environmental Supply Chain Management Practices: Lessons from the Public and Private Sectors.” *Journal of Purchasing and Supply Management* 14 (1): 69–85. https://doi.org/10.1016/j.pursup.2008.01.007.

Weele, Arjan J. Van. 2010. *Purchasing and Supply Chain Management*. 5th ed. South-Western Cengage Learning.

Wolfe, Isobella. 2017. “How Ethical Is Patagonia?” GoodOnYou. 2017. https://goodonyou.eco/how-ethical-is-patagonia/.

WWF. 2007. “Cleaner, Greener Cotton: Impacts and Better Management Practices.” https://wwf.panda.org/?115940/Cleaner-greener-cotton-Impacts-and-better-management-practices.

Yazan, Bedrettin. 2015. “Three Approaches to Case Study Methods in Education: Yin, Merriam, and Stake.” *The Qualitative Report* 20 (2): 134–52. https://nsuworks.nova.edu/tqr/vol20/iss2/12%0AThis.

Yin, Robert K. 2013. “Validity and Generalization in Future Case Study Evaluations.” *Evaluation* 19 (3): 321–32. https://doi.org/10.1177/1356389013497081.

Yin, Robert K. 2018. *Case Study Research and Applications : Design and Methods*. Sixth Edit. Los Angeles: SAGE.

Appendices

Appendix A: Multiple Choice Questions

Question 1	To what extent is the environment included in the business strategy					
	To a very large extent	To a large extent	Neither nor	To a small extent	To a very small extent	Dont know
Outdoor	3	1	0	0	0	0
Workwear	2	1	0	1	0	0

Question 2	Consider the following statement: "In our company, we are concerned about the environment"					
	To a very large extent	To a large extent	Neither nor	To a small extent	To a very small extent	Dont know
Outdoor	2	2	0	0	0	0
Workwear	2	2	0	0	0	0

Question 3	Consider the following statement: "It is economically profitable to introduce environmental measures"					
	To a very large extent	To a large extent	Neither nor	To a small extent	To a very small extent	Dont know
Outdoor	0	1	2	0	0	1
Workwear	1	0	1	2	0	0

Multiple Choice questions from our interview (own productions).

Appendix B: Results from a survey by Virke

«Det lønner seg økonomisk å innføre klima- og miljøtiltak» - Ta stilling til følgende påstander:

	Antall ansatte						Secto
	TOTAL	2-4 ansatte A	5-9 ansatte B	10-19 ansatte C	20-49 ansatte D	50-99 ansatte E	
BASE	**600**	**161**	**122**	**119**	**148**	**50**	
1 I svært stor grad	17%	14%	17%	30% ABDE	11%	16%	
2 I stor grad	31%	29%	28%	26%	40% ABC	34%	
3 Hverken eller	27%	24%	34%	24%	26%	28%	
4 I liten grad	12%	17% B	7%	10%	14%	12%	
5 I svært liten grad	8%	12% CE	11% E	4% E	6% E		
Vet ikke	4%	3%	3%	5%	3%	10%	
MEAN	2,6	2,8	2,7	2,3	2,6	2,4	
Standard Deviation	1,2	1,2	1,2	1,2	1,1	0,9	
TOTAL	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	

Sign.level: 95%

«I virksomheten vår er vi opptatt av miljø- og klima» - Ta stilling til følgende påstander:

	Antall ansatte					
	TOTAL	2-4 ansatte A	5-9 ansatte B	10-19 ansatte C	20-49 ansatte D	50-99 ansatte E
BASE	**600**	**161**	**122**	**119**	**148**	**50**
1 I svært stor grad	27%	24%	30%	34%	23%	24%
2 I stor grad	45%	46%	39%	37%	53% BC	46%
3 Hverken eller	21%	19%	22%	21%	19%	24%
4 I liten grad	5%	6%	6%	7%	3%	2%
5 I svært liten grad	3%	5%	3%	2%	2%	4%
Vet ikke						
MEAN	2,1	2,2	2,1	2,1	2,1	2,2
Standard Deviation	1,0	1,0	1,0	1,0	0,9	1,0
TOTAL	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Sign.level: 95%

I hvilken grad inngår miljø og klima i virksomhetens strategiarbeid?

		Antall ansatte				
	TOTAL	2-4 ansatte A	5-9 ansatte B	10-19 ansatte C	20-49 ansatte D	50-99 ansatte E
BASE	**600**	**161**	**122**	**119**	**148**	**50**
1 I svært stor grad	14%	9%	13%	20% A	13%	22% A
2 I stor grad	32%	26%	31%	32%	43% AB	28%
3 Hverken eller	27%	25%	23%	26%	28%	40% AB
4 I liten grad	14%	16% E	21% CE	10%	14% E	4%
5 I svært liten grad	11%	23% BCDE	11% D	9% D	3%	6%
Vet ikke	2%	3% E	2%	3%	1%	
MEAN	2,8	3,2	2,8	2,6	2,5	2,4
Standard Deviation	1,2	1,3	1,2	1,2	1,0	1,1
TOTAL	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Sign.level: 95%

Appendix C: Simplified version of the Interview guide for the semi-structured interviews

Interview guide

Question 1

How is the communication between development, strategical procurement, and production?

Question 2

What are your criteria when selecting suppliers?

Question 3

In short – What are the procedures for monitoring your suppliers?

Question 4

To what degree do you have control of your sub-suppliers?

Question 5

What types of procurement-contracts does your company operate with?

Question 6

What parts of the products life cycle does your company take responsibility of?

**The original interview guide was in Norwegian*

Appendix D: Certificate from our donation to Red Cross' work in Syria.