LUNDS UNIVERSITET

Green is the New Black

Identifying and exploring the drivers of eco-innovation and environmentally-sustainable product development in fashion companies in Sweden and Denmark

Masters in Management:
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Abstract

Growing concerns and sentiment about the negative environmental effects of the fashion industry pressure fashion companies to adopt eco-innovation and pursue more environmentally-sustainable product development. This study explores and examines the drivers of eco-innovation and environmentally-sustainable product development in small- to medium-sized fashion firms in Sweden and Denmark, with the purpose of identifying and understanding the key factors that drive eco-innovation and sustainable product development in the fashion industry. Using a qualitative research approach, data was collected from key industry professionals including managers within sustainability, operations, and business development. The data was then analysed to identify the common drivers and catalysts of eco-innovation within the case study companies. The findings reveal three key drivers of eco-innovation and environmentally-sustainable product development in fashion companies in Sweden and Denmark. Firstly, environmental sustainability is found to be a core element of the company's identity and brand, acting as an 'inner vision' that drives eco-innovation and more sustainable practices. Secondly, internal policies play a vital role by providing ambitions and requirements to incorporate eco-friendly practices that the company is held accountable to. Finally, developing a unique product differentiation strategy that aligns with growing sustainability concerns from consumers, policymakers, and the industry in general acts as a driver for eco-innovation and sustainable product design. By understanding the drivers behind eco-innovation and sustainable product development, companies can understand the potential of effectively integrating sustainability into their business practices. Policymakers can utilise these findings to design supportive regulatory frameworks, and consumers can use the results to help make more informed purchasing decisions. Ultimately, this research contributes to facilitating a more sustainable and responsible fashion industry in Sweden, Denmark, and globally.

Keywords: eco-innovation, sustainable product development, sustainable fashion, environmental sustainability, eco-design.

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1. Introduction

Sustainability has become a key issue for businesses across various industries in the world (Lee & Faff, 2009). The fashion industry is a major contributor to the global economy and is of high importance to the growth and development of the Scandinavian region. However, these industries are also known for their significant environmental impact. On average, approximately 200 litres of water are required to produce just 1kg of textiles (Mukherjee, 2015) and throughout production, making a pair of jeans produces as much greenhouse gases as driving a car more than 80 miles (Reichart & Drew, 2019)! For fashion firms, awareness of effects such as these should raise the question of how they can operate with minimal environmental impact and what drivers will push them to do so?

Nidumolu, Prahalad, and Rangaswami (2009) argue there is no alternative to sustainable development; it is a principle that is challenging companies to take better control over the lifecycles of products for improved quality of life. Traditionally, economic growth is directly dependent on innovation; at the same time, however, it is commonly associated with environmental damage (Bossle, de Barcellos, Vieira & Sauvee, 2016).

The research field of eco-innovation is becoming increasingly more relevant as there is rising pressure on environmental awareness from stringent policy measures, and more and more consumers are taking sustainability as an important factor in their consumer behaviour and intent (Bossle, de Barcellos, Vieira & Sauvee, 2016; Brico & Jensen, 2016; Hafezi & Zolfagharinia, 2018; Nordic Council of Ministers, 2019; Thøgersen & Ölander, 2002; Gouda, Jonalagedda & Saranga, 2016). Therefore, to succeed strategically, companies should consider environmental issues when developing new products.

Previous research, which is outlined in the theoretical background, has investigated drivers for innovation, and even eco-innovation, throughout the development and exploitation phases and with the aim of contributing to environmental sustainability. Studies have even shown that the adoption of eco-innovation has a positive effect on company performance (Bossle, de Barcellos, Vieira & Sauvee, 2016; Forsman, 2013). However, from my research for the theoretical background there seems to be a lack of research on eco-innovation in fashion products and the key drivers for fashion firms to develop these in Sweden and Denmark.

The purpose of this study is to investigate the major drivers of eco-innovation and identify the key motivations for innovation that fashion companies originating and operating in Sweden and Denmark face in regards to transforming their products towards more environmentally-sustainable designs. By analysing previous studies and literature to understand general drivers of eco-innovation and environmentally-sustainable product development, then investigating what the key drivers are in Sweden and Denmark in the fashion industry, the key drivers found will present an understanding of the challenges firms may face in becoming more environmentally sustainable and the opportunities that arise from addressing these.

Although the topic of fashion sustainability can also cover social and economic sustainability, this study will focus on drivers related to environmental effects although there may be drivers that are relevant to environmental *and* social and/or economic factors, too. The term 'eco' refers to 'ecological,' which in this study can be understood as a minimising of the negative impacts on the natural environment (Grubor & Milovanov, 2017).

This research can benefit a variety of stakeholders including policymakers, industry professionals, investors, and consumers. Policymakers can use the findings to help develop informed policies that foster and support attempts towards sustainable business practices in the fashion industry, and will contribute to an understanding of the impact these policies have on companies' business operations. Industry professionals can gain insights into the drivers of eco-innovation faced by other companies in this industry, and use this information to make informed decisions about sustainability strategies and investments. Since an understanding of the industry-wide drivers offers insight into the potential challenges that a firm may face in any attempt to become more sustainable, it may also provide insight into new opportunities that addressing these challenges and capitalising on these driers may present. Investors may find the results valuable in identifying companies that are leaders in sustainable practices and demonstrate potential agility in adapting to changing business environments, thus being able to make more environmentally-conscious investment decisions. The study is also relevant to the Swedish Consumer Agency, who safeguard Swedish consumer interests in line with consumer policy objectives (Swedish Consumer Agency, 2023). Finally, consumers can use the findings to make more informed purchasing decisions, and to support companies that are committed to sustainability.

Research question:

What are the drivers are of eco-innovation and sustainable product development?

The study is conducted through interviews and conference presentations to provide valid and contemporary data in both Sweden and Denmark, which is valuable not only to the fashion industry in these countries but also as a demonstration to other countries. As Sweden and Denmark are forerunners in innovation and in environmental sustainability (anonymous interviewee, n.d.), the study provides an angle that can demonstrate to fashion industries in other countries how eco-innovation can be fostered and supported from *within* the firm as well as external to it.

The concept of *driving innovation* in this study refers to the initiation, promotion, and fostering of innovation; in this case, eco-innovation and environmentally-sustainable product development initiatives. The purpose of studying Swedish and Danish fashion firms is to study them as forerunners in eco-innovation and environmental sustainability. Filippa Knutsson, founder of Swedish fashion company Filippa K, stated: 'being aware of how we impact the environment is embedded in Scandinavians' (Larsson, n.d.).

The study begins with a literature review (Chapter 2. Theoretical Background) in which key concepts are defined in-depth and previous studies on the topics of innovation, eco-innovation, fashion environmental sustainability, and consumer preferences. Following this, the study will be outlined (Chapter 3. The Study) and the case study companies will be presented, as well as why they were chosen and limitations. The discussion (Chapter 4. Discussion) will then discuss the observations form the study and convert these into meaningful key findings which are then analysed based on their usefulness for firms and the industry as a whole. This chapter will also present suggestions for future research. Finally, the conclusion (5. Conclusion) provides an overview of the usefulness of the study and the findings, their implications, and assess the results in relations to the research question.

2. Theoretical Background

There is a mix of studies and literature that highlight both external and internal factors as playing pivotal roles in environmentally sustainable innovation within companies worldwide. This literature review covers 38 academic articles and reports with the purpose of providing a theoretical background for my study and identifying and exploring the literature gap that exists. I explore drivers that have been identified and are relevant to the *product* aspect of innovation, however there may be drivers that cover multiple phases of innovation across the preceding, development, and exploitation stages.

A fashion *product* in this study refers to tangible items of clothing, also referred to as *garments*, and footwear. *Product* is limited to what relates to the concept of 'fashion,' in which the product provides the function of self-expression and personal style. The idea of a fashion 'product' limited to design and functionality in this study helps to consolidate the otherwise enormous range of research and discussion points within this topic; although it excludes the actual manufacturing process and long supply chain, it still considers the materials and resources *used* for the final product that end up in the consumer's possession. This is also because the supply chain of fashion firms often involve other companies, such as suppliers, that are not directly operating in the fashion industry and would therefore be beyond the scope of this study.

Product innovation is defined as the commercialisation of an invention by producing and marketing a new good; with invention being the creation of new or improved product through development of knowledge (Grant, 2023). Grant (2023) notes that *exploration* needs to be managed differently from *exploitation*; since fashion is fundamentally a creative industry, it must compete with efficiency for a product innovation to be exploited, or developed and put to market. Innovation, even within fashion, can occur from within the organisation itself or from accessing ideas and knowledge from the wider world (Grant, 2023).

The chapter is divided into subsections, starting with an explanation of the concepts of innovation and eco-innovation and followed by the concept of 'shared value,' which introduces the idea of environmental innovation's ability to benefit a wide range of stakeholders, not just the company itself, providing a foundational idea in which environmental innovation needs in

order to occur and succeed going forward. This sets foundations for the problematisation, where the urgency and importance of taking environmental action in the fashion industry is explained and justified that are ranked from most important to least important of the major drivers of eco-innovation in the fashion industry based on the results of previous studies that are presented and discussed. Both internal and external drivers are discussed without distinction.

I used a keyword search in online available journals via Google scholar, Google search, and through two university libraries. Keywords and concepts I used were eco-innovation, environmental sustainability, fashion sustainability, sustainable product development, competitive advantage and consumer behaviour. I have not included any articles/studies prior to the year due to the contemporary nature of the topic, especially in related to market pull, regulations, and certifications.

i. Innovation and Eco-Innovation: Definitions and relevance

a. Innovation

Competition is a natural phenomenon of the business world, and in order to succeed in a competitive environment companies must understand what is happening in the market. A competitive advantage in the market is said to be sustainable when competitors, current or potential, cannot readily imitate a firm's products or services (Porter, 1996; Kuncoro & Suriani, 2018; Grant, 2021). One way to gain competitive advantage is to develop and exploit new products that are, or can be, preferred by consumers in the face of competition (Kuncoro & Suriani, 2018). Therefore, to sustain business, companies should develop new thoughts and ideas into innovative products in a way that differentiates them from rivals (Ogrean, 2018).

Innovation is discovering new ways of creating value. Companies innovate to improve performance, which can be achieved through increasing demand for their products and/or reducing costs for delivering that product to the market (Khan & Al-Ansari, 2005; Hojnik & Ruzzier, 2016; Smith, 2015). A study by Kuncoro and Suriani (2018) on the meat industry found that the higher the product innovation, the higher the sustainable competitive advantage;

thus demonstrating that product innovation has a positive effect on sustainable competitive advantage. The indicators that were used to measure competitive advantage in the study were product uniqueness, product quality, and competitive price which also present as motivations or aims for undertaking product innovation.

Innovation that achieves sustainable competitive advantage helps a firm to proactively adapt their businesses to an increasingly complex and challenging global environment, transform their industries and set the foundations for new industry standards, and contribute to a reconciliation between businesses and society (Ogrean, 2018). Innovation contributes to solving wicked problems; or problems that are dealt with in the context of uncertainty and risk, where a solution requires complex, extensive cooperation and collective action (Oksanen & Hautamäki, 2015; Rittel & Webber, 1973; Camillus, 2008). Therefore, undertaking innovation can help companies to achieve firm resilience in the form of stability and adaptability. Although innovation is a risky process and both future directions of policy and regulations and consumer demand can be relatively uncertain and volatile, companies should develop the capacity to remain competitive and relevant. In an industry such as fashion, trends and competition make for a fast-paced turnaround for business activities (Stål & Jansson, 2017; Brico & Jensen 2016).

Innovations can take be categorised for firms in any industry, including in fashion. Firstly, innovations can be (a) product-based, developed to improve market position; or (b) process-based, intended to improve cost-effectiveness (Forsman, 2013; Smith, 2015). This study will focus on (a) product innovations, as defined in the beginning of the chapter.

Secondly, innovations can be (c) incremental, which consists of minor improvements to existing offerings; or (d) radical, which are riskier, offering entirely new offerings thus allowing access to new markets (Smith, 2015). Both are considered in this study without differentiation. Generally, innovation goes through phases that can be separated into preceding, development (R&D), and diffusion, or widespread adoption (Hojnik & Ruzzier, 2016; Smith, 2015).

b. Eco-Innovation

Like innovation in general, eco-innovation creates value to customers, creates new market space, is superior in competition, and creates profits. Environmental innovation's aims, however, is to also reduce negative environmental impact, create new products driven by environmental issues or to improve environmental performance (Forsman, 2013; Smith, 2015). Eco-innovation in this study refers to innovation for the purpose of improved quality for the environment as well as to improve companies' environmental performance. Additionally, eco-innovation has interchangeable terms across literature: environmental innovation, green innovation, and environmentally sustainable innovation.

Further definitions by Kemp and Pearson (2007), Horbach, Rammer & Rennings (2012), and the Eco-Innovation Observatory (2023) define eco-innovation as innovations that decrease environmental risk, such as the release of harmful substances, pollution, high levels of resource use, waste, and other environmental burdens. The OECD defines eco-innovation as "the development of products, processes, marketing methods, organisational structure, and new or improved institutional arrangements, which, intentionally or not, contribute to a reduction of environmental impact in comparison with alternative practices" (Bossle, de Barcellos, Vieira & Sauvee, 2016). It can be added to this definition that an eco-innovation can promote positive environmental effects, whether intentionally or non-intentionally. This study will focus on the product development part of the definition to limit the study to match the available resources. Most definitions of eco-innovation have two main scopes: (1) fewer adverse effects on the environment; and (2) more efficient resource use. Buhl, Blazejewski, and Dittmer (2016) even include the relevance of the *dynamic* aspect, referring to preparing for future needs.

The unique placement of eco-innovation between environmental economics and innovation gives the topic relevance across a wide span of business operations. Sustainability considerations are integrated into activities from idea generations through R&D to commercialisation, or exploitation (Ogrean, 2018). The drivers of eco-innovation can be separated from general innovation theory because whilst eco-innovations incorporate all drivers from general innovation theory, eco-innovation also considers regulatory and institutional frameworks that coerce firms to implement green practices (Hojnik & Ruzzier, 2016).

Examples of product eco-innovation, especially relevant to the fashion industry, include but is not limited to:

Table 1: Examples of product innovation (Buhl, Blazejewski, & Dittmer, 2016)

Environmentally-focused	**Traditional**
Recyclability	Quality
Recycled content	Safety
Resource efficiency (eg. fuel, textile fibres)	Price
Chemical & toxic content reduction	
Emissions-related performance	
Packaging	

The key challenge for eco-innovation is to reconcile environmentally-superior products, those with features such as above, to their traditional non-green counterparts' product characteristics, legal regulations, and customer needs. A study by Forsman (2013) on the industrial sector, another of the largest polluting industries globally, concluded that eco-innovation needs three distinct characteristics to succeed: it should create value for the customers as well as the firm, be superior in competition, and create profits for the innovators.

Forsman's qualitative study (2013) on the industrial sector, as previously mentioned, also found that the sales growth of green innovators was significantly higher at 59,3 per cent compared to the industry average of 2,7% throughout all innovation phases: preceding, development, and exploitation. Further, the successful green innovators utilised cost leadership and differentiation strategies effectively. This was even found to be irrelevant to the company's age and size. However, the results did also show that these companies also suffered efficiency-related competitive disadvantage. To the extent of my research and systematic literature review, such a study that explores the economic advantages of eco-innovation has not been undertaken within the fashion industry.

c. Examples of fashion eco-innovations

One significant eco-innovation in the product design of fashion apparel recently is textile innovations. Although not all fashion brands are producing the textiles themselves and instead often source them, the use of these has come to the public's attention lately. Swedish award-winning start-up Renewcell breaks down disposed clothes into a dissolving pulp, called Circulose®, which is then packaged into bales and sold back to the textile production value chain as an equal-quality alternative to cotton, oil, and wood (Renewcell, 2023). Refibra™ by Tencel™ similarly upcycles cotton scraps from pre- and post-consumer textile waste into a pulp that is created into a new Lyocell fabric (Tencel, 2023). These make use of disposed clothing and prevent a large portion of used garments ending up in landfill.

There are also eco-innovative textiles being produced from biowaste. One such is Orange Fiber in Italy, which creates a yarn from extracting cellulose from leftover biomaterials for the Sicilian orange juice industry. This also means that the fibre has natural antioxidants, antimicrobial, and anti-inflammatory effects (Wood, 2019). Similarly, Pinatex C in the Philippines produces a fibre from cleaning pineapple leaves via a manufacturing unit in Spain and rolling the into a felt-like textile; with all waste from this production used as biofuel. Currently, this is being used for shoe manufacturing at Hugo Boss and bags at Artesano, as well as in automotive upholstery (Wood, 2019). However, the production of such materials does require multiple stages of processing which involves chemicals such as hydrogen peroxide which is harmful to the environment. Additionally, whilst the fibres themselves are biodegradable, the finishing chemicals are not (Wood, 2019). To be viable, the textiles must also meet the needs of the consumer such as utility, durability, quality, comfort, and flexibility functions to the same, if not better, standard to their current alternatives.

Currently, it is often the best route to produce these on a larger scale, patent them, and supply to firms for further manufacturing (Wood, 2019). Danish fashion brand Ganni is a pioneer in using such fabrics. In 2022, Ganni released a tracksuit as part of their seasonal collection that was made from a biowaste material from the company Pyratex, composed of waste from the banana industry such as leaves, trunks, and branches (Ganni, n.d.a; Ganni, n.d.b). Similarly, they released a range of non-leather sandals as part of their Spring/Summer collection made with a fabric from Italian company Vegea which was composed of plant waste, mostly of which was leftover grape skins from winemaking (Ganni, 2023c). A current challenge of recycled

textiles is such as these, however, is that they are not yet widely available, often of poorer quality, and are limited to single-fibre-content (Claxton & Kent, 2020). Single-, or mono-fibre, fabrics can only provide the functionality of the fibre that it contains, whereas most clothing is composed of blended fibres which allows for improved functionality; for example, a t-shirt if 99 per cent cotton can contain 1 per cent spandex to add stretch capability. Blended fabrics, however, are more difficult to recycle as it is difficult and resource-consuming to separate the fibres for further processing (anonymous interviewee, 2023). These factors will need to be overcome if these biomaterials do become more integrated in the fashion industry.

Design ethos can also be a major form of innovation in fashion. Collections that are less trend-driven, more seasonally-adaptable and versatile in terms of fit, colour and style can drive down consumption by lessening the need for consumer purchasing and lasting through multiple seasons and, potentially, users. Hope, a high-end Swedish label, produces only unisex clothing (Hope, 2023) and Filippa K focuses on timeless, multipurpose garments, both of which are functional and relatively basic which promotes a longer product life-cycle and thus helps to minimise waste of their products (Stål & Jansson, 2017).

Different methods of offering garment recyclability are used across different fashion firms. Swedish Nudie Jeans Co, which uses old jeans from their customers to turn them into items such as bucket hats and patches (Nudie Jeans Co, 2023). Recyclability in another common method takes the form of take-back systems. Companies such as Filippa K and Nudie Jeans Co accept only their own brand in reusable condition and resell them in their own designated second-hand stores (Filippa K) or in second-hand corners in their regular stores (Nudie Jeans Co); what is not re-sellable is recycled and used for new products, as mentioned about Nudie Jeans Co in the previous paragraph (Stål & Jansson, 2017). Swedish clothing giant H&M implemented a take-back system in 2014, accepting all brands and conditions in exchange for a voucher, which then private company I:CO handles them further. One limitation of this, however, is that I:CO is a private company and therefore their operations and the actual prevalence of recycling is largely unknown due to limited transparency (Stål & Jansson, 2017).

ii. Problematisation: Environmental sustainability in the fashion industry

Each year around the world, about 100 billion pieces of clothing are produced representing 14 garments per person. Not all of these, however, will reach the final customer, ending up as textile waste (Golay, 2022). Contemporary patterns of increasing consumption creates a cycle of faster trends, a phenomenon of micro-trends or trends-within-trends, and faster time-to-consumer, which ultimately creates a much shorter product life cycle. As the fashion life cycle is becoming shorter, and in order to keep up with consumer demand, profit margins and time-to-market, companies have been forced to implement unsustainable ways of producing products (Brico & Jensen, 2016). This creates contradicting forces of fast trend-cycles becoming faster, and a more holistic, long-term alternative that fashion requires to become more sustainable in its consumption. Business models are partly to blame, as they promote an increase in consumption of clothes as the core of fast fashion is essentially planned obsolescence (Dissanayake & Sinha, 2015; Golay, 2022). Where there are shorter fashion cycles, it becomes more difficult to forecast, which leads to more overproduction or encouraging overconsumption through selling at a lower price; ultimately creating more waste (Brico & Jensen, 2016). Additionally, it is important to keep in mind that whilst fashion consumption is often thought about as only the purchase stage, it also includes the usage and end-of-use stages.

a. Emissions

In 2018, the fashion apparel industry was estimated to compile 10% of total global greenhouse gas emissions (Ganni, 2022d); equating to 2,1 billion tons of CO2 emissions, which is the same amount as the total emissions of France, Germany, and the UK together (Aldana Marin, 2022). By 2030 this figure is estimated to be 2,7 billion tonnes (Aldana Marin, 2022). The 2015 Paris Agreement states a target of 55% reduction of greenhouse gas emissions, and as the fashion industry is a major polluter, this highlights the urgency of taking industry-wide action.

Emissions from fashion consumption is not limited to only the production phase. The Waste and Resources Action Programme (WRAP), a UK-based charity, released a report that stated the annual footprint of a household's newly bought clothing along with washing and cleaning was equivalent to the emissions from driving a modern car 6000 miles and water to fill over

1000 bathtubs. In fact, according to Brico & Jensson (2016), studies have shown that 82 per cent of total energy use in a garment's life is spent on washing. This further highlights that since products are not designed to outlast wear and trends, throwing out products and buying new is contributing to harmful levels of emissions (Maats 2016).

From raw, virgin materials usage including cotton, fur, and leather to name a few, to disposal of clothing as well as water usage and incredible amounts of emissions, textile production has a largely negative effect on biodiversity throughout its entire value chain (Aldana Marin, 2022).

b. Chemicals

The production, washing, and disposal of clothes leaks toxic chemicals into the environment. For example, the largest leather export in India is located in the city of Kanpur, where 50 million litres of toxic water is poured into the river Ganges every day on which over 80 million people are dependent (Aldana Marin, 2022). Another example is when consumers wash synthetic clothes such as polyester, a textile alternative to cotton that uses far less water in its production, hundreds of thousands of tiny microfibres, or tiny strands of plastic, are released into the ocean as they cannot be filtered entirely through water treatment plants. These fibres account for 35% of all microplastics in the ocean, of which many end up eaten by sea life which then end up on our plates (Brodde, 2017). Cotton, often considered to be eco-friendly, requires large volumes of chemicals to ensure production volumes meet demand; this has devastated some regions, such as the Aral Sea in Central Asia. Once a rich and fertile land, this region of the world has become near desert-like due to the over-farming of cotton (Wood, 2019). Although cotton *can* be grown without the use of chemicals, this currently accounts for less than 1 per cent of global cotton production (Claxton & Kent 2020).

c. Water Usage

Clothing production is extremely water-intensive: one single cotton t-shirt requires 2 700 litres to produce, which is enough water for one person to drink for over two years (Reichart & Drew 2019; Skogsindustrierna, 2019). A typical cotton t-shirt of 500 grams bought in Sweden contains even more at 4 100 litres of virtual water and has required an estimated three kilograms of chemicals in the production phase alone (Stål & Jansson 2017).

d. Waste

Perhaps one of the most highlighted environmental issues of the fashion industry, 92 tons of textile waste is created each year globally; 85 per cent of this was in the US alone (Aldana Marin 2022). Every second, a garbage truck full of clothes is burned or sent to landfill (Reichart & Drew 2019)! Although it could be assessed that the most unsustainable phase where the most energy is consumed is the usage of the garment in terms of water and energy, a main issue is the end of use. According to the Reichart & Drew (2019), the average consumer bought 60 per cent more clothes in 2014 than in 2000, but kept each garment for half as long. Also, an expected 400% increase in global GDP by 2050 will only increase consumption unless we revolutionise the industry (Reichart & Drew, 2019).

Global apparel consumption is highly concentrated in three main regions, with 72 per cent of global apparel imported into the EU, US and Japan alone (Dissanayake & Sinha, 2023). Encouragement of high volumes of purchasing and the resulting mass production of apparel fuels a throwaway attitude by consumers. As textile waste often ends up in landfill and there are alternatives to this, the problem is not necessarily the waste itself but instead where it ends up (Brico & Jensen, 2016).

The production phase is also responsible for waste in the fashion industry; there is waste hidden in the supply chain. 15 per cent of the fabric is presumed to be rejected and discarded before reaching the factory. After this, when cutting clothes, a further 15 per cent of the fabric falls on the floor (Claxton & Kent 2020). A widely recognised and potential waste management strategy could be 3R's: reduce, reuse, and recycle, relevant to both producers and end consumers. Filippa K's 2023 Resort and Spring collections were entirely made out of leftover cuttings from the last collection; for example, one item was a bathing suit made from leftover velvet from the last collection.

iii. Concept of 'Shared value'

The choice of businesses to strategically aim for competitive advantage or the wellbeing of people or society by addressing issues such as those mentioned in the section above does not necessarily have to be zero-sum, in which one stakeholders benefits at the total expense of another's potential benefit. Oksanen & Hautamäki (2015) and Porter & Kramer (2011), also discussed in Grant (2023), explicitly explore the concept of 'shared value,' where economic value can arise out of producing societal value. In theory, sustainable innovation takes environmental sustainability and the corresponding wellbeing of society as basic value, therefore leaving economic growth with instrumental value. In this way, eco-innovation can be a win-win strategy.

Porter & Kramer (2011) claim that companies can create economic value by creating societal value in three ways: (1) by reconceiving products and markets, (2) by redefining productivity in the value chain, and (3) by building supportive industry clusters. In these ways, improving or creating value in one area even increases opportunity in the others. In my study, I will focus on the first concept: reconceiving products and markets, which creates both societal and economic value through serving new needs and creating product differentiation. The research will explore how businesses can become more profitable and agile by incorporating eco-innovation through shifting focus from consumer value only to including wider societal value.

A study by the Nordic Council of Ministers (2019), comprising of a survey and in-depth interviews of 1 228 youth aged 13-20 in Nordic countries, found that Nordic youth problematise the current manner of generating growth in the capitalist system, including how overconsumption and 'throwaway culture' is damaging the environment. 'Throwaway culture' refers to the single-, or limited-, use of a product before it is thrown away and is a consumer purchasing habit in which a product is bought with the expectations of throwing it away after the single- or limited-use. By creating a society based on consumption, survey respondents felt that they struggle with not buying new consumer goods, buying less, or buying longer-lasting products. They also highlight climate injustice; where many poor countries will be disproportionately affected by climate change. When asked what would make it easier to live and consume more sustainably, 73 per cent of respondents suggested sustainable products, meaning it is up to companies to initiate this change; 58 per cent stated certifications, 52 per

cent a ban on unsustainable products, and 48 per cent more information. Whilst these all suggest companies and regulations, perhaps in the form of government or other authorities, are responsible, the most common answer in the free text response to the survey for what decision-makers should do is everyone is responsible and all must take action whilst still having belief in individual effect. A step-by-step, or gradual, development and change in values is the most effective way to take communal response to having shared ideals of the good life.

Creating shared value does what businesses already do: pursue self-interest, however through a means of creating shared value connected to their particular business. A few universal examples of societal needs, benefits, and harms embodied in a company's products related to the environmental problems discussed earlier include better resource utilisation, less packaging waste, and textiles that use less water and/or microplastics.

Shared value can also consider collaborations. One strategy that Porter & Kramer (2011) suggest is to source locally, which allows firms to shorten the supply chain. Even though logistics are a relatively inexpensive part of the production process, information flows rapidly, and markets are global; sourcing locally allows for better ability to respond to changes in supply and demand. Samsøe Samsøe experimented with this with a collection of seasonal wool garments made from local, family-owned, natural, untreated and undyed wool from Fyn (Samsøe Samsøe 2022a). Not only does this shorten the supply chain, increase domestic profits, promote local industry, and contribute to the domestic economy; it also provided as a unique product differentiation tool.

Company ideals and the business model is of utmost importance to operationalise concepts such as sustainability and sustainable development so that they become value-adding to the core product offering (Stål & Jansson 2017). Not only do green products need to be more sustainable than their alternatives, but they need to offer the same, if not better, core product features as well (Stål & Jansson 2017). Secondly, brands need to link these green features and identity to the brand itself and not the industry in general which further reinforces differentiation and competition. Maats (2016) and Boradkar (2022), of Groningen and Arizona State Universities respectively, identify distinct dimensions of consumer product experience: utilitarian function, emotional/attitude or cultural style, beauty, and the belief system of a product. Whilst Maats simply expects sustainability of a product to fall under this last category, where products serve a purpose that we can empathise with or provides more meaning than its

core product offering, Boradkar identifies sustainability of the product in a category of its own. Boradkar defines 'sustainable' product design as meeting the needs of consumers today without compromising the needs of future generations. Further, he promotes that this is how we should use our resources: using lifecycle thinking to think about the products' end of its life cycle and not just how it is bought and use as an essential part of product design.

Consumers, however, need to demonstrate with their consumer power to companies that it is worth their while to make these changes and use the concept of 'shared value' in their product design philosophy. For example, plastic bags are, in fact, a lot more efficient to use than paper bags in many ways. Whilst it is widely and highly recognised that plastic bags are less than ideal for the environment compared to paper, you can usually fit much more in a plastic bag than paper as well as many more plastic bags in shipment boxes than paper bags, increasing the need for transportation for the same amount of paper bags than plastic. Additionally, although paper bags do degrade, the paper industry is extremely polluting (Boradkar 2022). By making more eco-friendly choices, including making trade-offs for factors such as convenience, consumers can help to direct companies towards more shared value-based practices. Sustainable design is design that reflects continuous value creation. In the case of fashion products this could be materials that are fit for purpose and do not compromise on functionality (Boradkar 2022).

iv. External policies and regulations

Previous studies and research have found external policies and regulations regarding environmental management in firms to be the *most significant* driver for eco-innovation across industries worldwide (Bossle, de Barcellos, Vieira & Sauvee, 2016; Hojnik & Ruzzier, 2016; Forsman, 2013). I also expect external policy to be a major driver for fashion companies in Sweden and Denmark in this study.

Global environmental degradation influences regulatory and policy decisions, presenting firms with both challenges and opportunities. A study of 20 papers on eco-innovation by Buhl, Blazejewski, and Dittmer (2016) found that strict regulations can boost eco-innovation and may have been instrumental in driving research and development (R&D) policies as well as

creating new markets. Even future regulations seemed to spur product eco-innovation (Forsman, 2013). Porter's hypothesis states that environmental regulation actually presents as a positive opportunity for innovation as it induces firms to innovate in order to reduce the costs of compliance with them (Smith, 2015). In general, stringent international regulations of environmental protection together with the rising environmental consciousness of consumers can mean eco-innovation can bring about expected early-mover advantages and ultimately charge a higher price (Forsman, 2013).

Nidumolu, Prahalad, & Rangaswami (2009) suggests that one of the first steps for businesses that undertake eco-innovation is viewing compliance as a business opportunity to, for example, make value chains sustainable, design sustainable products, and develop new platforms, and to potentially even question the status quo, such as industry standards and standardised product design. Companies can play a key role in a country's environmental performance, and consumers also rely on companies to provide eco-innovative products. In this way, companies can also drive consumer demand in this direction. This is significant because policy is often reactive, not proactive, and is not always necessarily in the best interest of society at large (Porter & Kramer, 2011).

Tsai and Liao (2017) found that along with market demand, a driving force of eco-innovation in sustainability strategy in regards to policy is government subsidies. However, public policy cannot be relied on; policy is not necessarily sustainable and what a government or organisation can give it can also take away (Ghemewat, 1986). Therefore, it is unsustainable to build a competitive advantage on this. However, as Tsai and Liao point out, environmental subsidies send signals about future policy direction which firms can exploit.

The UN's Sustainable Development Agenda includes a 10-Year Framework of Programs for Sustainable Consumption, which includes actions to promote education, consumer information, and sustainable lifestyle globally. The impact of fashion on the environment relates to many of the Sustainable Development (SD) goals, of which the Nordic countries committed to in September 2015 (Nordic Council of Ministers 2019):

Table 2: UN SDGs that are relevant to the fashion industry (UN n.d.)

(SDG6) clean water and sanitation
(SDG7) affordable clean energy
(SDG11) sustainable cities and communities – *by reducing waste and toxic chemicals and microplastics*
(SDG12) responsible consumption and production
(SDG13) climate action
(SDG14) protection of life below water
(SDG15) protection of life on land – *by reducing landfills, intensive use of water, soils, and deforestation*

Although the UN's SDGs are not binding, the Paris Agreement is a legally binding international treaty on climate change adopted by 196 countries worldwide in 2015 (UNFCCC n.d.). The Paris Agreement requires economic and social transformation through five-year cycles with increasingly higher ambition (UNFCCC n.d.). Ultimately, the goal is to limit global warming by 1,5°C and greenhouse gas emissions must peak before 2025 at the latest and decline 43% by 2030 (UN n.d.). As the second largest greenhouse gas emitting industry, the fashion industry will need to adopt new, innovative practices to manage its environmental effect and help countries to abide by the regulations.

In Europe, the EU has been a major player in establishing policy and regulations that restrict fashion companies in their environmental impact. The EU Textile Regulation No 1007/2011 aligned laws across the EU to require fashion labels to state full fibre composition of the product and state any non-textile parts of animal origin (European Commission, 2022). Recently, the EU has even introduced to its Parliament even more stringent standards to potentially be complied with by 2026 (anonymous interviewee, 2023) so simply complying with the regulations may not provide a sustainable competitive advantage, instead only having a normative effect. Some of the latest measures to potentially be complied with by 2026 include: a ban of all environmentally harmful chemicals, binding product-specific eco-design requirements aimed at increased durability and reusability of clothes as well as mandatory recycled fibre content, transparency obligation requiring large companies to disclose the number of products they destroy, and a ban on the destruction of unsold products (European Commission, 2022). Additionally, there may be a Digital Product Passport for all products including traceability of materials in the product, information relevant to repair, commercial guarantee of durability along with other key environmental aspects (anonymous interview,

2023). Danish fashion label Samsøe Samsøe has already introduced similar tags on their clothing which allows the garment's users and potential second-hand buyers to automatically create an advertisement with all the information provided regarding the item's age, size, colour, material, care, retail price and resale price amongst others (Samsøe Samsøe 2022b). The ad is then placed across social media and also on the Resell Tag website (Samsøe Samsøe 2022b). This is a prime example of first-mover advantage in promoting a longer lifecycle of their products for the consumers.

Figure 1: The Resell Tag on a Samsøe Samsøe garment for sale (Samsøe Samsøe 2022d)

Government and other architects of policy should, however, impose regulations with caution. Firms could always prioritise a strategy that yields higher profit over one with better environmental performance. A study by Hafezi & Zolfagharinia (2018) found that where government regulations were too strict, firms were discouraged from innovating new green products. This the leaves the question as to how regulations should be enforced. This is particularly relevant where firms may be economically sensitive. Stricter regulations can additionally cause firms to be more reluctant to innovate; for example, to continue to produce distinct products for different market segments rather than producing a single standard product that meets the needs of both the environmentally-sensitive and nonenvironmentally-sensitive consumer (Hafezi & Zolfagharinia, 2018). This is especially true since the risk of innovation is relatively high for new product development where firms are required to invest huge amounts into R&D without guarantee of the future product's success. Hafezi and Zolfagharinia (2018)

speculate that this may be the reason why many firms hesitate to enter the green industry. In the case of biomaterials introduced earlier in Chapter 2.i.c, large investments are required for the investigation of new materials, product development costs even more money, and textile manufacturers still need to create profits in order to be viable businesses (Wood, 2019). Policy can instrumentally influence the complex trade-off between a firm's profitability and environmental protection.

Making the fashion industry more sustainable will take time and needs to be seen as a long-term process and obligation (Brico & Jensen, 2016). However, this can be approached with short-term goals to start with, to lead both consumers and companies on the path towards environmental regeneration and sustainability. In the Nordic Youth survey on sustainability, the second biggest wish from young people to politicians was to help make sustainable choices easier, through for example banning or making it more difficult to buy single-use consumer items (Nordic Council of Ministers, 2019). Using policy as an instrument, banning one thing works by leading to the increased use of another thing which is more environmentally-friendly. They can even incentivise by subsidising to help off-set costs of transforming to more environmentally-friendly initiatives (Hafezi & Zolfagharinia, 2018).

Examples of policies governing bodies have used to address environmental concerns include carbon taxes or pollution fines, consumer incentives as often seen in the automobile industry, subsidies to manufacturers, and setting a minimum environmental and quality standard such as the EU's Ecodesign Directive which sets minimum quality requirements to improve environmental performance of household products (Hafezi & Zolfagharinia 2018).

v. Market pull

Studies and research shows that there is an increasing level of environmental concerns among consumers when it comes to fashion (Bossle, de Barcellos, Vieira & Sauvee, 2016; Brico & Jensen, 2016; Hafezi & Zolfagharinia, 2018; Nordic Council of Ministers, 2019; Thøgersen & Ölander ,2002; Gouda, Jonalagedda & Saranga, 2016). Grant (2022) even acclaims customers to be an important source of innovations; since they are the most acutely involved at matching existing products to their needs, most inventions, he claims, have resulted from tackling

practical problems out of necessity. In order for eco-innovation to be relevant to fashion firms, the customer segment first need to exist: green consumers who highly value the environmental qualities of products as a main motivation for, or contributing factor towards purchasing. Smith (2015) labels these as 'green idealists.' Customers choose to consume fashion in order to fulfil a specific need or demand, with perhaps the main motivator particularly in regards to the brands of the companies studied as to express individuality (Brico & Jensen, 2016). This also includes clothes purchased out of habit or because of the pressure to constantly redefine our identity; buying goods is a way for individuals to wish for pleasure, experiences, significance and identity in a constant search for something unique (Brico & Jensen 2016). Brico and Jensen (2016) define *consumer behaviour* as 'the study of the process involved when individuals or groups select, purchase, use, or dispose of products… to satisfy needs and desires.'

In a market economy, the perceptions and needs of consumers play a critical role in shaping the demand for products and services, and in turn, impact the industries that produce them (Mankiw & Taylor, 2006). Today, with growing concerns about environmental degradation and a heightened awareness of the need for sustainable practices, consumers are increasingly seeking out businesses that prioritise sustainability (Quantis, 2018). With a growing recognition of the potential for creative industries to be leaders in sustainability and eco-innovation despite current significant amounts of generated pollution, they must adapt their practices to meet the needs and expectations of consumers (UN Environment Programme, 2018).

A driving force behind customer demand for more environmentally-sustainable products is a popular sentiment that nature has a right to exist for its own sake (Forsman, 2013). Normative pressure from market demand and customer 'requirements' was stated as the second most significant driver of eco-innovation in studies by Bossle, de Barcellos, Vieira and Sauvee (2016) and Hojnik and Ruzzier (2016). A study by Michaud & Llerena analysed in Forsman's (2013) study found that a consumers' willingness to pay for a conventional product decreased when they learned of its environmental impact; at the same time, as consumers' environmentalism is increasing, they are willing to pay higher prices for eco-friendly products. Therefore, since environmental issues influence customer decisions, environmental innovations to reflect consumer preferences can be a unique and relevant differentiation tool to help capture unmet needs (Tsai & Liao, 2017).

As a business operating in a competitive environment, even slight, innocuous shifts in consumer preferences can weaken an entrenched brand; companies therefore must be synchronous to their surrounding environment (Ghemawat, 1986). This is particularly relevant to the fast-paced fashion industry, where firms need to plan for a the seasons a year ahead, needing to reflect current trends whilst also predicting future trends. Interestingly, a study found that overseas, but not domestic, customer pressure works as a driver of eco-innovation (Hojnik & Ruzzier, 2016). This not only suggests that eco-innovation is not just what consumers *expect*, but also indicates how innovation should be managed and projected from within a company.

Whilst consumer demand can drive companies to undertake eco-innovation, adopting new products can mean inconveniences, higher prices, and perceived lower product performance which can negatively affect eco-innovation's performance on the market (Buhl, Blazejewski, & Dittmer, 2016). Stål and Jansson (2017) explicitly identify this in stating that: "ambitions [of firms]… impose reciprocal demand upon customers to incrementally get used to paying more for more expensive sustainable and recycled materials." Additionally, changing product design can be difficult for designers in fashion as consumers have certain preconceived expectations of fit, style, and aesthetic properties associated with products from particular brands or materials (Claxton & Kent, 2020). Durability for some brands, such as Filippa K in this study, is closely associated with brand identity; collections are less trend-driven and more influenced by internal design ethos. This is known as *slow fashion* and is more common on the mid- to upper-levels of the fashion market (Claxton & Kent, 2020). With the concept of slow fashion, decreasing the number of seasons means garments become more timeless and designers and companies can focus on quality (Brico & Jensen 2016).

Studies by Hafezi and Zolfagharinia 2018 (2018) and Gouda (2016) found that consumers' willingness to pay for an environmentally-friendly product varies. Gouda's study found that consumers in emerging markets value environmental product attributes less than those in developed countries; however, interestingly, it is possible to achieve greater profits *and* environmental quality in emerging markets only in the presence of high economies of scale. Additionally, features such as fuel efficiency are attractive to regular customers who may not necessarily otherwise prioritise eco-friendly product attributes. To put this into the context of fashion, this could mirror features such as resellability. A bag designed and sold by Ganni made

of a bio-based leather alternative Ohoskin looks better on the shelf than if it were made from leather, which is an example of increased functional performance, in this case in visual merchandising but also for the consumer post-purchase (Bartley, 2023). Ultimately, sustainability is ultimately only one of the factors consumers take into account when making purchasing decisions; other factors include quality and price and the appearance; sustainable production is seen by many as an additional value (Brico & Jensen, 2016).

Thøgersen & Ölander (2002) conducted a study on a random sample of Danish consumers to test if emerging sustainable consumption patterns are influenced by individual value priorities. Their study consisted of a telephone interview throughout the entire country regarding their environmental behaviours, or more specifically, the sustainability of an individual's consumption patterns. Going into the study, they authors held the assumption that individuals hold a relatively stable set of values, and that environmental behaviour is related to a certain set of these. It is unclear whether these are firmly anchored in the individual, internalised early in life, or are instead a response to certain incidences in one's life and society; although this could explain generational values, these factors are not considered influential in shaping differences in environmentally-friendly consumer demand. However, one factor they discuss in the results of their study is the conflict between the Danish cultures of hedonism, which is highly prioritised and also benevolence, in their behaviours, and universalism. Hedonistic behaviour can also be interpreted in practice as behavioural inertia or status-quo bias. The results of their survey over one year demonstrated that although Danes are fairly considerate in their everyday consumer behaviour in terms of the environment and resource use, when environmental behaviour was stable, or did not change significantly after a year, the forces that influenced environmental behaviour were also stable; this suggests that without a catalyst, individuals may not make changes in their behaviour that prioritises the environment. This is significant because environmental and resource problems are the result of, and can only be solved by, collective action.

The limitation of the study mentioned in the paragraph above, however, is that it was conducted in 1999 and sampled a wide, unlimited range of the population's demographics at 1 090 final participants. The Nordic Council undertook a more recent survey on 1 228 youth aged 13-30 in 2019 with a median/mean age of 24/23 respectively with a focus on sustainable consumption and lifestyle. The results showed that whilst 88 per cent are very or extremely concerned about climate change issues at both local and global level, 86 per cent claimed overconsumption of

resources as one of their biggest concerns and 93 per cent stated that a more sustainable lifestyle is important, a significant 47 per cent find it difficult to maintain a sustainable lifestyle. Danish young people between 18-29 are particularly sensitive; this group reported significantly different answers and opinions on climate than the rest of the population and stated they are prepared to pay more for a transition. This suggests that young Nordic consumers of fashion are prepared and willing to make sustainable choices if available to them and that it is easiest for companies and policymakers to make green products convenient and available first before their price necessarily. The Nordic Council even recommended highlighting communicating the positives of making sustainable fashion purchases rather than the 'sacrifices' could help consumers make more eco-friendly consumption decisions. This could also help against the fact that 64 per cent of survey respondents claimed they shopped less and 48 per cent recently bought second hand, as opposed to new, clothing as a sustainable behaviour.

Customers caring about ethical and sustainable behaviour and sustainability does not necessarily translate into concrete behaviours; this can be described as an 'attitude-behaviour gap' (Brico & Jensen, 2016). This could be influenced by the fact that sustainability in the clothing industry may be largely attributed to the production phase and not the post-purchase phase. The fact that fashion companies promote their sustainability or have sustainable lines, such as H&M with their *Conscious* line, shows that increasing demand for sustainable products may pay off; yet the fact that entire brands are not all focused on sustainability still suggests it is still a niche market segment. Ultimately, companies' attempts may only succeed if most, if not all, consumers change their buying behaviours towards sustainable fashion.

vi. Efficiency

Cost savings is perhaps one of the most obvious drivers for eco-innovation and a study by Bossle, de Barcellos, Vieira & Sauvee (2016) concluded a more economically-efficient value chain to be the most significant driver of eco-innovation. Global resource scarcity puts pressure on companies to become more resource-efficient, and eco-innovation can allow firms to create more with less (Buhl et al; Bossle, de Barcellos, Vieira & Sauvee, 2016; Wen-Dong, Tian, Wei, & Xi, 2018).

A phenomenon known as the 'Porter Hypothesis' states that reducing pollution usually coincides with improving productivity (Tsai & Liao, 2017; Smith, 2015). Traditionally, companies saw that social progress and sustainability can only occur at the expense of economic efficiency (Porter & Kramer, 2011). However, becoming environmentally-friendly as a business does not necessarily have to occur at the expense of competitiveness; it does not necessarily add costs (Nidumolu, Prahalad, & Rangaswami, 2009)**.** Cost savings for a company can arise from more efficient organisational capabilities, and therefore competitive advantage can arise from efficiency from redesigning products.

Whilst society benefits from eco-innovation, companies bear the costs to comply with regulations and to adapt their practices to reduce their environmental effects (Hojnik & Ruzzier 2016). Therefore, often companies that partake in eco-innovation bear higher costs than their polluting competitors, suggesting that a major obstacle to eco-innovation would be implementation costs despite the positive externalities that may act as a driver. Forsman's (2013) study found that whilst eco-innovators tended to gain market-related advantages, the same firms also tended to gain efficiency-related disadvantages in the short term. This could be attributed to high initial investment costs. It is also important to note that the successful innovators all had created efficiency-related competitive advantage *before* commencing eco-innovation development and already had higher profits. This demonstrates that competitive advantage can be a result of a cumulative process that starts before innovation; a company needs certain conditions, such as efficiency and stable profitability in place first in order to succeed at gaining competitive advantage with eco-innovation. Then, eco-innovation can strengthen their market-related advantages.

vii. Internal factors

A literature review by Cillo, Petruzelli, Ardito, and Del Giudice (2019) found several authors have recognised that the effectiveness of sustainable innovation can be ascribed to internal factors, often related to the management of the development, commercialisation, and dissemination phases of new products and services.

a. Internal factor: Employee-driven eco-innovation

A smaller, less-significant but albeit omnipresent driver of eco-innovation is employee-driven initiatives, also known as 'intrapreneurship' (Buhl, Blazejewski, & Dittmer, 2016). Unlike R&D departments, employee-driven innovation stems from extra-role behaviour or outside regular work duties. This requires personal initiative as it is voluntary and exceeds organisational expectations, unless management-driven (Buhl, Blazejewski, & Dittmer, 2016).

A key factor for companies to come closer to goal of ecological sustainability is innovative solutions to wicked problems; employees have tacit knowledge with product- and market-specific knowledge, and thus internal motivations for eco-innovation within a company can help create valuable, unique, non-imitable and non-substitutional product development (Buhl, Blazejewski, & Dittmer, 2016). Employees can also be driven by their own consumer experience, or an intrinsic motivation to create consistency between home and work environmental behaviours and attitudes.

A study by Claxton & Kent (2020) which explored the sustainability of fashion through a circular economy and design management found that there was relatively low influence of designers on their firm's sustainable fashion strategy and their engagement at tactical, organisational level. They also found that sustainability strategies mostly related to sustainable fibres and manufacturing processes; materials with lower environmental impact and recycled fibres. The most widely practiced sustainable design strategies in their study addressed designing out waste and pollution as overarching goals, and all respondents to their quantitative survey claimed their businesses had policies and targets for raw materials and their impacts, perhaps because it allows for mass impact. This highlights the importance of product design as

an effective eco-innovation, especially as the fashion industry is increasingly defined by the increase numbers of products and with shorter life spans.

Most companies rely on top-down investments for innovation. Employee-driven eco-innovation can also create bottom-up processes and drive organisational development in this direction, especially when the costs of developing innovation are burdened on the company rather than the individual (Buhl, Blazejewski, & Dittmer, 2016). A key factor for success is managerial support and in Scandinavia, favourable conditions are already in place to support employee-driven environmental innovations due to low hierarchal barriers (anonymous interviewee, 2023).

b. Internal Factor: Management Style

Internally, a firm can undertake and promote environmental sustainability to attract new talent. Not only do firms need to attract customers who may drive businesses into sustainable practices; they also need to attract future employees who will choose a firm to work for, often leaning towards firms that match their own values. Within fashion, product designers are more likely to be involved where the brand ethos and identity has sustainability embedded in their design concept (Claxton & Kent, 2020).

Certain conditions of the company can drive or foster innovation as organisational culture shapes the behaviours and attitudes of individuals and provide resilience in the form of innovation strategies, processes, routines, and structures (Buhl, Blazejewski, & Dittmer, 2016). These cultural norms that are created within a company then define what is encouraged, discouraged, accepted, and rejected within an organisation (Buhl, Blazejewski, & Dittmer, 2016). Support from leaders and managers is also critical in fostering and driving innovation within a company because of their central role in defining these aspects of an organisation. An environmentally-forward leadership culture that creates eco-innovation capability in an organisation leads to good innovation strategies and entrepreneurial vision, which is critical because sustainable, long-term eco-innovation is only possible by involving many different aspects of the organisation (Bossle, de Barcellos, Vieira & Sauvee, 2016).

As long-term commitment is necessary, is it important to integrate sustainability as an explicit goal in the design process. A study by Ogrean (2018) on the Top 100 Most Sustainable Companies by Corporate Knights, an award-winning sustainable economy magazine, analysed the global ranking which is based on a method that considered 17 key performance indicators such as resource-, employee-, and financial management, clean revenue, and supplier performance. They found that internalising sustainability and transforming it into a corporate goal have determined a shift in the way companies, through strategic leadership, think about their businesses and search for success and performance; thus demonstrating that successful environmental sustainability within a firm is highly influenced by management style that shapes organisational culture and structures.

This does not occur, however, without challenges. Merely increasing the capacity and occurrence of employee-driven eco-innovation is not necessarily beneficial: employee-generated ideas may not always be worthy of management decisions and resource consumption, and ideas that do seem promising may not fit into the firm's strategic context (Buhl, Blazejewski, & Dittmer, 2016). As explored earlier, the 'triple bottom line' factors of economic prosperity and environmental and social sustainability although interdependent, are sometimes conflictual. There is a habitual overlooking or reluctance of considering external, future or other stakeholders in a firms' strategy, and it is challenging to envision a plan or overarching strategy that addresses sustainability without negatively affecting the competitiveness of the company; it is easier to play a zero-sum rather than win-win game.

Incorporation of sustainable design strategy requires that those involved are informed about the mindset and values of the company, which should be clearly communicated from management. Alignment of business culture, objectives, structures and processes is essential and teams need to be resourced to pursue a design direction with a strategic perspective (Claxton & Kent, 2020). Unfortunately, sustainability managers have referred to the challenges of incorporating sustainability in product design across industries, which needs multi-disciplinary teamwork, in terms of 'working across silos' and 'acting as a bridge' to push the agenda forward (Claxton & Kent, 2020). Under these management conditions can eco-innovation be successfully incorporated into a firm.

viii. Competition and innovation ecosystems

First-mover advantage is always temporary and is not a sustainable competitive advantage as new processes, products and designs can very quickly be imitated; particularly where there is shift in policy or market pull that needs to be adapted to (Ghemewat, 1986; Grant, 2021). For example, Nike discovered that manufacturing their products with far east labour allowed the company to grow to three times larger than the next largest shoe manufacturer. Reebok quickly copied this strategy, then additionally endorsed athletes and rock stars to promote their shoes which multiplied its profits five times. Similarly, Boston Consulting Group was the first management consulting firm until many spin-offs started (Ghemawat, 1986). This is also an example of Stackelberg competition, where one player, a market leader, moves first and all others move after (Hafezi & Zolfagharinia, 2018). Therefore, this raises the question as to *which* advantages tend to be sustainable and why; according to Grant (2022), competitive advantage that arises from external change also depends on firm's ability to respond to change. This entrepreneurial responsiveness comes from the exploitation of anticipation and agility, where if successful, creates competitive advantage.

Similarly, firms within an industry, although competing, can consequentially end up in innovation ecosystems which are defined by Oksanen and Hautamäki (2015) as dynamic, interactive networks that breed innovation. In practice, this can be seen through local hubs, global networks, industry and business clusters, or tech platforms (Oksanen & Hautamäki, 2015). Cooperation can also occur as a driver of innovation; where there is interdependency between firms, customers, distributors, suppliers, or universities, the likelihood of innovation is improved (Buhl, Blazejewski, & Dittmer 2016).

ix. Certifications & company reputation

Companies should invest in activities that reduce their environmental impact, as a means of building a competitive advantage through improved corporate reputation; ideally through strategic assets that competitors cannot replicate.

One such asset is environmental certifications. Certifications of environmental sustainability could be a major driver of eco-innovation for fashion firms. Research carried out by consulting firm 10 Sustainability shows that including Corporate Social Responsibility (CSR) in business strategy can increase sales by 20 per cent and productivity by 13 per cent (Aldana Marin, 2022). Therefore, it can be financially rewarding to use certifications to demonstrate CSR.

Certifications are particularly relevant to the fashion industry because they play a role in company reputation and legitimacy which is important for consumers in making consumption decisions as well as in attracting investors who can help further support eco-innovation. Additionally, certifications help to establish industry standards which further encourages economies of scope and first-mover advantages, potentially creating barriers to entry or to compete to the firms' advantage; and companies that are not structurally prepared to adapt rapidly may be hindered (De Miguel De Blas, 2020).

Studies by Hojnik & Ruzzier (2016) and Buhl, Blazejewski, and Dittmer (2016), however, found that only certification ISO14001 affected eco-innovation significantly. This certification represents that the companies that comply have effective environmental management systems, meaning that external stakeholders can be assured that environmental impact from the companies' operations is being measured and improved (ISO, 2023).

Other widely recognised certification labels in the fashion industries in Sweden and Denmark are the EU Ecolabel and Oeko-Tex. The EU Ecolabel has a complex accreditation criteria that when complied with, guarantees sustainable fibre production, strict restrictions on the use of hazardous substances, and a longer-lasting final product (EU Commission, 2014). Oeko-Tex is global and requires every thread, button, and other textile features within a garment has been tested for harmful substances to human health, including testing for other regulated and non-regulated substances (Oeko-Tex, 2023).

Globally, 'Climate Neutral Certified' and the Global Organic Textile Standard (GOTS) are widely recognised throughout the fashion industry. *Climate Neutral Certified* is used by brands such as US-based Reformation and focuses mainly on emissions, measuring energy use, raw materials extraction, shipping, and more factors in the final product using a peer-review system (Climate Neutral, 2023). GOTS perhaps focuses on the widest selection of criteria such as the

ecological farming of materials, limitations on harmful chemicals and pesticides, and packaging materials (GOTS, 2023).

Whilst companies evidently should invest in activities that reduce their environmental impact, especially as a means of building competitive advantage through improved corporate reputation, companies should pursue corporate reputation carefully (De Miguel De Blas, 2020). A study by De Miguel De Blas in 514 publicly listed companies in the US across all industries investigated the link of reputation on the firms' performances related to environmental action and achieving this through advertising. The study found that when a firm invests in environmental policy, less advertising was actually *more* effective in portraying a strong environmental reputation. This was also valid vice versa; more advertising limited a firms' environmental reputation. Authors of the study attributed this to customers perceiving untruthful motives through advertising and scepticism when a firm over-advertised its environmental policies (De Miguel De Blas, 2020).

This highlights the importance of corporate transparency to the sustainability of business and to capitalising on a market that prioritises environmental sustainability. Evidently, it correlates to trust. In fact, 89 per cent say that would re-trust a business if it is completely transparent about a mistake (Nguyen, 2023); thus a company that is transparent benefits from improved relationships with customers. Where companies provide widely recognised green labelling it provides meaning and legitimacy to its claims about its products, which helps to avoid perceptions of greenwashing as well as help customers make informed decisions (Brico & Jensen, 2016).

x. Risk

Drivers of eco-innovation or innovation in general should not be considered without their risks. Innovation is a highly risky process; hence in an uncertain and complex environment, innovation outcomes are uncertain (Wen-Dong, Tian, Wei & Xi, 2018; Grant, 2022). Such uncertainties can include but are not limited to: uncertainties about the direction and future of markets, whether a new business model or strategy will be sustainable, future policy directions and implications, new technologies, and industry directions (Wen-Dong, Tian, Wei & Xi,

2018; Grant, 2022). In relation to market demand, forecasting demand for a new product tends to rely on analogies or past data, which can be inaccurate representation of the actual size and growth rates of markets (Grant, 2022). Furthermore, the 'success' or 'failure' of a particular innovation strategy can depend on opinion or interpretation; depending how success is measured. For example, the success of an eco-innovation could be measured as to a firm's internal goals, industry goals, societal expectations, or policy requirements. Furthermore, De Miguel De Blas (2020) notes that often sustainable innovations are not viable in the short-term financially but instead in the long-term, which makes results difficult to measure.

Firms are also naturally inclined towards status-quo bias in the form of conservative companies and consumers who do not want to change their habits. Tsai and Liao (2017) note that there are implications of adopting new eco-innovations that companies may wish to avoid or deter because of initial investment, economies of scale or scope, and the waste or recycling of products that consequentially become obsolete.

However, given the nature and speed of rapidly developing market and policy interest in the link between environmental sustainability and consumption, risk factors should be weighed against the risk of *not* partaking in innovation and product development.

xi. Chapter Summary

Research by the Nordic Council of Ministers (2019), Stål and Jansson (2017), Brico and Jensen (2016) and Thøgersen and Ölander (2002) show a strong interest of consumers in Sweden and Denmark, particularly youth, in making environmentally-conscious consumer decision to support and proactively have a sustainable lifestyle; yet at the same time they are finding it hard to do so.

It is also evident that there is a strong financial incentive and potential increased competitive market position that rewards investments in eco-innovation, without undertaking too much risk and promoting themselves doing so. Studies by Bossle, de Barcellos, Vieira and Sauvee (2016) and Forsman (2013) have shown that the adoption of eco-innovation has a positive effect on company performance. Eco-innovations that promote environmentally-sustainable

consumption patterns can allow a firm to compete with a differentiated position in their industry, and sustainability can be ingrained in design ethos and company values through management and employees.

Statistics show that current consumption patterns within fashion are unsustainable and an industry revolution must happen to address this in order for current consumption trends and for firms to continue to profit and succeed and grow within the fashion industry. Although studies in the literature review show that the main drivers for eco-innovation and environmentally-sustainable product design are policies and regulations, market pull, value chain efficiency, internal factors, competition, and certifications; it is unclear which exact drivers are the most relevant to fashion firms in Sweden and Denmark.

3. The Study

This study will investigate the major drivers of eco-innovation and identify the key motivations for innovation that fashion companies originating and operating in Sweden and Denmark face in regards to transforming their product offerings towards more environmentally-sustainable designs through eco-innovative methods. I will investigate the general drivers of eco-innovation and more environmentally-sustainable product design to the fashion industry in Sweden and Denmark.

i. Research Purpose

This study explores the drivers that influence fashion firms in Sweden and Denmark to adopt eco-innovative practices and develop more environmentally-sustainable product designs. This will provide a valuable understanding to the fashion industry, to other industries in Sweden and Denmark, and to the fashion industries in other countries and regions of the motivations and strategies that shape eco-innovations and environmentally-sustainable product development.

Firms can use this information to examine the role of initiatives, governmental policies, and market demands and other internal and external factors in driving eco-innovation in Sweden and Denmark. The study should highlight the importance and advantages of taking these factors into consideration and undertaking eco-innovation and more environmentally-sustainable product development in their firms. This can be particularly valuable and insightful for firms for their strategy development.

ii. Methodology

a. Research Design

For the data collection, I took a qualitative approach, combining the literature review with small case studies and supplementary semi-structured interviews. The literature review provided an overview of previous research conducted in various industries, including fashion, on different types of eco-innovation drivers, as well as studies that highlight the growing interest of sustainable consumption and environmental consequences of increasing consumption, even in the fashion industry. The primary means, however, of collecting data in this study was through qualitative interviews, interviews conducted by other authors, and conference talks.

The interviews were deliberately undertaken as a form of social interaction with a dynamic, meaning-making approach where knowledge is produced by the interviewee "in collaboration with an equally active interviewer" (Holstein & Gubrium, 1995). The semi-structured interviews were conducted focusing on the companies' internal and external environments. I aimed for more of a discussion than a question-and-answer interview, and questioned the motives for eco-innovative initiatives as well as any sustainability pressures the company faces. I asked questions such as: *what is the role of environmental sustainability within the company and product designs; what are the main motivations for incorporating environmental thinking; how have your specific eco-innovations been received by customers;* and *how do you stay up-to-date with developments in policy, regulations, certifications, and the market?*

In addition to my own interviews, I gathered data from interviews conducted by other authors as well as conference presentations that have been recorded. As I was unable to interview a highly relevant individual within sustainability, product development, and/or business development in several of the companies studied, the interviews and conference presentations meant I was able to analyse them being interviewed or present on the topics of eco-innovation and environmentally sustainable product development within the past maximum four years. Whilst this did not allow for my specific interview questions to be answered thus strengthening consistency and reliability, the conference talks did provide a more diverse set of topics that were discussed and presented, allowing for more comprehensive content compared to what the time restraint on the interviews I conducted allowed for.

The method of interviewing and listening to discussions on the topics of eco-innovation and environmentally-sustainable product development was the most appropriate method of data collection for this study as I intended to investigate and explore what the drivers are, and then determine their influence and significance based on how the companies discussed them. From the data collection, I then categorised the drivers identified into key findings.

The research question was:

What are the drivers are of eco-innovation and sustainable product development?

Because of resource limitations such as time from both my side and the companies' side, I studied small- to medium-sized enterprises (SMEs). I categorised 'small' as less than 100 employees and 'medium' as 101 employees or more. All of the companies were operating in markets outside Sweden and Denmark, which is significant because they are sensitive to external conditions outside of Sweden and Denmark. For this study, however, I focus on Swedish, Danish and EU external conditions to limit the scope of the study and make it feasible since a study on the external conditions outside of this focus area is beyond the capacity of the study's resource limitations. One consequence of using this scope is the risk of forfeiting the right to claim that the drivers that are found as a result of the study can be generalised to the fashion industry as a whole; both in terms of small to large enterprises and for the Scandinavian, European, or global fashion industries. The purpose of studying Swedish and Danish firms is to study them as forerunners in eco-innovation and environmental sustainability (Golay, 2022; anonymous interviewee, 2023; Ogrean, 2018).

b. Definition of scope

The study is primarily concerned 'fashion' as a product; considerations of fashion as a service is beyond the scope of this study. Thus eco-innovative services that were common amongst these brands, such as rental and repair services, are not considered.

As previously mentioned, the scope of eco-innovation is limited to motivations for environmental sustainability, although pursuit of environmental sustainability may also incur positive effects on social and economic sustainability. Economic sustainability is not the same as sustainability of the business, such as sustainable competitive advantage.

c. Validity

As the interviewer, I avoided asking about specific drivers initially, so as not to promote bias and instead receive the most accurate responses. To ensure high validity, the interviews were conducted with open questions to allow the respondents to describe the most important drivers and obstacles without suggestions from my side in order to evade possible cognitive biases that suggestions can create in shaping the answers.

The validity of pre-conducted interviews and conference presentations as a data collection method is high as I was able to collect data from individuals with a lot of influence in the field that I was not able to access for an interview. Further, they were recent, with the earliest presentation used in this study being in 2019.

Since I only studied SMEs and across two countries, the validity of the findings of this study beyond the specific sample set and to the wider industry on a global level is limited and can instead be seen as a demonstration of the potential for eco-innovation and more environmentally-sustainable product design to occur from drivers and catalysts.

d. Reliability

Although I did not record the meetings, I took notes during the interviews based on my interpretations during the conversations. This allowed me to fully engage in the discussion and focus on understanding their motivations, and ask follow-up questions, especially relating to their particular innovations within the firm. Although this discussion method of interviewing decreases systematic mistakes, it has a lower reliability since I did not ask consistent set of questions in the same way to each interviewee. To mitigate this, I asked questions such as ‘what are the motivations…’ and ‘what is the role of…’ when seeking out drivers for eco-innovations and sustainable product designs. Another deficiency in reliability is that I interviewed different positions in different companies; I interviewed individuals within product development and business development, which are two separate functions of the firms and therefore may have different goals and priorities in terms of the role of sustainability in the company. For example, whilst the business development manager at one firm emphasised the importance of the wider

economy on influencing market demand for more sustainable products, a product development manager at another firm discussed increased sustainability as an externality of their product design and could not comment on the firm's economic advantages on undertaking eco-innovation as it was beyond their tacit knowledge. However, as Grant (2023) notes, all features of an organisation are complementary and sustainability was a core value of all the companies studied so to a large extent their priorities would be similarly aligned.

The conference presentations were recorded directly via video ensuring high reliability, especially compared to only having my own notes from the interview method. Additionally, as the conference talks are subject to a wider, potentially well-informed audience as opposed to one-on-one interviews, the information they communicate is potentially subject to more scrutiny meaning the data collection is highly reputable.

e. Ethical considerations

Participants were informed about the research purpose of the study. All interviewees were also informed that although I would use the company, position, and department titles, I would not use their personal names. This is due to privacy reasons and that it would not add any value to the study or discussion, as it is not considered relevant.

iv. Selecting case study companies

Scandinavian countries have a reputation to be leaders in sustainability and transparency (Golay, 2022). Notably, Sweden was in the top 10 most represented countries in the Top 100 Sustainable Companies List by Corporate Knights, with 5 companies listed and Denmark with 3 (Ogrean, 2018). Although the business strategies of firms are influenced by the institutional context of their country of origin both legally and informally, both Sweden and Denmark have similar markets, and the brands studied have similar market penetration in both countries and similar customer preferences (anonymous interviewee, 2023).

For the purpose of this study, I consider SMEs in the Swedish and Danish fashion markets. All companies are present and operating in both markets. The particular firms in this study were

chosen due to the consistent prominence of environmentally-sustainable products in their seasonal product offerings as well as having undertaken eco-innovations in their product design.

a. Samsøe Samsøe

Samsøe Samsøe is a Danish clothing brand, producing womenswear, menswear and accessories with a minimalist, somewhat 'classic' Nordic style and an emphasis on quality and materials. Headquartered in Copenhagen's Nørrebro district, Samsøe Samsøe has today over 40 stores throughout Europe and over 500 retail spaces, sold in 31 countries in total (Samsøe Samsøe n.d.c). The brand was founded in 1993 by the two Samsøe brothers, and in 2000, the company was taken over by two individuals who transformed the brand into an international fashion house of which today is 60% womenswear and 40% menswear (anonymous interviewee, 2023). Still a private company, Samsøe Samsøe recorded an annual revenue of USD 149 million in 2021, with 230 employees (Samsøe Samsøe, n.d.c).

As mentioned in chapter 2.i.c, Samsøe Samsøe released a line made from wool sourced locally and more recently started to attach resell labels on their garments (see Figure 1). Additionally, the company is introducing a product passport not only to comply with potential EU regulations but also to allow for traceability for their consumers as far back and detailed as possible. I interviewed the Chief Business Development Officer at Samsøe Samsøe in their Copenhagen office, who is responsible for exploring, negotiating, introducing, and implementing a variety of eco-innovations into the business operations at the company.

b. Ganni

Ganni was founded in 2000 as a cashmere line, before being taken over in 2009 by a husband-and-wife team as Creative Director and CEO respectively (Crump & Kent, 2019). As of 2023, the company has 50 stores (Ganni, n.d.e) and in 2021 reported a global net sales of US129,8million (Grant Thornton, 2021). On the company website, Ganni boldly states: 'we're not a sustainable brand' (Ganni, n.d.e). Their official motto, as seen in the title of their website, is "intended to outlast trends" (Ganni, n.d.e) and the brand identifies itself, and is known for, its focus on sustainable fashion (Crump & Kent, 2019), with the brand's primary mission as

'responsibility' (Ganni 2023, n.d.d; Bartley 2023). In 2022, they spent 1.1% of their annual revenue on responsibility (Ganni, 2022d). In the same year, the company became B Corp certified, attaining the highest score of any contemporary fashion brand at the time (Ganni, 2022e).

Several of their eco-innovations for their products include, but is not limited to, provision of information such as optimal washing and drying conditions and 100% traceability (Ganni, n.d.e), as well as more responsible designs such as textile innovations discussed in chapter 2.i.c. For this study, I collected data from analysing a conference presentation by Sustainability & CSR Director Lauren Bartley given in May 2023.

c. Nudie Jeans Co

Nudie Jeans Co was founded in 2001 in Gothenburg, Sweden, and has a *wear, tear, repair* philosophy for their products: jeans (Nudie Jeans 2022a). In 2022, sales amounted to US46,5million. The brand is currently present in 50 markets and is both GOTS and ISO14001 certified (Nudie Jeans 2022a). The company has an extensive range of external policies that determine restrictions on certain harmful activities such as chemical usage, climate, materials, sourcing, and transparency (Nudie Jeans 2022a). For this study, I analysed two interviews undertaken with Sandya Lang, Sustainability Manager at the company.

Nudie Jeans Co claim that all of their jeans are made with 100 per cent organic and fair-trade cotton (Nudie Jeans, n.d.). In 2018, they replaced the leather patches on their jeans to a substitute made from paper (Nudie Jeans, n.d.). To maximise the product lifecycle as much as possible, Nudie Jeans offers free product repairs in their stores, repair kits for consumers, as well as free product maintenance advice, including washing instructions: in 2022, they repaired 65 386 pairs of their jeans for their customers globally. Directions on how to break-in their jeans is published on their website, social media and through booklets that come with purchase that recommends a process whereby the user wears them for at least six months without washing them, thereby moulding the denim to the user like a second skin which is central to their brand identity. In this way, their design ethos consequentially creates lesser environmental impact through minimising washing and ensuring longer product use through a correct fit.

d. Filippa K

Filippa K, headquartered in Stockholm and operating in nine countries, was founded in 1993 and today has 227 employees (Filippa K, 2022). The brand is known for its minimal, high quality and well-made garments that are versatile and classic in style. Filippa K is also a pioneer in the prioritisation of sustainable materials: in their sustainability report, they claimed 78% of polyester was recycled and 75% viscose was certified, yet for polyamide 86% was non-recycled (Filippa K, 2022).

The brand declares a design philosophy emphasising classic styles rather than contemporary trends that are designed to be timeless and to be used season after season (Filippa K, 2022). They sell an organic washing detergent and fabric softener that maintains textile quality thus prolonging the lifespan of their garments whilst also lowering the environmental impact in the consumption phase of the products lifecycle.

The company has also experimented with recycling their own waste. An upstream innovation in 2022 saw 1 507kg of wool cutting scraps from their production in Portugal sent to another of their production facilities in Italy, where the wool scraps were mixed with recycled polyamide and produced into a textile that will be used in the Autumn/Winter 2023 collection (Filippa K, 2022).

For this study, I analysed interviews with Elin Larsson, former Sustainability Director who was with the company for over 20 years; Creative Director Liisa Kessler, who was the first to take over from the original company founder, Filippa Knutsson, in this position; and Mikael Björklund, Chief Operating Officer.

e. Son of a Tailor

Son of a Tailor is a Copenhagen-based, made-to-order custom-fitted clothing company. It is the only non-ready-to-wear fashion company in this study. It was founded in 2014 and today has served over 150 000 customers (Son of a Tailor, n.d.). They call themselves a clothing-technology company with the 3 principles: producing exactly to demand, perfect custom fits, and exclusively using high-quality materials that last (Son of a Tailor n.d.). In 2022, the

company also became B Corp certified. For the study, I interviewed the Product Development & Quality Control Lead Fatima Sandoval.

Although it began with in-person fitting, now the company has a calculator where customers put in height, weight, age, and shoe size data that creates an individual pattern that producers within Europe automatically receive and start producing, and send the final garment(s) to the customer directly (Son of a Tailor, n.d.). This reduces waste and emissions from overproduction and therefore also reduces the impacts of chemicals, distribution, and water usage from both production and from suppliers. The use of high quality and more sustainable materials, such as Tencel™, means the garments last longer; and since they focus on basics such as t-shirts, shirts, and polos the products are less trend-driven and instead more versatile. Environmental benefits are also realised from the direct-to-consumer business model, as warehousing and distribution is limited. Finally, they provide detailed care instructions for each product, depending on the materials, to maximise the lifespan of each product.

f. Categorisation

The companies have been categorised based on their number of employees and annual revenue in either 2021 or 2022, taken from their annual reports.

Table 3: Companies and their (number of employees, annual revenue in either 2021 or 2022)

Small	**Medium**
Son of a Tailor (46, 6m)	Filippa K (200, 84,4m)
	Nudie Jeans Co (213, 23,5m)
	Ganni (386, 129,8m)
	Samsøe Samsøe (552, 149m)

v. Limitations

The research may be limited by the availability of data and the extent of the willingness of companies to participate in the study which was mitigated by using previous interviews and presentations as a data collection method. Additionally, the research may be limited by the subjective nature of some of the data collected through the semi-structured interviews. All of the companies except for Son of a Tailor have a separate sustainability department or employees, who may have different objectives, goals, incentives, and outlooks on eco-innovation drivers and sustainability within the company in general compared to their counterparts in, for example, business development or operations.

Another limitation is the small sample size and overrepresentation of medium-sized firms (see Table 2). Due to the limited resources, it was not possible to explore a wider range of companies and undertake more interviews which may have provided a more comprehensive dataset that could potentially more accurately reflect the fashion industry as a whole.

4. Discussion

i. Chapter outline

The study aims to identify the key drivers of eco-innovation and sustainable product development in fashion firms in Sweden and Denmark, using a qualitative approach with interviews and conference presentations as the methods of data collection. The key drivers identified are the inner vision or founding values of the company, internal policies, and product differentiation motivations.

The chapter begins with a summary of common themes that were found as a result of the study, especially in relation to the theoretical background, as they were often aligned; many of the drivers in the literature review were also recognised in this study. Following this, the three key findings are introduced and discussed in detail, with data from the case study companies synthesised and analysed together. Finally, it will conclude with recommendations to other firms and stakeholders and suggest areas for future research.

ii. Main themes & patterns identified from data collection

Aside from the three main drivers that were found as a result of the study, there were also several common themes identified from the data collection of company experience. One such underlying theme was transparency; which was commonly discussed as detailed and accurate information about operations along the supply chain, such as being aware of where all products come from, production methods, transport routes, and environmental impacts as a result of these. This could be linked to Key Finding 1: Sustainability is a core identity of the company and its brand and also to certification requirements, although none of the companies explicitly mentioned this. Transparency was also particularly relevant to this study because it is generally easier for SMEs to have an awareness of where all their products are coming from (anonymous interviewee, 2023). One anonymous interviewee also explained that the company pursued transparency to demonstrate to other brands in the industry that this is beneficial and rewarding; in a ‘shared value’ approach, they want to help establish industry standards of doing so. However, due to transparency being more relevant to the supply chain of fashion firms, it is

deemed beyond the scope of the study and was not further investigated as it would not be relevant to the findings of this study.

Another significant factor that was mentioned by three of the companies was the influence of local culture. In Scandinavia, it is more relevant to incorporate environmental sustainability in product designs than, for example, in one of the interviewees' home countries of Spain. One interviewee stated that the company does not necessarily advertise or promote themselves as sustainable; instead, they undertake eco-innovation and environmentally-sustainable product design more because it is seen as a standard. Nudie Jeans Co operate under the assumption that since there is a growing increase in consumer awareness regarding sustainability, today's consumers expect brands to be sustainable (Lang, n.d.). Additionally, the founder of Filippa K, Filippa Knutsson, stated: "being aware of how we impact the environment is embedded in Scandinavians" (Larsson, n.d.).

Significantly, a good economy usually corresponds to customers willing to spend more for more sustainable products, which drives companies to then attempt to meet this need (anonymous interviewee, 2023). Interestingly, the demand for both more environmentally-sustainable products and new, innovative products is experienced to be highly elastic and customers tend to buy more sustainable products when the economy is strong (anonymous interviewee, 2023). A manager within business development noted that demand for more environmentally-sustainable products decreases when general prices increase, and house prices act as a good indicator of consumers' willingness to try new products. Therefore, environmental sustainability was not a priority for the company from a business development perspective. This supports and reinforces the risk of eco-innovation, as discussed in chapter 2.x, where not only consumer demand is uncertain, but also the wider economy is volatile and cannot be predicted accurately in order to forecast demand and response to innovative products.

Another common theme from the data collection was that although the firms all had some form of sustainability at the core identity and inner vision of the company from the very beginning, it was acknowledged that big ambitions in terms of eco-innovation and environmental sustainability were not necessarily feasible as they require structural change that may not be realistic; it is easier to start from scratch than to adjust (anonymous interviewee, 2023; Larsson, 2019). Smith (2015) describes that it may be difficult for already-established firms to change entirely, therefore it is more popular to modify or re-design business activities to meet

priorities. This was reinstated by Samsøe Samsøe, which claimed that once you reach a certain volume, including regions, suppliers, supply chain, or economies of scope and/or scale, environmental sustainability naturally remains largely in the peripheral (anonymous interviewee, 2023). Son of a Tailor stated that although their business was found upon the idea that fashion is not sustainable and the founder wanted to make a difference and contribute to 'fix' the industry, environmental sustainability is only an externality for the consumers and it is not the main reason they choose to purchase from them (anonymous interviewee, 2023). At the same time, however, firms should also convince the *consumers* to change their behaviour, to *want* the products that are more environmentally sustainable; especially in regards to eco-innovation where firms need to create a demand for the innovative product (Larsson, 2019).

An interview with Filippa K strongly recommended that firms must be adaptable to change, which is supported by the comments from Samsøe Samsøe that reaching a certain volume limits the capacity to prioritise environmental sustainability. The interviewee from Filippa K claimed that in order for firms to be adaptable to change, they must ensure: knowledge of sustainability that is relevant to the company and its operations is available which then creates engagement both internally and external to the firm; a fully-integrated vision and clear direction in terms of environmentally-sustainable direction and focus; the company must be bold enough to be able to pursue eco-innovations; and they must also be humble enough to adjust their strategy or designs along the way (Larsson, n.d.). This finding also provides usefulness to other firms in the fashion industry, or firms in any industry that would like to pursue more environmentally-sustainable product development, who can integrate these capabilities into their firm.

Although certifications did not seem to be a key driver for eco-innovation from the study, the data collection showed that they can influence environmentally-sustainable product design. For example, certifications influence the activities of firms who would like to be certified by setting standards for the suppliers of the materials they use and reducing the number of factories or requiring them to meet certain requirements. However, since this is relevant to the supply chain and production processes, it is beyond the scope of this study and was not explored on a deeper level than this. Son of a Tailor has much influence on its business strategy from its certifications; for example, they are B Corp certified, which means that in order to maintain these, they need to continuously adapt to the raising standards of the certification; for example, demanding that factories use solar power. In this way, certifications can act as frameworks for environmental sustainable business strategy. Additionally, since all of their fabrics are Oeko-

Tex, and their internal policy is that all the wool they use should be non-mulesed, these certifications are more relevant to product differentiation and to internal policy since the fundamental purpose of using these specific fabrics is to be more durable, with the added benefit that they are more environmentally sustainable options (anonymous interviewee, 2023). Nudie Jeans Co also claimed that certifications demanded they constantly improve their product design towards more environmentally-sustainable offerings (Lang, 2021).

Whilst none of the firms except for Samsøe Samsøe discussed the influence of regulations in detail on their pursuit of eco-innovation and more environmentally-sustainable product designs, Nudie Jeans Co described that Swedish textile responsibility legislation was influential on a structural, industrial level rather than on individual brands. Further, they are a member in an industry organisation in Sweden which also involved other small, medium, and even large fashion firms to ensure that firms align their strategies and CO2 reduction goals, which would again play a role in establishing industry standards (Lang, 2021).

iii. Key Findings: Identification of Major Drivers

Key Finding 1: Sustainability is a core identity of the company and its brand, its 'inner vision,' which drives eco-innovation and environmentally-sustainable product development

For Samsøe Samsøe, Ganni, Son of a Tailor, and Nudie Jeans Co, I observed that the sustainability 'journey' started with the owner's vision for the identity of the brand; for sustainability to be "part of the DNA" and that designers should "push for it" (anonymous interviewee, 2023). For example, Nudie Jeans Co founder, Marie Erixon Levin, stated: "when we started Nudie Jeans … we decided that environmental awareness … would permeate everything we did" (Lang, 2021). Filippa K even goes as far as to set internal policy on an increasing number of sustainable materials incorporated in product designs each season (Thomson, 2018).

Whilst it could be argued that this could also be interpreted as product differentiation, these early ideas and decisions of the company's business model clearly go beyond just the product and permeate all aspects of the business model and all potential innovations. It also could be explained from this that these brands are intrinsically destined to produce slow fashion, since

the concept of a longer lifecycle of fashion products must transcend seasonal trends by default. Although this was a common finding for all firms in the study, it may not be relevant to larger firms and therefore the results of the study may not be able to reflect the fashion industry as a whole.

For Son of a Tailor, the founder had a professional background in e-commerce and in industrial engineering, where he found that firms' inventories produced significant CO_2 footprints. Therefore, his philosophy for starting the brand Son of a Tailor was to offer the *product* of a personally-tailored, lean or just-in-time (JIT) version of an item (the t-shirt) that was invented to be a mass-production item (anonymous interviewee, 2023). In the interview, when asked what the motivations were for incorporating environmental thinking in sustainable product design and in eco-innovations, they see the most significant issue in dead stock, that is going to landfill and/or burned. To guarantee the long life they want their products to have in their consumers' possession, they tailor-make the garments according to the customers' measurements and use durable, high-quality mono-, or single, fibres that are easier to recycle. The higher quality fibres even allow for stronger colour fastening, which further supports a longer lifespan of the product due to a higher resistance to fading. Furthermore, the fibres undergo rigorous testing to test the fibre length to breaking point to ensure the highest quality of the materials used. To align the founder's vision with the company's product strategy, they identify themselves as more of a tech company than a fashion company (anonymous interviewee, 2023).

Nudie Jeans Co is still privately owned by the founders of the brand, which enables them to maintain the company's original purpose of producing more sustainable products. Employees across both business development and product development can prioritise according to the identity of the brand without needing permissions or prioritising investors or owners that may not prioritise sustainability in the same way, since their core values determine how they do business because of the prevalence of their foundational brand identity (Land, 2021). Whilst Samsøe Samsøe still followed the vision of the founders to incorporate sustainability into the brand, the company has since been sold and although it is still privately owned, this does not necessarily guarantee their adherence to the original founders' wishes. Similarly, Filippa K has owners that are not the original founders of the brand. However, the two owners highly value sustainability which is critical to enabling Filippa K to pursue environmentally-sustainable innovations and product design even where there may be risk in doing so.

Filippa K's original philosophy from the founder, Filippa Knutsson, was to create simple, long-lasting products that offer style over trend, which is more seasonal-based. One way they do this is by focusing on the similarities of consumers rather than the differences. Although their mission was not explicitly to target value-based consumption, the company aims to offer clothes that last a long time, both quality- and style-wise (Todorova, 2018). In this way, by adhering to this vision to this day, sustainability remains a core identity of the brand which drives eco-innovation and the pursuit of environmentally-sustainable product designs. Two notable examples from Filippa K's 2018 collections include the 'Eternal Trench Coat,' which is made from 100 per cent recycled materials and is 100 per cent recyclable; and the 'Throwaway Dress' which is made of 100 per cent bio-based material and is 100 per cent compostable (Larsson, n.d.).

For Ganni, the brand's philosophy from the founders was 'responsibility' which largely refers to sustainability, claiming it to be a 'state of mind' rather than a form of dressing (Bartley, 2023; Ganni, 2022d). By this, the brand intends to be as responsible as they can possibly be, and have the philosophy that it is their responsibility to inform and educate their customers and their own employees about sustainability as they know it. Whilst this is closely related to internal policy, since environmental sustainability and experimenting with new sustainable materials is a key aspect of the company's image and brand reputation the founders have built, this remains a key driver for pursuing eco-innovation and environmentally-sustainable product design.

In an industry with differentiated products, according to Grant (2022), firms rely on the advantages of brand recognition, awareness, and customer loyalty. This means it is very important for companies to have a strong identity that is consistent, reliable, and lasts over time. As mentioned in Chapter 2.vii.b, incorporation of sustainable product design as a strategy requires all those involved to be aligned on the mindset and values of the company (Claxton & Kent). Ultimately, the most significant key driver of eco-innovation and environmentally-sustainable product development for the firms in the study was the brand ethos and vision of the founders of the brand that is maintained today.

Key Finding 2: Internal policies act as a driver for eco-innovation and environmentally-sustainable product design

Several firms in the study followed through with ideas and designs that were innovative and/or more environmentally-sustainable because of pre-established internal policies.

Ganni is a pioneer in using internal policy as a driver for pursuing higher levels of environmental sustainability. Firstly, they have a policy to publish every goal, and report on the progress of these goals to satisfy these policies. When they plan on developing an idea, they mention it publicly so that they are held accountable to go through with it. These publicly-stated ambitions act to hold themselves accountable, therefore enforcing a commitment to their vision, whilst also allowing them to promote the work they are doing without being criticised for greenwashing (Bartley, 2023).

Filippa K has three significant internal policies that drive strategy. The first of these is their own 4R policy: reduce, repair, reuse, recycle; this provides a framework that drive their product design in that they should reduce excess consumption, repair instead of throwing away, reuse for different functions or purposes, and be as recyclable as possible (Todorova, 2018; Thomson, 2018; Larsson, n.d.). The release of each seasonal collection must contain 'Front Runners,' which are products that are made as sustainable as possible. This is a learning process for the company as by 2030, their commitment is that all their products will be 'Front Runners' (Larsson, n.d.). Lastly, they have publicly announced five commitments to reach for 2030:

(1) Only working with sustainable materials for product design, and all styles should be recyclable;
(2) Products produced in a sustainable way, with traceability and transparency evident throughout supply chain;
(3) Resource efficiency: produce only what is needed and purchase the right amount of material to do so;
(4) All people working with Filippa K products should have fair working conditions;
(5) Long-term success through long-term relationships and having profit to invest in the organic growth of the company.

Commitments (1), (2), and (5) are directly linked to, and drive, eco-innovation. Commitments (1), (2), and (3) relate to pursuing environmentally-sustainable product design (Thomson, 2018).

Nudie Jeans Co has a unique approach in which the Sustainability Manager 'audits' the company from a sustainability perspective and addresses the results of the investigation (Lang, 2021). By introducing this role and this function, the company is setting an internal policy of self-regulation and ensuring they are representing their own brand image as effectively as possible. Similarly, Ganni has an external Responsibility Board that 'audits' the company to keep them accountable and ensure sustainability perspectives are represented in decision-making that are not tied to financial, or other, performance (Ganni, 2022d).

By establishing internal policies that require companies to pursue environmental sustainability in their product designs, they pre-emptively ensure that the company upholds its goals and resultantly remains agile in adapting to future directions in market pull, policies, regulations, and industry competition. This closely relates to internal factor of management style mentioned in chapter 2.vii.b, which helps to facilitate these internal policies and the implications they have.

Key finding 3: Developing a unique product differentiation acts as a driver for eco-innovation and environmentally-sustainable product design

Experimenting with environmentally-sustainability innovations opens up new strategies for promoting the brand and growing the company, thus the pursuit of product differentiation is a key driver for eco-innovation and more environmentally-sustainable product designs.

As consumers are generally setting higher standards and becoming more and more aware of environmental concerns relating to fashion consumption, a unique opportunity to exploit this niche yet developing market arises. Whilst the product designs can follow the same criteria and standards as regular collections, added sustainable 'features' such as minimised waste, recyclability, an extended lifespan which also allow for resale, or a resale tag as discussed in

Chapter 3.iv.a and seen in Figure 1 add a unique selling point and potentially increased value to the environmentally-conscious consumer.

Companies that emphasised sustainable materials for durability can be judged as adding the value of quality to their products. Samsøe Samsøe has taken a first move in complementing the quality of their products with resale tags, allowing customers to conveniently and sustainably 'dispose' of their product when they are finished with it by giving it a new life that is facilitated by the company itself. Although this is expensive to begin with, eventually long-lasting products will be an industry-wide requirement and garments will have a resell value over time, like a car (anonymous interviewee, 2023).

Product differentiation also opens up strategies for promoting the brand; for example, to the upcoming younger generation. One interviewee responded that instead of finding influencers to promote the products, as is a common strategy today, they instead should find a different 'voice' that corresponds to market direction and consumer expectations (anonymous interviewee, 2023).

Ganni's 'Fabrics of the Future' program, in which they collaborate and experiment with new, innovative materials in their collections, is a pursuit of becoming a market leader for responsible materials to gain benefits in competition and in market position. To stay ahead, they also think about what comes next when incorporating an eco-innovation or sustainable product design; for example, if they switch to an organic cotton for a collection, they also need to think what will come next after organic cotton, as there are ongoing developments and eco-innovations that occur in the fashion industry and sub-industries constantly (Bartley, 2023). This is also because fashion works a year ahead (Bartley, 2023). This is necessary to mitigate knowledge diffusion: as customers become increasingly familiar with attributes of new, more environmentally-sustainable product designs and attributes such as new materials used, they become better able to judge value for money and become more demanding and price sensitive (Grant, 2023). This reinforces the need for differentiation through marketing, branding, reputation, functionality, or other unique selling points.

Since alternative innovative materials are three times more expensive than conventional materials (Bartley, 2023), product differentiation is necessary if the company will undertake eco-innovation, whether because of internal policy, company vision, or to create a unique

selling point. Ganni absorbs the extra cost of the materials because they believe it will pay off when sustainability-driven product design becomes conventional, as Samsøe Samsøe also assume (anonymous interviewee, 2023; anonymous interviewee, 2023). Even if absorbing the cost does not generate profit for the company, the philosophy of Ganni Sustainability & CSR Director Lauren Bartley is that the company at least needs to try even knowing it may not work. This relates back to risk from chapter 2.x, in which the risk of absorbing the increased cost of products made of innovative materials is, in this case, evidently outweighed by not experimenting with innovative materials. This also reflects De Miguel De Blas (2020) findings that often sustainable innovations are not viable in the short-term financially, but instead in the long-term; it also aligns with Forsman's (2013) study that found firms that had established competitive advantage and profits *before* undertaking innovation were more likely to gain market-related advantages, yet short-term efficiency-related disadvantages.

Whilst Son of a Tailor's unique selling point is it's custom-fitted, JIT products, its fundamental identity stems from the industry-wide problem of overproduction. When asked about the role of environmental sustainability in product design, the interviewee explained that whilst they choose more environmentally-sustainable products wherever possible, it was mostly due to the higher functionality they offered in terms of creating longer-lasting garments of high quality; in particular, in Europe their customers prioritise Son of a Tailor over other brands because of their quality and the handcraftsmanship involved in their production. In this way, product differentiation drives innovation and product development where increased positive environmental sustainability is an externality. The main role of product differentiation for this firm is the custom fit, with the intentions that the customer does not turn to another brand to find a better fit. However, since the longer lifecycle intentions for the garment play a role in this, it can be argued that environmental sustainability plays a minor role in driving eco-innovation and environmentally-sustainable product development in terms of company reputation and providing sustainability to the brand image so that the garment can still be worn over time and resold, where possible. Additionally, the company offers a free new product if the garment does not fit correctly, intentionally to reduce the emissions footprint of returns; as well as the JIT-manufacturing which means no warehousing, thus also limiting the emissions footprint of their operations.

The quest for a unique product differentiation that firms can offer in their products over their competitors acts as a driver for eco-innovation and environmentally-sustainable product design

because it creates a unique selling point to consumers and caters for a niche target segment that prioritise sustainability in their purchases. Since environmental sustainability often means higher quality, as seen in Son of a Tailor, it drives a more environmentally-sustainable product design in this case by default. As with Ganni and Samsøe Samsøe, pursuit of product differentiation with eco-innovation and based on environmental sustainability prepares the companies for the future market trends they anticipate.

5. Conclusion

The study found that the key drivers for eco-innovation and environmentally-sustainable product design in small- to medium-sized fashion firms in Sweden and Denmark are: the founding vision and core 'inner' identity of the company and its brand; internal policies; and pursuit of a unique product differentiation for both the market now and in the future.

Companies that prioritise sustainability as a foundational principle are intrinsically driven to seek innovative solutions and implement environmentally-conscious practices that are essential to their products. Internal policies that establish and enforce comprehensive environmentally-sustainable ambitions drive innovation and product design and development towards more environmentally-sustainable products, which is closely related to the studies mentioned in Chapter 2.vii.b where management style can influence company culture and in turn, company prioritisations. Finally, fashion companies that emphasise product differentiation through environmentally-sustainable features and enhancements are driven to engage in eco-innovation to not only meet the shifting needs of more environmentally-conscious consumers, but also to pre-emptively ensure competitive advantage going forward as the anticipated market shift occurs towards more sustainable fashion. This aligns with previous studies, discussed in Chapter 2.viii, that show competition and company reputation as a driving factor in innovation.

The study also found that several other factors act as a catalyst for eco-innovation and pursuing more environmentally-sustainable product design. One such catalyst was local culture, where Sweden and Denmark already have high interest from consumers, especially in Denmark, in more environmentally-sustainable products; this is complemented by a low hierarchal corporate culture where values, priorities, and ideas can be communicated across an organisation rather fluidly. A thriving economy can also act as a catalyst, in which customers are more motivated to try new products thus driving companies to innovate. The pursuit of agility and adaptability towards potential directions in policy, the market, and the competitive environment also acted as a catalyst for more sustainable product development. Finally, certifications and regulations that constantly require more stringent environmental measures for companies that are certified drive companies to innovate and produce more environmentally-sustainable products. This closely related to the literature in Chapter 2 that discusses competition and corporate reputation (Chapter 2.viii) and the influence of external policies and regulations (Chapter 2.iv).

The research provides a unique value as the issue of environmental sustainability becomes more relevant to the fashion industry and firms requires a comprehensive understudying of how their sustainable business growth relates to the issue of fashion's environmental sustainability and how their products can be as environmentally-sustainable as possible and still experience business growth. An understanding of the key drivers and motivations of undertaking eco-innovation and environmental sustainability in product development as identified out in this outcome of this study will provide Swedish and Danish fashion companies information for strategic decision-making in terms of aligning their products with the market which is changing and becoming more environmentally-sensitive; to understand threats, risks, and opportunities that affect their business operations such as reputation and brand identity; to become more agile and increase ability to adapt to the evolving business environment, and to be able to attract both employees and stakeholders by aligning the company with industry expectations of a direction towards more environmentally-sustainable practice. As the fashion industry in its current operative state does not support sustainability, in which their activities today do not foster the ability of firms of future generations to be able to continue in the same way, an understanding of the drivers and motivations behind eco-innovation in product development is highly valuable.

Where there is a market and government incentives for companies to develop more eco-innovative products, the green market can turn into a very attractive alternative for many companies (Bossle, de Barcellos, Vieira and Sauvee, 2016). The results of the study demonstrate that ultimately, companies should have a proactive, not reactive, approach as it has a purpose, amongst others, of paving the way for future business and not just about addressing the issue of current fashion unsustainability and the contradiction between fashion trends and an environmentally-responsible lifecycle of products. The study demonstrates to other firms, other industries, and the global fashion industry as a whole as well as other stakeholders such as policymakers and consumers the reasonability of capabilities and potential in successfully pursuing more environmentally-sustainable product designs.

i. Suggestions for Further Research

One suggestion for future research that arises from this study is how to avoid greenwashing. Although as mentioned, these companies publicly acclaim their internal policies in order to hold themselves accountable and prioritise transparency, it could be valuable to the results of this study and to the industry as a whole to study in-depth how these driers of pursuing environmental sustainability could also act as a method of greenwashing in attempt to enhance company image and corporate reputation.

Additionally, although the key findings showed that companies had a company vision of pursuing environmental sustainability in their products from the very foundation of their organisation, it could be interesting and insightful to investigate where the common and popular wish to pursue and prioritise this originates. Whilst issues of fashion and environmental sustainability is explored in depth and problematised in Chapter 2, and companies such as Son of a Tailor attribute their very purpose to be based on this, the roots of prioritising environmental sustainability in business models in order to obtain competitive advantage could be researched further.

Finally, as this study is limited to a select range of SMEs, an investigation into drivers of eco-innovation and environmentally-sustainable product design that considers large enterprises who may be too big to make significant changes to their value chain could also be valuable. This potential study could explore the impact of size, maturity, and/or economies of scale and/or scope on the risks of pursuing eco-innovation; especially in comparison to a start up such as Son of a Tailor. One such firm that could be interesting to study could be Swedish fast fashion giant H&M.

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7. Appendix

Table 3: Questions used for the interviews

Questions for the interviews:
What are the drivers for sustainability in your company?
What are the strongest forces/pressures to eco-innovate?
What factors would drive the company to reinvent its business model to be more environmentally-friendly?
Are there any structures in place/aspects of the company that allow for/encourage eco-innovation?
Ask about the background/development/idea generation of specific initiatives they have done.
Are there any obstacles/what are the barriers for sustainability initiatives in your company?
What certifications do you have? Did you proactively change anything in the business to comply with these so that the certifications acted as a driver for change?
What is the role of environmental sustainability within the company and the designs/products?
What are the main motivations for incorporating environmental thinking?
How do you prioritise sustainability and environmental considerations in the product development process?
How have your specific eco-innovations been received by customers?
Can you tell me about the role of:
Consumer demand?
Regulations?
Transparency?
How do you say up to date with these? Is this someone's responsibility or?
What are the economic advantages of undertaking eco-innovation/sustainability thinking?