The Extended Producer Responsibility for textiles

Potential impacts for Finnish textile firms

International Business

Master's thesis

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Over the past three decades, consumer attitudes toward clothing have undergone a significant transformation. Where garments were once valued as durable, long-lasting items, they are now often perceived as short-lived and disposable. This shift has mostly happened because of fast and ultra-fast fashion, which has helped the industry grow quickly but has also caused serious environmental and social problems. Overproduction, excessive consumption, and the widespread disposal of textiles have contributed to increasing levels of waste and pollution which has exposed the urgent need for more sustainable practices within the industry.

In response to these challenges, the European Commission has proposed new legislative measures to improve the sustainability of the textile sector. A key part of this initiative is the introduction of Extended Producer Responsibility (EPR) for textiles, a regulatory framework that makes producers responsible for the entire lifecycle of textile products, which includes their design, manufacturing, disposal, and recycling. EPR aims to transfer end-of-life responsibility from municipalities and consumers to producers, encouraging more sustainable product design, circular business models, and better waste management.

This thesis explores the expected impacts of EPR on Finnish textile firms, with the primary objective of understanding how this regulatory shift may affect the sector. The study further addresses two sub-questions: the opportunities and challenges associated with the EPR for Finnish textile firms. Together, these investigations provide a broader understanding of the expected implications of upcoming EU legislation.

The literature review introduces the concept of sustainability, particularly its environmental and social dimensions, and presents the circular economy (CE) as an alternative model to the current linear system. EPR is examined in depth as a policy tool to support circular practices. The empirical part of the study uses a qualitative approach, collecting insights through semi-structured interviews with eight experts from organizations involved in or connected to the Finnish textile industry.

The findings show that while companies are already exploring strategies such as durability-focused design and take-back schemes, they face practical obstacles, especially in scaling recycling technologies and developing markets for recycled materials. Concerns also arise around uneven enforcement, competitiveness, and the rebound effect. Despite these challenges, the study concludes that EPR has the potential to drive important change, provided it is supported by strong implementation, infrastructure investment, and shifts in consumer behavior.

Key words: Extended Producer Responsibility (EPR), sustainable textiles, textile waste, circular business models, Finnish textile industry

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Viimeisten kolmen vuosikymmenen aikana kuluttajien suhtautuminen vaatteisiin on muuttunut merkittävästi. Siinä missä vaatteita aiemmin arvostettiin kestävinä ja pitkäikäisinä hyödykkeinä, nähdään ne nykyään usein lyhytikäisinä ja kertakäyttöisinä tuotteina. Tämä muutos on tapahtunut pääosin pika- ja ultrapikamuodin myötä, joka on vauhdittanut suunnattomasti alan kasvua, mutta se on samalla aiheuttanut vakavia ongelmia niin ympäristölle kuin yhteiskunnalle. Ylituotanto, liiallinen kulutus ja tekstiilien laajamittainen hävittäminen ovat lisänneet jäte- ja saastekuormitusta, mikä on tuonut ilmi kiireellisen tarpeen kestävämmille toimintatavoille tekstiilialalla.
Vastauksena näihin haasteisiin Euroopan komissio on ehdottanut uusia lainsäädännöllisiä toimia tekstiilialan kestävyyden parantamiseksi. Keskeinen osa tätä aloitetta on tuottajavastuun (Extended Producer Responsibility, EPR) luominen tekstiileille. Tuottajavastuu tarkoittaa sitä, että tuottajat olisivat vastuussa tuotteidensa koko elinkaaresta, johon kuuluu niiden suunnittelu, valmistus, kierrätys sekä huolehtiminen niiden loppusijoituksesta elinkaaren päätyttyä. EPR pyrkii siirtämään vastuun tuotteen elinkaaren loppupäästä pois kunnilta sekä kuluttajilta suoraan tuottajille, kannustaen näin kestävämpään tuotesuunnitteluun, kiertotalouden liiketoimintamalleihin sekä parempaan jätehuoltoon.

Tämä opinnäytetyö tarkastelee EPR:n odotettuja vaikutuksia suomalaisiin tekstiilialan yrityksiin. Tutkimuksen päätavoitteena on ymmärtää, miten tämä sääntelymuutos saattaa vaikuttaa alaan. Lisäksi tutkimus käsittelee kahta alakysymystä: EPR:n tuomia mahdollisuuksia sekä haasteita suomalaisille tekstiilialan yrityksille. Nämä tarkastelut yhdessä tarjoavat laajemman käsityksen tulevan EU-lainsäädännön mahdollisista vaikutuksista.

Kirjallisuuskatsauksessa esitellään kestävyyden käsitettä erityisesti ympäristön ja sosiaalisen vastuun näkökulmista. Lisäksi katsauksessa tarkastellaan kiertotaloutta vaihtoehtoisena mallina nykyiselle lineaariselle järjestelmälle. Lopuksi EPR:ää analysoidaan syvemmin politiikan keinona tukea kiertotalouden käytäntöjen omaksumista.

Tutkimuksen empiirisessä osuudessa hyödynnetään laadullista tutkimusotetta. Aineisto on muodostettu puolistrukturoitujen haastattelujen avulla. Haastattelut on kerätty kahdeksalta asiantuntijalta, jotka edustavat suomalaisen tekstiilialan parissa toimivia tai siihen liittyviä organisaatioita.

Tutkimuksen tulosten mukaan yritykset ovat jo kehittämässä erilaisia strategioita, kuten kestävää tuotesuunnittelua ja tuotteiden takaisinottojärjestelmiä. Vielä kuitenkin yritykset kohtaavat käytännön haasteita erityisesti kierrätysteknologioiden skaalaamisessa ja kierrätysmateriaalien markkinoiden laajentamisessa. Huolia herättävät myös sääntelyn epätasainen toimeenpano, kilpailukyky ja niin sanottu rebound-ilmiö. Näistä haasteista huolimatta tutkimus osoittaa, että EPR:llä on potentiaalia edistää merkittävää muutosta, edellyttäen että sen toimeenpanoa tuetaan tarpeeksi, infrastruktuuriin investoidaan sekä kuluttajakäyttäytymistä saadaan muutettua.

Avainsanat: Tuottajavastuu, kestävä tekstiiliala, tekstiilijäte, kiertotalous, suomalainen tekstiiliala

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1 Introduction

This thesis explores Extended Producer Responsibility (EPR) for textiles and examines how the upcoming policy is expected to impact the Finnish textile sector. It reviews literature on sustainability challenges in the textile industry, the role of circular business models as potential solutions, and the definitions and considerations related to EPR for textiles. The following section outlines the research background and context, defines key concepts, identifies the research gap, and presents the research question.

1.1 Background

In the last three decades, consumer views on clothing have changed. Clothes were once seen as durable items meant to last and be reused. Now, they are often treated as short-lived products, thrown away after little use to make room for constant new purchases. (The Or Foundation, 2023.) The modern textile industry emerged during the 19th-century industrial revolution, shifting from handmade garments to mass production through innovations such as the sewing machine and factory systems (Chavan, 2018). In addition, fashion has always been deeply connected to culture, reflecting societal values and spreading popular trends (Ding, 2023). This cultural influence has driven demand for rapid trend turnover, fueling the rise of fast fashion with shorter product cycles and impulsive consumer behavior (Ellen MacArthur, 2020).

The combination of extremely low prices and the rapid turnover of trendy styles has attracted significant consumer attention in Western markets, contributing to the expansion of the fast fashion industry. More recently, this trend has intensified with the rapid rise of the ultra-fast fashion sector. Products are designed or selected through demand-driven trend modelling, which leverages diverse data inputs, including current trends, viral products, and consumer perceptions. This type of production is associated with fast trend cycles, which are accompanied by ultra-affordable products. (McKinsey & Business of Fashion, 2023.) While the developments in the fashion field have attracted consumers to spend more, the industry has grown and fostered a throwaway culture in the textile industry, leading to overconsumption and single-use purchases. (Wills, 2021.)

Therefore, the textile industry has experienced substantial growth and transformation in recent years. Which also means that, the textile industry is a significant business sector due to its extensive economic contributions, employment opportunities, and essential role in global trade. In 2023, the textile industry in the European Union generated a turnover of 170 billion euros (Statista, 2024). In addition, the industry provides a high level of employment globally. It ranks as the third largest

employer worldwide as it employs nearly 13 million full-time workers in its supply chain to manufacture clothing, textiles, and footwear consumed within the EU in 2020. (European Environment Agency, 2024.)

However, the textile industry is facing challenges in addressing its contributions to the triple planetary crisis, which includes climate change, nature loss, and pollution (United Nations Environment Programme, 2023.) In Europe, textiles have the fourth largest environmental and climate impact, coming after food, housing, and mobility European Commission (n.d.). It accounts for approximately 4–6% of the European Union's environmental footprint across various impact categories (Köhler et al. 2021). Additionally, it ranks among the top three pressures on water and land use and is within the top five for greenhouse gas emissions and raw material consumption in the EU. (European Commission: Directorate-General for Environment, 2023). Furthermore, the supply chain has significant social consequences, exposing textile workers to risks such as underpayment, forced labor, health hazards, and abuse (United Nations Environment Programme, 2023).

The harmful impacts of the textile industry arise from multiple factors throughout a product's life cycle, such as the complex supply chain of textiles and the amount of waste generated. The sector encompasses a diverse range of stakeholders, such as suppliers, brands, retailers, logistics and distribution partners, customs authorities, and various service providers. This complexity creates an industry where sustainability is not always a consistent priority across all actors in the value chain. (Shih & Agrafiotis, 2015, 1027.) Because consumers are often distant from the source of production, they may lack awareness of issues within the global supply chain. These extended networks limit both transparency and traceability for all parties involved. (Dzhengiz et al. 2023.)

In addition, as fast fashion has increased the demand for new products the size of the full production chain has increased. Today, fashion brands produce nearly double the amount of clothing than they did before the year 2000. (Niinimäki et al. 2020.) Furthermore, the consumer behavior of throwing the product away early in the product life-cycle reforms major waste problems. (Lacy et al. 2020, 186.) Currently, around 78% of consumer waste, covering clothing and footwear, household textiles, and technical textiles, is not collected separately. This implies that the waste becomes part of mixed household waste, which is directed to incineration or landfill sites without any opportunity for further use or recycling (Huygens et al. 2023, 11).

Although there is some progress towards a more sustainable textile industry, the changes are insufficient to meet upcoming regulations. The industry mostly relies on the polluting use of fossil fuels, and circular business models are only just beginning to develop. At the current rate of progress,

the consumption of clothing and footwear is projected to rise by more than 60 percent, from 62 million tonnes in 2019 to 102 million tonnes by 2030. As consumption levels rise, the volume of waste generated correspondingly increases. (European Commission, 2022.) Furthermore, mismanagement of waste leads to pollution and environmental harm, with clear consequences for human well-being. However, when managed effectively, waste can become a driver of value, as reused and recycled materials contribute to both ecological sustainability and economic growth. (European Council, 2025a.) Therefore, holding producers accountable for the waste generated by their products is significant to prevent the amount of textile waste from increasing as the industry expands. (European Commission, 2022.)

The European Commission has decided to interfere with the issue. On the 5th of July 2023, the European Commission introduced regulations to hold producers accountable for the entire lifecycle of textile products and to promote the sustainable management of textile waste throughout the EU. The European Commission has proposed the implementation of mandatory EPR for textiles, which would aim to expedite the growth of the textile collection, sorting, reuse, and recycling sectors. (European Commission, 2023b; 2025b) It serves as a crucial mechanism for implementing the "polluter pays" principle (OJEU, 2012). EPR would shift the responsibility for end-of-life costs from municipalities and, ultimately, citizens to producers (Eunomia, 2022,). Besides, it is aligned with the EU Strategy for Sustainable and Circular Textiles, which aims that all the available textile products in the EU market will be durable and recyclable, mostly composed of recycled fibers, free of hazardous substances, and manufactured with respect to social rights and environmental standards by 2030. EPR for textiles is one of the key targets of the EU Strategy. (European Commission, 2022).

On the 19th of February 2025, a provisional agreement was reached by the Council presidency and European Parliament representatives on updating the waste framework directive, with new steps to promote sustainability and lower waste generation in the textile industry. The provisional agreement introduces unified rules on EPR for textile manufacturers and fashion brands. Enhancing collection systems, automating sorting processes, and innovating textile recycling technologies remain challenging tasks. Implementing EPR policies and establishing a circular economy model require broad consensus among key stakeholders. (Juanga-Labayen et al. 2022, 175). Furthermore, Brewer (2019, 8) argues that legislative reforms demanding sustainable practices are crucial for reshaping the textile industry and raising consumer awareness to counter fast fashion. Additionally, EU regulations and sustainability initiatives may influence consumers to make more sustainable choices (European Parliament 2019). Thus, the upcoming regulations will affect every stage of the fashion value chain,

from design to marketing, shaping the way both consumers and companies operate worldwide (McKinsey & Business of Fashion, 2023, 90).

1.2 Context

The Finnish textile industry is currently undergoing a period of transition. As the EU introduces new regulations aimed at a more sustainable textile sector, large non-EU competitors are rapidly expanding their market share, drawing customers away from Finnish companies. But at the same time, Finland is well-positioned to lead the transformation of the textile sector within the global landscape. Numerous promising pilot initiatives and industrial investments are underway, particularly in the development of new, sustainable textile fibers and recycled materials. With strong capabilities in design, digitalization, circular economy, and industrial production, Finland is well-positioned to drive the development and scalable customization of advanced, high-value-added textile solutions. Finland is also a global leader in bio-based raw materials and smart textile technologies. (Kamppuri et al. 2021.)

Currently, the clothing sector's product range includes women's, men's, and children's apparel, accessories, sportswear, as well as socks and underwear. The clothing industry also encompasses workwear. Some of the largest Finnish companies in the sector include Luhta, Marimekko, Reima, and Image Wear. (STJM, 2024.) However, building a textile cluster in Finland would need both production investments and stronger international trade, especially in the consumer sector, to ensure Finnish innovations translate into sustainable growth. Embracing the potential of the data economy, robotics, and automation is also key to delivering high-quality, personalized, and sustainable products to global markets. Furthermore, one of Finland's current weaknesses is that the market is not large enough. (Kamppuri et al. 2021)

A major challenge is that consumer spending on clothing and textiles is currently flowing out of Finland, for instance, to third countries such as China. In recent years, China has accounted for 30–45% of the EU's imports of clothing, footwear, and apparel-related products (Kaaresvirta et al. 2023). Furthermore, according to the World Integrated Trade Solution database, China was one of Finland's primary sources of textile and clothing imports in 2022 (WITS, 2022). Fast fashion brands such as Shein and Temu have disrupted the textile industry by flooding the market with low-cost, disposable clothing (Niinimäki et al., 2020). The ultra-fast fashion brands target shoppers with a fast-moving range of low-cost products sold online and marketed through social media. For example, Shein's network, composed largely of around 1,000 small-scale factories, is supported by an advanced IT

system that facilitates an exceptionally efficient value chain. This system enables daily product releases and maximizes the logistical and manufacturing advantages. (Dieleman, 2023).

According to Finnish Customs statistics, a total of 28 million e-commerce parcels arrived in Finland in 2024, and nearly 98 percent of the parcels came from China. The majority of the parcels were of low value, meaning they were worth less than 150 euros. Small parcels are specially ordered from Chinese platforms such as Temu, Shein, and AliExpress. (Tulli, 2024.) Temu began more aggressive marketing in Finland last year, and a significant portion of the growth can be attributed to the platform. According to the Finnish Commerce Federation, Temu became the largest distance-selling platform in Finland last year. (Yle, 08.02.2025.)

The Finnish Commerce Federation, together with other Nordic retail industry advocacy organizations, has actively highlighted the challenges related to marketplaces operating from third countries and the competitive disadvantages they cause. The Federation has, for example, conducted test purchases, which clearly revealed significant issues with product safety and regulatory compliance for goods sold on the Temu platform. (The Finnish Commerce Foundation, 2024.) The majority of Temu parcels pass through Finnish Customs without inspection. As many as 100,000 packages can arrive at once by air freight, of which only a small fraction is checked. (Yle, 08.02.2025.)

The key concern is that the Chinese e-commerce platforms currently lack a physical importer or warehousing presence within Europe. As a result, goods are dispatched directly to consumers from non-EU countries, effectively placing these platforms outside the scope of current regulatory frameworks. Whereas companies operating within the EU internal market are subject to strict regulations and face numerous obligations that companies outside the EU are not required to follow. Obligations and fees related to the recycling of products and packaging are a good example of this. In practice, companies operating in Finland also end up bearing the responsibilities of companies that supply goods to Finland from outside the EU. (STJM, 2025.) This topic is particularly significant given that a provisional agreement on EPR has been reached, bringing the implementation of binding regulations increasingly closer. Once formally adopted, EU member states will have up to 20 months to align their national legislation with the new regulations. Therefore, it is anticipated that the regulation will become binding in Finland by 2029. (European Council, 2025c.)

1.3 Definitions of the key concepts

The definitions of the key concepts central to this study are summarized in Table 1 below. By clarifying these terms, it enhances the reader's understanding and supports the overall coherence of

the study. Additionally, the chapter addresses the limitations of these concepts, which arise from time constraints and the defined scope of the study.

Table 1: The key concepts of the study

Key concept	Definition	Reference	Clarifications
Textile industry	The textile industry involves economic activities aimed at producing fibers, yarns, fabrics, clothing, and textile items for consumers, as well as for technical and industrial businesses. The textile sector is one of the oldest and most complex industries, covering the entire production cycle from raw materials to finished products.	Bullon et al. (2017, 41)	This study uses the term "textile industry" to mainly refer to consumer textiles, specifically within the clothing sector. This includes fashion clothing, apparel, and accessories.
Fast fashion	Fast fashion is defined as low-priced textiles that follow the current trends in the fashion field. It is a profitable business model that simplifies the supply chain to bring trendy, mass-produced imitations of catwalk styles to stores quickly and at affordable prices	Joy et al. (2012, 273-274), Barnes & Lea-Greenwood (2006, 257)	
Sustainability	Sustainability involves many global and local factors that affect people's health and lives, including the environment, society, and the economy. Meeting today's needs while ensuring that future generations can meet theirs.	Brundtland (1987, 41), Joy et al. (2012, 274)	This study primarily focuses on the environmental dimension of sustainability, while briefly addressing its social aspects.
Circular economy (CE)	The circular economy model emphasizes maintaining the value and functionality of manufactured assets, while also striving to retain resources in their highest-value form.	Stahel (2019, 6)	
Extended Producer Responsibility (EPR)	A policy approach aimed at encouraging environmental improvements throughout the entire life cycle of a product by extending the manufacturer's responsibility to include all stages from production	Lindhqvist, (2000, 5)	It is important to note that EPR for textiles is not yet binding in the EU, as only a provisional agreement has been reached. Due

	to take-back, recycling, and final disposal.		to that, the exact regulations and implementation details remain still uncertain. However, this study approaches EPR under the assumption that full responsibility will be placed on producers.
The Waste Framework Directive	The Waste Framework Directive outlines fundamental principles and definitions for waste management in the EU. It classifies different types of waste, including hazardous waste, and clarifies when waste transitions into a secondary raw material. It also establishes the waste hierarchy, which is a priority system that emphasizes waste prevention as the most desirable option. Disposal is considered a last resort, used only when reuse, recycling, or recovery is not possible. The upcoming EPR regulations are under the Waste Framework Directive.	European Council (2025a)	

The concepts introduced in Table 1 will be further explored and developed throughout the study. However, having a prior understanding of these concepts enhances the reader's ability to follow the research more effectively. The reader may refer back to this table at any point for clarification of key concepts discussed in the text.

1.4 Research gap and research questions

Sustainability and transitioning into more circular textile production and consumption have been strongly acknowledged in the 2020s. However, despite growing awareness, several areas remain underexplored. To mitigate the environmental harm caused by textile waste, a comprehensive and efficient waste management system is needed. This shift requires governments to implement strategic policies. Since the final version of the EPR directive is still upcoming, it is essential to explore stakeholders' perspectives on the forthcoming legislation. This also allows companies to prepare for the upcoming regulations and understand the anticipated responses to EPR.

In addition, there is a significant lack of research on how Finnish textile companies see the effects of Extended Producer Responsibility and their attitudes toward it. The opportunity for brands to ensure compliance is narrowing rapidly as the regulations are upcoming shortly. In other words, the textile industry is not progressing sufficiently toward its sustainability targets and is not aligned with global commitments, such as the Sustainable Development Goals (SDGs) and the Paris Agreement on climate change. (UNEP & UNFCCC, 2023). Therefore, research on EPR is essential, as studying its expected impacts can provide valuable insights to guide various stakeholders in the textile industry.

Furthermore, recognizing and responding to the potential impacts of EPR is essential for the Finnish textile industry, given its significance as a key business sector. The Finnish textile industry employs broadly 18,000 and generates a revenue of €3.95 billion. The future vision of the industry is that, with the right business practices, the sector could create up to €1 billion in new investments and 17,000 new jobs in Finland by 2035. (STJM, n.d.) In addition, according to the report by McKinsey & Business of Fashion (2024), around 12 percent of fashion executives highlight sustainability as a key opportunity. However, acknowledging the scale of the task and increasing regulatory demands, 12 percent also identify it as a major challenge. Thus, it is essential that the companies in the textile industry fully understand the new EU regulations and proactively plan responses that ensure compliance without compromising their business.

In the European Union, the separate collection of textiles became legally mandatory on January 1, 2025, as mandated by the amended 2018 EU Waste Framework Directive (European Union, 2018). Furthermore, the upcoming revision of the Directive will introduce EPR regulations for textiles (European Council, 2025b). This is anticipated to lead to a greater share of non-reusable textiles in separate collection systems, which is not a profitable situation. (Ellen MacArthur, 2020). Therefore, it is crucial for textile companies to consider the end-of-life phase of their products during the manufacturing process in order to reduce the volume of non-reusable textiles entering collection systems. That is a challenge that EPR aims to address, which emphasizes the importance of researching and identifying the attitudes toward the upcoming changes and how they are expected to change the business practices of textile companies.

While existing research has explored certain aspects of EPR's role in waste reduction, limited knowledge exists regarding its broader impacts. This study investigates how the experts in the field see the expected impacts of the Extended Producer Responsibility for textiles. To recognize the possible opportunities and challenges for Finnish textile firms, this study will primarily concentrate on experts' perceptions of the present and future states of Finnish textile firms. Furthermore, an

exploration will be conducted to identify how Finnish textile firms see and whether they are aware of the upcoming regulations of EPR. This includes extending the lifecycle of textiles, improving product repair and recycling options, and enhancing separate collection. Also focusing on how companies might respond to using recycled materials in their textile products. Given the limited existing academic discussion on the impacts, this study aims to delve deeper into the subject for a more comprehensive understanding. The research question is as follows:

- How is Extended Producer Responsibility for textiles expected to impact Finnish textile firms?

To gain an in-depth understanding of the subject, the main research question is divided into the following sub-questions:

- What opportunities could be associated with the EPR for textile firms?
- What challenges could be associated with the EPR for textile firms?

The main research question is examined through two sub-questions, each offering insights into the phenomenon under study. The study begins with a review of academic literature, industry reports, and press releases related to the research objectives in order to establish a comprehensive understanding of the research context. Based on this review, an initial conceptual framework is developed to guide the study. The empirical component involves interviews with eight participants who work in or are connected to the Finnish textile industry. This research applies the Extended Case Method, beginning with an analysis of the broader macro-level context and subsequently linking it to micro-level observations. Following the introduction of the study, the subsequent chapter will explore the key literature supporting the research.

2 Literature review

This section presents a comprehensive review of the current literature, key definitions, and theoretical foundations related to EPR for textiles. The discussion is divided into four subchapters. The first subchapter addresses sustainability challenges in the textile industry, with a focus on both environmental and social dimensions. The second subchapter examines circular economy models applicable to the textile sector as potential solutions to these challenges. The third subchapter defines EPR and discusses how it is conceptualized in existing literature, particularly in relation to textiles. Finally, the fourth subchapter summarizes the conceptual background and introduces the initial framework that guides this study.

2.1 Sustainability challenges in the textile industry

2.1.1 Defining sustainability

The concept of sustainability was already recognized in 1987 when the World Commission on Environment and Development explained it as encountering "the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland 1987, 41). Furthermore, sustainability emphasizes the responsible use of natural resources and aims to prevent the depletion of renewable resources. (Portney, 2015, 4–5.) However, this definition is more associated with the environment rather than business. While early sustainability models, such as the Triple Bottom Line (Elkington, 1997), emphasized balancing environmental, social, and economic factors, they lacked a clear roadmap for implementation. More recent approaches, such as the Circular Economy framework**,** provide a concrete model for achieving sustainability by closing resource loops, minimizing waste, and extending product lifecycles (Ellen MacArthur, 2013; 2019; Stahel, 2016; 2019). Sustainability and the circular economy both envision a responsible society that harmonizes social, environmental, and economic needs (Stahel, 2019, 9).

Furthermore, in academia, sustainability is understood as a phenomenon that contains complex dynamics that influence human lives and health with ecological, socio-political, and economic factors globally and locally (Joy et al. 2012, 274). Given its evolving nature, sustainability is defined in various ways across disciplines. In this study**,** sustainability is framed through the circular economy model**,** emphasizing closed-loop systems, resource efficiency, and waste reduction as key principles (Ellen MacArthur, 2013). However, achieving sustainability in business operations requires integrating sustainable performance into the company's strategic planning, organizational culture, risk management, and commitment to transparency (Carter & Rogers, 2008, 369).

According to the United Nations (2020, 45), the textile industry [with fashion representing the largest proportion] can be considered sustainable when it is "resource-efficient and renewable resources-based, producing non-toxic, high-quality and affordable clothing services and products, while providing safe and secure livelihoods". Yet, in recent years, the textile industry has faced significant criticism for its lack of attention to social and environmental concerns caused by its business practices, bringing up the non-financial costs of fashion to the global discussions. (McKinsey & Business of Fashion, 2023). A key driver of sustainability challenges in the textile industry is its complex supply chains.

Every phase of the textile supply chain carries environmental and social consequences (Fletcher & Tham, 2019), as the industry operates through an extensive and intricate supply chain. It begins with agriculture and petrochemical processes for fiber production and extends to manufacturing, logistics, and retail, while also involving a diverse group of stakeholders (Muthu, 2014, 2; Niinimäki et al, 2020, 190). Consequently, fast fashion companies find it advantageous to outsource their production to countries with lower costs (Joy et al. 2012, 275–276), for instance, Bangladesh and China (Hemphill & White, 2018). Furthermore, the operation of textile supply chains currently follows a primarily linear model (Ellen MacArthur 2017, 19), characterized by a material flow that starts with resource extraction, proceeds through production and consumption, and ultimately culminates in waste generation (Ness 2008, 290).

2.1.2 Environmental impact of textile production

Currently, the textile industry fails to embody the principles of sustainability. The quick cycles of production and consumption cause significant concerns for environmental sustainability. (Arrigo, 2020). Each stage of the complex supply chain exerts an ecological impact due to the consumption of water, materials, chemicals, and energy (Niinimäki et al. 2020). Annually, the textile sector contributes 2–8 % of global greenhouse gas emissions, consumes enough water to fill 86 million Olympic-sized swimming pools, and accounts for 9 % of microplastic pollution in the oceans (United Nations Environment Programme, 2023). On top of that, the EU textile industry produces around 16 million tons of waste each year. Without proper legislation actions, such as EPR, textile waste will continue to overload landfills and pollution systems (European Environment Agency, 2024a).

Globally, most textiles are lost once discarded. Figure 1 illustrates the flow of waste through the textile production process and its final use, showing that in the EU, 88% of discarded textiles end up in mixed household waste, ultimately being incinerated or sent to landfills (European Environment Agency, 2024b). Textile products are rarely designed for durability and are difficult to recycle. Most

businesses rely on linear operations with high resource consumption, low utilization, and minimal recycling efforts. (Ellen MacArthur, 2024a.) The major concern is the increasing volume of new fashion items being produced as the life cycle of each product continues to decrease as fast fashion has transformed the market to consider textiles as disposable objects. The consumer behavior of throwing the product away early in the product life-cycle reforms major waste problems. (Lacy et al. 2020.) That has resulted in fewer than 1 % of all textiles recycling into new ones globally (Ellen Macarthur, 2020).

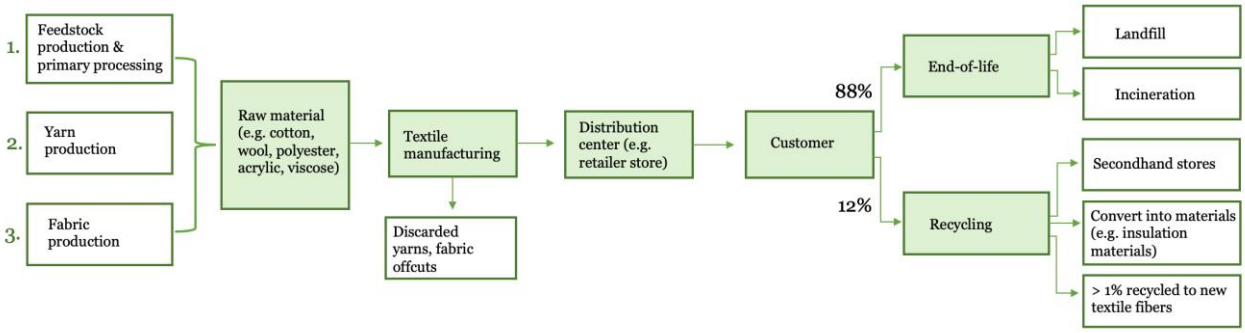

Figure 1: Overview of waste flow in a generic textile supply chain (own creation based on models from Baloyi et al. 2024, 509; TextileExchange, 2020)

As the Figure 1 shows, textile production starts with raw material extraction, moves through the manufacturing process, and ultimately reaches retailers before being sold to consumers. Throughout this process, significant natural resources are already consumed. The textile industry demands high usage of resources and is strongly dependent on raw materials from non-renewable resources. This, for instance, comprises fertilizers for growing cotton, oil for making synthetic fibers, and numerous chemicals for color production. (Lacy et al. 2020, 186.) Furthermore, most materials used in the fashion, textile, and clothing industries originate from the agricultural and oil sectors. These industries provide the natural, synthetic, and regenerated fibers that form the foundation of all textiles. (Wojnowska-Baryła et al. 2024.)

As fabric demand continues to rise, the environmental impact of fiber production and disposal has intensified. In 2023, the overall global share of recycled fibers experienced a slight decline, decreasing from approximately 7.9% to 7.7%. This reduction was primarily driven by the growing production of fossil-based polyester, which remained more cost-effective than its recycled counterpart. Consequently, the production of fossil-based synthetic fibers rose from 67 million tonnes in 2022 to 75 million tonnes in 2023. Alongside, pre- and post-consumer recycled textiles accounted for less than 1% of the global fiber market. (TextileExchange, 2024, 4).

One of the major issues is that the synthetic fibers do not biodegrade, which causes fabric waste to persist in the environment for centuries. In contrast, natural fibers are broken down by living organisms into water, carbon dioxide, methane, and non-toxic residues. However, during decomposition in landfills, they release toxic dye residues into groundwater and emit greenhouse gases into the atmosphere. Synthetic fabrics like polyester, acrylic, and polyamides are major contributors to microplastic fiber pollution. Small fragments from discarded textile waste enter drainage systems and eventually settle on the coastlines of heavily populated areas. (Baloyi et al. 2024.)

Once a consumer has used a textile product and no longer needs it, they dispose of it either through recycling or as waste. However, textiles discarded with mixed household waste are not separated for recovery. Instead, they are sent to landfills, incinerated, or left to degrade in the environment. Also, a large part of the collected textiles is sent to third countries eventually. Most of the material entering third-country reuse markets is already pre-sorted and labelled in Europe or other exporting regions. Despite the material being pre-sorted and labelled, for instance, around 40% still ends up as waste in the Kantamanto Secondhand Market in Ghana. Then, textile waste may be burned in open pits, discarded on beaches, dumped into rivers or seas, or disposed of in poorly managed landfills and dumpsites, which result in the release of harmful pollutants. (Ellen MacArthur, 2024a.) In addition, the textile industry utilizes a variety of harmful chemicals, such as heavy metals and significant organic pollutants, leading to the production of highly toxic waste which should be carefully reduced and managed. Moreover, the continuous expansion of the industry necessitates a strong focus on minimizing waste generation in the textile sector. (Selvakumar Paulraj et al. 2021, 59).

2.1.3 Social challenges of textile production

The textile industry plays a key role in offering entry-level employment in many developing economies. However, global trade growth has not translated into greater social or economic advancement for the least developed nations. (Fontell & Heikkilä, 2017, 313.) For instance, although the wages may meet minimum wage standards, they often fall drastically short of the living wage, leaving workers unable to save (Institute for Human Rights and Business, 2023). Although wages have risen in most countries, working conditions largely remain substandard, characterized by long, demanding hours, inadequate occupational safety and health measures, and frequent violations of fundamental labor rights. (International Labour Organization, 2022).

While women constitute a majority of garment workers, significant gender pay gaps persist, especially in countries with systemic challenges in women's labor market participation. In certain

workplaces, women face physical and sexual violence because of the gender dynamics of their work environments. (International Labour Organization, 2022). In addition, sweatshops are closely linked to the struggle of certain groups to meet their basic needs. Lacking viable alternatives, families, especially mothers responsible for household income, often feel compelled to accept jobs despite the health risks. (Moreira et al. 2022, 829).

One of the most alarming examples of fast fashion's social problems was the collapse of the Rana Plaza manufacturing facility, one of the deadliest industrial disasters in history. A total of 1134 workers lost their lives, while approximately 2500 sustained injuries. (Wieland & Handfield, 2013; Institute for Human Rights and Business, 2023). The disaster could have been prevented if clothing companies had prioritized safety since structural issues in the building were identified beforehand (Hemphill & White, 2018). In addition, it is important to highlight that similar accidents are not limited to Bangladesh as many crises have also taken place in other manufacturing countries (Institute for Human Rights and Business, 2023).

One reason for this is just-in-time manufacturing, a common practice in fast fashion that prioritizes cost-cutting and productivity. It forces workers to meet quotas under threat of wage cuts and causes suppliers to ignore minor but dangerous safety issues. (Institute for Human Rights and Business, 2023.) Furthermore, high temperatures in Bangladesh and Cambodia lead to negative impacts on factory worker's health and well-being. The workers are suffering from dehydration, sleep deprivation, and headaches due to the high temperatures. Indicating that employee productivity will decrease by approximately 1.5 percent for each degree the temperature rises above 25°C. (McKinsey & Business of Fashion, 2023.) However, also the current global trade in used clothing has significant economic and social impacts on workers involved in sorting, grading, and reuse, especially in importing countries. Even though they play an important role in supporting the circular economy, they often operate under precarious conditions and earn low incomes. Many of these workers have informal jobs, which makes their work unstable and insecure. Poorly sorted textile imports make the situation even harder. (The Or Foundation, 2023.)

A major challenge in achieving social sustainability in the textile industry is the lack of supply chain transparency. Due to the extensive use of subcontracting and the presence of informal workers, allows companies to distance themselves from ethical and legal responsibility, leading to unsafe working conditions and labor rights violations (Bubicz, et al. 2021.) The limited transparency around factory suppliers for specific brands and the frequent confidentiality surrounding subcontractor names for competitive reasons create an environment where accountability is often neglected (Institute for

Human Rights and Business, 2023). For this reason, monitoring and improving social sustainability in textile supply chains is challenging. In addition to limited transparency, challenges arise from the complexity of supply chains, vague monitoring standards, inadequate stakeholder collaboration, and inconsistencies in regulatory compliance and enforcement. (Bubicz et al. 2021, 280). Therefore, adhering to ILO labor standards, regulating subcontracting, increasing transparency in high-risk areas, fostering consumer awareness, and engaging local communities are essential for improving conditions in the global textile industry and supporting the workers producing its goods (Wieland & Handfield, 2013, 29).

To conclude, the fast fashion industry achieves lower consumer prices and increased sales primarily by reducing production and labor expenses. Nevertheless, the underlying linear consumption model, which prioritizes affordability and high turnover, proves environmentally and socially unsustainable. A critical pathway to improving sustainability within the textile sector is the adoption of circular economy principles. (Stahel et al, 2019, 4; Niinimäki et al, 2020.) The next chapter will present circular economy frameworks and their application to the textile industry.

2.2 Circular economy as a solution to textile waste

2.2.1 Positioning the circular economy with the linear economy

The circular economy (CE) model focuses on preserving the value and utility of manufactured assets including buildings, machinery, consumer goods, infrastructure, and vehicles. Additionally, it aims to preserve resources at their most valuable state. This approach differs from the traditional linear industrial economy in that it prioritizes maintaining value rather than generating added value, optimizing stock management rather than increasing production flows, and enhancing the efficiency of product use rather than simply improving production efficiency. (Stahel, 2019, 6.) The Figure 2 positions the linear and circular economy models.

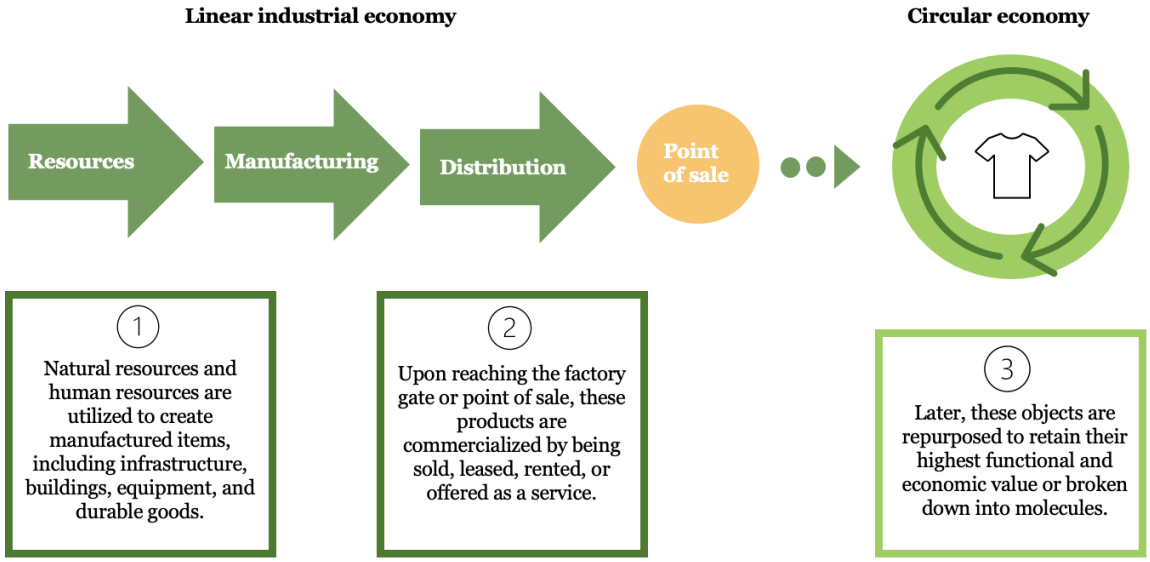

Figure 2: Positioning the linear and circular economy models (modified from Stahel et al. 2019, 3)

The circular economy represents a sustainable business model for the post-production phase, leveraging natural, human, cultural, and manufactured resources to enhance the ecological, social, and economic dimensions of sustainability (Stahel et al. 2019, 4). However, the CE model demands a change in mindset, along with advancements in technology and logistics, to treat waste as a valuable resource. By doing so, it reduces the reliance on virgin materials and lessens the strain on natural ecosystems and biodiversity. (Textile Exchange, 2022.) The CE model emphasizes the recovery and reintegration of high-value materials from waste into new production cycles. By extending material lifespans, it reduces dependence on raw materials and mitigates environmental pressures on natural resources. (Ellen MacArthur, 2019.)

In addition, transitioning to a circular economy model represents a viable approach for shifting the textile industry away from the current fast fashion model toward greater sustainability. The transition aims to significantly reduce the reliance on virgin materials and minimize waste generation by embedding economic and ecological principles within manufacturing processes. (Haas et al., 2015, 765). Over the past five years, the circular economy has become the leading approach for addressing challenges in the textile industry (Fletcher & Tham, 2019).

2.2.2 Understanding the circular economy framework

Lacy et al. (2020, 5) argue that the foundation of a CE model lies in fully utilizing products until the end of their life cycle, after which their components are reintegrated for further use. This process ultimately creates a zero-waste value chain that maximizes resource efficiency. Furthermore, Bocken et al. (2016, 317) explain that the CE aims to slow and close resource loops. Slowing the loops involves extending the product's life cycle, while closing the loops shortens the time between when a product is no longer used and when it returns to manufacturing.

Figure 3 illustrates circular business models and the circular approach to economic systems. Initially, materials are recovered for reuse, refinement, and repair. This is followed by a product design phase that prioritizes remanufacturing before using new raw materials, aligning with the central concept of recycling. In CE, material disposal is viewed as a last resort. This approach ensures that the value chain and product life cycle maintain maximum value and quality while optimizing energy efficiency. (Korhonen et al. 2018, 38.)

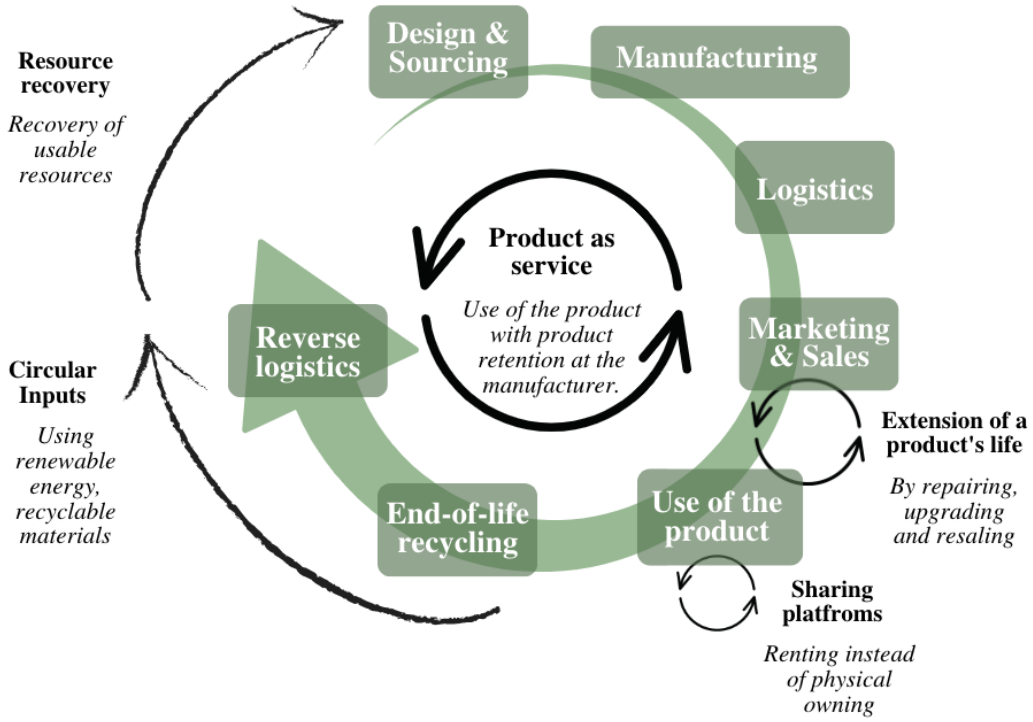

Figure 3: The five circular business models (modified from Lacy et al. 2020, 19)

Three of the five circular business models focus on production (circular inputs, resource recovery, and extension of a product's life), and the other two (product as a service and sharing platforms) focus on consumption and the connection between the product and the consumer. *Circular inputs* emphasize the materials used in products during the design, sourcing, and manufacturing phases. These inputs, such as renewable resources, are intended to minimize resource waste, including toxic substances and single-use materials. Then, *Product Use Extension* aims to maximize a product's lifespan. To achieve this, companies need to prioritize thoughtful product design and responsible sourcing from the start, ensuring products remain in use for as long as possible and avoiding premature end-of-life cycles. Whereas, *Product as a Service* and *Sharing Platform* models take "product utility" to a new level by reimagining how value is delivered, such as purchasing access to a function or service, like mobility, instead of owning the product itself, such as a vehicle. Lastly, when a product reaches the end of its use, *Resource Recovery* plays a key role in reclaiming the materials or energy embedded in it and reintegrating them into the production process, effectively "closing the loop" from sourcing to usage and back to sourcing. (Lacy et al. 2020, 19–20.)

These circular business models can create value for the company. Companies can shift away from traditional business models to create value more sustainably. This shift involves making sustainability a central part of their approach while recognizing the inevitable challenges and trade-offs that come with it. (Tapaninaho & Kujala, 2017.) The economic benefits of CE models include reduced costs associated with raw materials, energy consumption, environmental compliance, taxes, and waste management. Additionally, adopting green practices and building a reputation for responsible business can provide marketing advantages and help attract new customers. (Korhonen et al. 2016, 37, 40.) Therefore, the circular economy has garnered significant attention, likely due to its compatibility with existing commercial practices, implying that businesses can maintain an almost "business-as-usual" approach. (Fletcher & Tham, 2019.)

However, one of the biggest challenges of the CE is that it is built on the same economic framework that contributed to our current problems. While the CE prioritizes extending the lifespan of materials, it often overlooks a more fundamental question: does this approach lead to meaningful, system-wide improvements, or does it merely sustain resource flows without addressing the broader ecological constraints? By following the same economic paradigm that contributed to these challenges, the CE risks sustaining material circulation and also reinforcing underlying economic assumptions and perspectives that may be incompatible with long-term ecological sustainability. (Fletcher & Tham, 2019). In addition, while CE offers innovative solutions to some of today's most urgent challenges, it is crucial to understand the potential rebound effects that may arise even from solutions that fully

align with CE principles. (Levänen et al. 2021.) It means that the intended environmental benefits fail to materialize due to external factors. Similarly, this risk increases due to a limited understanding of the behavioral changes necessary for the successful and widespread adoption of circular practices. (Levänen et al. 2021.)

It is good to recognize that the concept of the CE presents familiar ideas, such as recycling, in a refreshed and appealing manner. However, its distinction from other mitigation strategies remains unclear. Nevertheless, if CE serves as an effective communication tool that accelerates policy action, it can indeed contribute to mitigation and emissions reduction efforts. Maintaining transparency and clearly defining different approaches can help ensure that CE discussions align more closely with its practical implementation. Additionally, for CE strategies to have a meaningful impact, they should be widely adopted. (Cantzler et al. 2020.)

2.2.3 Circular business models in the textile industry

In a circular economy, textile products are designed for extended use, made to be made again, and produced from safe, recycled, or renewable materials. Companies play a crucial role by contributing to infrastructure development relative to their market presence, ensuring that their products are efficiently collected and either reused, repaired, remanufactured, or recycled into new textiles. (Ellen MacArthur, 2024a.) Furthermore, the adoption of CE principles in fashion waste management could transform the textile industry, with an increased focus on resource efficiency and waste minimization. Designers could increasingly prioritize the development of products that are easy to recycle, fix, and reuse, helping manufacturers improve their production methods and adopt new recycling and upcycling technologies. Furthermore, initiatives such as take-back programs and rental services introduced by fashion brands and retailers could contribute to extending garment lifespans, playing a crucial role in significantly reducing textile waste. (Shamsuzzaman et al. 2025.)

Currently, minimizing the overall quantity of products within the system represents the most effective approach for guiding the sector toward more sustainable practices. According to Levänen et al. (2021, 5) CE approaches that focus on extending the lifespan of textiles through reduction and reuse appear to result in significantly lower global warming potential at the system level compared to CE innovations that emphasize emerging leasing models (sharing) or the production of reusable fibers from textile waste (recycling). This implies that minimizing the overall global warming potential of the textile value chain requires keeping clothing and other textiles in use for as long as possible. (Levänen et al. 2021, 5). In addition, textile reuse and recycling have the potential to lower environmental impacts by limiting the production of virgin fibers and avoiding resource-intensive

processes later in the product life cycle. Compared to incineration and landfilling, they offer a more sustainable solution. (Juanga-Labayen et al. 2022). Figure 4 illustrates the different CE approaches that reduce the need for virgin fibers and demonstrate how “waste” can be reintegrated into the production process at any stage.

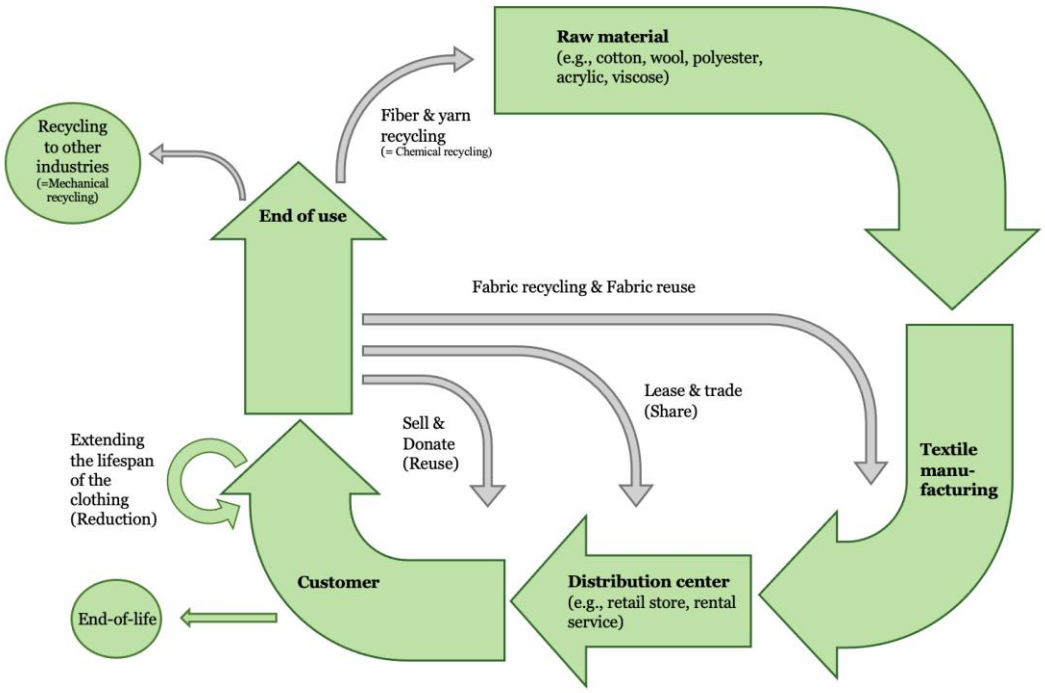

Figure 4: Example of a circular life cycle in the textile industry (own creation based on the model from TextileExchange, 2022)

In practice, textile reduction means that the user extends the lifespan of a piece of clothing, with the expected environmental benefits from the decrease in primary manufacturing (Levänen et al. 2021, 2). In other words, no new products need to be made because the user is still satisfied with the existing one. Whereas textile reuse is a waste management strategy aimed at extending the lifespan of textiles by transferring their use from one owner to the next (Bartl, 2011). It is typically done through activities such as renting, trading, swapping, borrowing, and inheriting, supported by second-hand shops, garage sales, online marketplaces, flea markets, and charitable organizations (Baloyi et al. 2024, 511).

Alternatively, textile recycling involves reprocessing pre-consumer and post-consumer textile waste into new textile or non-textile products (Juanga-Labayen et al, 2022, 179). Recent research has focused on transforming post-consumer waste into higher-value products, such as regenerated fibers (Baloyi et al. 2024, 512). Textile recycling is generally divided into two categories: mechanical and

chemical recycling. Mechanical recycling breaks down textile waste for decoration, construction, agriculture, and gardening applications. Chemical recycling, on the other hand, involves depolymerizing polymers (e.g., polyester) or dissolving fibers like cotton and viscose. (Juanga-Labayen et al, 2022, 179.) For instance, Spinnova, a Finnish textile fiber company, has developed a patented technology that produces textile fiber from waste materials like leather and textile waste without the use of harmful chemicals or the need for dissolving (Spinnova, n.d.).

Moreover, recycling textile materials occurs within open-loop and closed-loop processes. Open-loop recycling refers to a process where textile waste is repurposed into different products or applications, while closed-loop recycling involves converting waste materials back into the same type of product as the original. However, most textile waste contains a mix of fiber types and colors, leading to the production of low-quality fibers that are unattractive and unsuitable for respinning into high-quality yarn (as required in closed-loop recycling). (Baloyi et al. 2024.) For example, the Finnish company Rester facilitates the recovery of industrial textiles, transforming them into new fibers and high-quality raw materials. It offers both closed-loop and open-loop recycling processes, along with circular solutions for businesses. Their circular economy facility processes materials such as end-of-life textiles, clothing, uniforms, and workwear into high-quality raw materials for reuse. (Rester, n.d.)

Furthermore, a newer circular economy approach, textile sharing, is a strategy in which clothing items are leased or rented to multiple users throughout their lifecycle. This approach aligns with the principles of collaborative consumption, which assumes that environmental benefits arise from maximizing the utilization rate of a product. (Levänen et al. 2021.) For example, Robes Rental, a Finnish peer-to-peer fashion service, provides consumers a platform to rent high-end, high-quality garments. They aim to extend the lifecycle of individual garments by increasing their frequency of use, as many clothing items currently remain unworn in closets. (Pasanen, 2024.)

However, the above-mentioned circular economy strategies have a high risk of rebound. In the scenario of recycling, while raw material production is avoided, the high emissions from processing reused textiles into new materials limit overall global warming potential reductions. Similarly, the scenario of sharing increases product utility but risks higher consumer mobility, potentially leading to even greater emissions than linearly made clothing. Furthermore, reducing and reusing scenarios risk failing to replace primary production or slow consumption cycles as intended. (Levänen et al. 2021.) Therefore, extending the lifespan of clothing does not necessarily mean that individuals will maintain the same wardrobe, nor does reselling automatically lead to longer use. People may buy more second-hand clothing simply because it is affordable, rather than to reduce consumption. In

such cases, the impact on primary production remains unchanged. In addition, extended use and resale may not be feasible if clothing lacks sufficient durability. Therefore, supporting these practices may require new business models alongside the production of longer lasting or repairable garments. (Levänen et al. 2021.) Additionally, it is good to recognize that recycling aligns more naturally with established business models, whereas reduction and reuse approaches call for new actors and enterprises. Therefore, it is essential to promote innovative business models while also identifying reduction and reuse strategies that align with the interests of existing industry players. (Cantzler et al. 2020.)

However, setting ambitious circular economy targets, for instance, based on the polluter pays principle, can help move the textile sector away from its current linear approach. This is especially important when products are thrown away before reaching the end of their useful life. EPR helps address this issue by placing financial costs on waste and pollution through specific fees. This approach brings environmental impacts into the market system, creating stronger incentives for circular business models and helping to ensure fairer competition. (Ellen MacArthur, 2024a.) Additionally, strategies centered on reduce and reuse offer the most practical ways for achieving sustainability (Levänen et al. 2021). The next chapter will provide a more comprehensive definition and discussion of EPR.

2.3 Extended Producer Responsibility in the textile industry

2.3.1 Definition of Extended Producer Responsibility

The implementation and management of well-structured EPR schemes for various products play a pivotal role in facilitating an effective transition to a circular economy (Eunomia, 2022). The concept of EPR was first proposed by Thomas Lindhqvist in 1990, who originally defined it as:

> *"a policy principle to promote total life cycle environmental improvements of product systems by extending the responsibilities of the manufacturer of the product to various parts of the entire life cycle of the product, and especially to the take-back, recycling and final disposal of the product". (Lindhqvist, 2000, 5).*

OECD has defined EPR as a policy approach that holds producers accountable for their products throughout their entire lifecycle, including the phase after the products reach the post-consumer stage. An EPR policy involves (1) shifting responsibility (whether physical, economic, or both) upstream to producers and away from municipalities, along with (2) providing incentives for producers to consider environmental impacts in their product design. (OECD, 2024.) EPR programs are principally

about shifting the traditional responsibility for waste management among manufacturers, importers, consumers, and governments. While these programs vary in structure, they all share a core feature: producers and importers remain engaged with their products even after consumer use. (OECD, 2001.)

Shifting responsibility for post-consumer product treatment to producers gives a clear sign to manufacturers of environmentally harmful products to address the negative impacts of their products after consumer use. This, in turn, should encourage more sustainable product design. (OECD, 2001.) Thus, producers play a crucial role in the implementation of EPR policies. They can lessen the impact of their products across the entire lifecycle by changing their business practices, such as concentrating on choosing better materials and better waste management practices. (OECD, 2024.) Therefore, if the EPR fees are carefully adjusted based on product characteristics, it might encourage effective product modifications. This method, which incorporates variable fees, has been introduced only recently in certain EPR systems across Europe, Latin America, and North America. (OECD, 2024.)

According to OECD's report (2001), a critical step in creating an effective EPR scheme is setting clear policy goals and program objectives. These goals should be transparent and targeted toward specific environmental benefits, such as enhancing biodiversity, conserving natural resources, and promoting energy efficiency. The four main goals of EPR are:

- Reducing resource usage and conserving materials,
- Preventing waste generation,
- Designing products with better environmental compatibility,
- Closing material loops to support sustainable development.

EPR has effectively enhanced waste collection and recycling in developed economies, particularly for the primary product categories to which it has been applied. Efforts are now underway to expand EPR's scope to include additional goals and new product categories that involve plastics, such as textiles. Additionally, there is a movement to implement more precise fee structures that adjust fees based on product characteristics to reward the producers whose designs facilitate recycling or recovery. The fee structures are known as eco-modulation or advanced fee modulation. (OECD, 2024.) The criteria for adjusting EPR fees influence impacts across various stages of the product lifecycle. Thus, criteria such as recyclability, recycling rates, and the presence of hazardous substances can drive eco-design improvements that lower a product's end-of-life costs. (Laubinger et al. 2021.)

For instance, fees may be adjusted based on a product's recyclability level. Ideally, these criteria should relate to, recognizable features that are known to interfere with current recycling processes, including aspects such as product format, material, dimensions, colour, and transparency. Recycling processes are continuously advancing, not fixed. Adjusting EPR fees based on recyclability criteria might discourage innovation, favouring designs that align only with existing recycling technologies. Furthermore, EPR fees may also be adjusted based on the percentage of waste that is successfully recycled. Specifically, a bonus could be awarded to waste categories with above-average recycling rates over a set period, while categories with below-average rates may incur a penalty. However, implementing this method could be costly, as it requires detailed data and accurate tracking to differentiate recycling rates across various packaging types and materials.

In addition, hazardous substances in products can greatly elevate recycling costs, reduce the quality of recycled materials, and lead to serious environmental harm if not disposed of properly. Fee adjustments can be used to encourage the gradual elimination of these harmful substances. Thus, criteria such as recyclability, recycling rates, and the presence of hazardous substances can drive eco-design improvements that lower a product's end-of-life costs. (Laubinger et al. 2021.)

2.3.2 Textile waste management and Extended Producer Responsibility in current Finnish policy

In Finland, the responsibility for textile waste is currently shared between municipalities and waste holders. Additionally, private operators may undertake waste collection designated as the municipality's responsibility, provided they reach a separate agreement with the municipality regarding collection and treatment. Despite this arrangement, the municipality retains ultimate responsibility. (Salmenperä, 2017.) Currently, municipalities provide recycling bins for discarded textiles across the country, but the number of bins is still limited, and strict guidelines apply to what can be placed in them. Local operators are responsible for pre-sorting the textiles collected at these points. At present, the sorted textiles are transported to a processing facility, where they are further treated. The facility produces recycled fibers that are used as raw materials in the manufacturing of new products. Any portion of the textiles that cannot yet be recycled into materials is utilized for energy production. (Kierrätys.info, n.d.)

As the responsibility for discarded textile collection is likely to be transferred to textile producers, only a limited number of collection points currently exist. This transition, driven by the proposed EPR scheme, has created uncertainty around future roles and responsibilities, discouraging further expansion of collection infrastructure. In addition to this, the costs associated with collecting

discarded textiles are significantly higher than for other waste types. Moreover, not all collected fibers have end-users at this stage, resulting in some materials being diverted to energy recovery instead of recycling. (HSY, n.d.)

At the moment, EPR is only applied to the waste management of paper, packaging waste, electrical and electronic equipment waste, batteries and accumulators, as well as car tires and end-of-life vehicles. Therefore, the manufacturer or importer of these products is responsible for the collection, recycling, and recovery of those products after use. (KIVO, n.d.) Figure 5 illustrates the current waste management system in Finland.

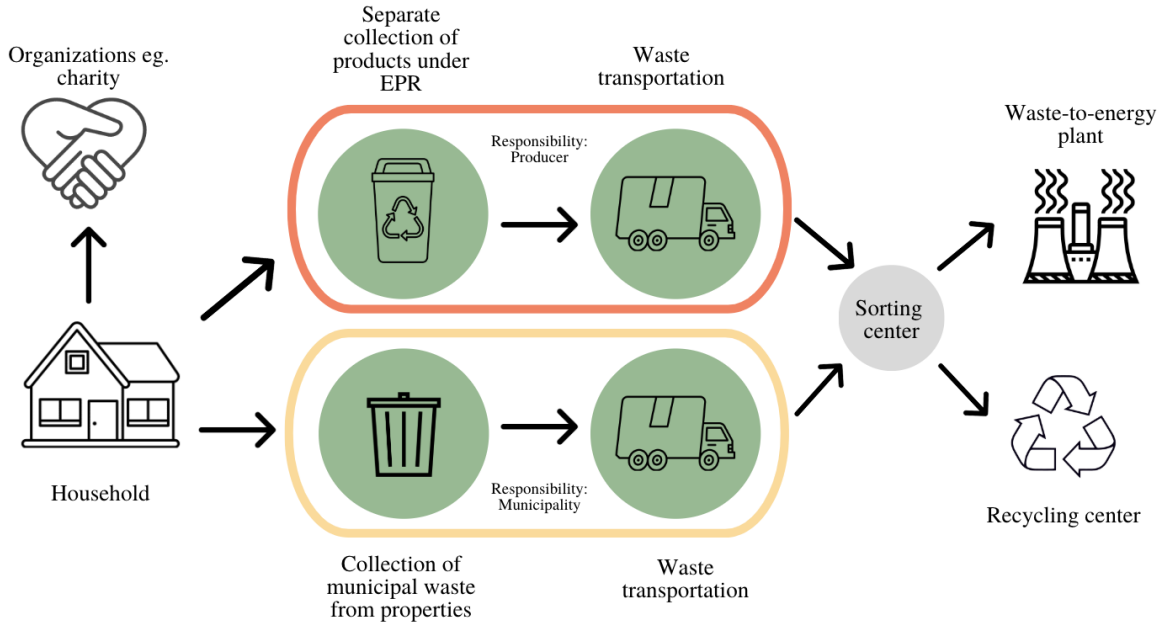

Figure 5: A simplified version of the current waste management system in Finland (own creation based on models from EY, 2023; KIVO, n.d.)

In addition, Figure 5 demonstrates how the responsibility for waste management is divided between the municipality and the producers now. However, the upcoming EPR for textiles would involve amending the waste management system to remove textile waste from the municipality's responsibility and transfer it to the producer's responsibility. The model would establish a national EPR system for textiles. (Salmenperä, 2017.) It would reduce the burden on municipalities for the physical and/or financial requirements of textile waste management (OECD, 2016).

To make it easier for companies the fulfillment of current EPR obligations is mainly handled by producer organizations. Producer organizations (PROs) are third-party entities established by importers and manufacturers to fulfil producer responsibility obligations on behalf of producer

companies. Finland has established tens of thousands of collection points for products covered by producer responsibility, including Rinki eco-points and property-based systems for packaging waste, and a national collection network for paper. These systems have been designed to maximize user convenience and increase consumer participation in recycling. (Tuottajayhteisö, n.d.) Businesses with legal obligations contribute financially to the PRO to cover the costs necessary for meeting mandated targets and outcomes. Numerous PROs currently exist for various product categories, and it is anticipated that a comparable framework will be adopted for textiles. Then businesses subject to the regulation may transfer their obligations either fully or partially to a third-party entity. (Ellen MacArthur, 2024a).

2.3.3 The role of Extended Producer Responsibility regulations in the textile industry context

The European Commission is proposing the implementation of mandatory and harmonized EPR schemes for textiles across all EU Member States (European Commission, 2023b). EPR for textiles is part of the Commission's legislative proposal of 5 July 2023 to amend the Waste Framework Directive. In the proposal textile manufacturers, importers, and distributors would be responsible for the costs of waste management, separate collection, sorting, and recycling of textile products. (European Commission, 2023a, 1-3.) In essence, the target is that textile waste would be reduced, reused, and recycled. The proposed regulations prioritize the reuse of used clothing and aim to increase the recycling of textile waste. (European Commission: Directorate-General for Environment, 2023). Also, the proposal includes guidelines to manage textile waste according to the waste hierarchy, including actions to prevent the exported waste from being disguised as reused textiles (European Parliament, 2024). Additionally, these rules provide incentives for producers to enhance product circularity through innovative design and to promote circular economy business models. The initiative aims to create local employment opportunities and expand markets for used textiles and secondary raw materials. (European Commission: Directorate-General for Environment, 2023).

On the 19th of February 2025, a provisional agreement was reached by the Council presidency and European Parliament representatives on updating the waste framework directive, with new steps to promote sustainability and lower waste generation in the textile industry. The provisional agreement introduces unified rules on EPR for textile manufacturers and fashion brands. These producers will be held accountable for their generated waste and must contribute financially to waste collection and treatment efforts with so-called eco-modulation fees. The fee will be adjusted based on the circularity and sustainability of their product designs. To reduce unnecessary textile waste and counteract the

impact of fast and ultra-fast fashion, co-legislators agreed on measures to ensure products are used for their full intended lifespan. Member states will have the option to adjust producer fees based on product durability and actual usage lifespan. The provisional agreement sets out a harmonized framework that covers all companies, regardless of size, and guarantees fair access to the resources and infrastructure required for proper textile waste management. (European Council, 2025b.)

The provisional agreement was reached in line with mandates from their respective institutions. This agreement still requires formal approval from both the Council and the Parliament and will undergo legal and linguistic checks. After adoption, member states will have a period of up to 20 months to implement the new rules into their national laws. In addition, the Commission will be responsible for reviewing and evaluating various elements of the waste framework directive, including the funding mechanisms of EPR schemes and the potential introduction of targets for textile waste by 2029. (European Council, 2025b.) The regulations will apply to all economic operators that place textile products like clothing, accessories, blankets, bed linens, curtains, hats, footwear, mattresses, and carpets, as well as items that include textile-related materials such as leather, composite leather, rubber, or plastic, on the EU market. (European Parliament, 2024).

At this stage, textile and fashion firms are in a position to begin preparing for the forthcoming final requirements. However, uncertainty remains about how the Finnish Parliament will shape the legislation once the directive is finalized and adopted. As a result, industry associations are actively advocating for their perspectives on what the legislation should address. The Finnish Textile and Fashion (STJM) emphasizes that the legislation should promote cost-effective and circular economy-supporting business models and value chains. Similarly, Fashion & Sports Commerce (Muoti ja urheilukauppa ry) highlights that EPR should cover all textile products and impose obligations on all operators, regardless of their size (Muoti ja urheilukauppa ry, 2023). These positions underline the essential reforms needed in the textile industry following the directive's implementation.

Moreover, participation in a PRO may be crucial for Finnish textile firms, as PROs serve as the central coordinating entities responsible for implementing the EPR system in compliance with legal requirements. In the early stages, it may be advisable to establish a single, monopolistic PRO to ensure stability and oversight. Once the EPR system becomes more established, a transition to a regulated, competitive PRO model could be considered. (WWF, 2020.)

The upcoming regulations around EPR for textiles are aligned with the EU Strategy for Sustainable and Circular Textiles. The European Commission aims to make the textile industry significantly more

sustainable by 2030. To achieve this, the Commission is shaping concrete actions through the EU Strategy. The EU Strategy addresses the following key areas:

- All textile products on the EU market should be durable, repairable, recyclable, largely made from recycled fibers, free of hazardous substances, and produced with respect for social and environmental standards.
- Fast fashion is becoming outdated, with consumers enjoying longer-lasting, high-quality, and affordable textiles
- Widely accessible services for profitable reuse and repair are available
- The textile sector is competitive, resilient, and innovative, with producers accountable for their products throughout the value chain, sufficient recycling capacity, and minimal reliance on incineration and landfilling. (European Commission, n.d.)

In essence, EPR is one of the main targets of the EU Strategy. The EU Strategy includes six significant key actions: 1) Ecodesign requirements 2) Stopping the destruction of unsold or returned textiles 3) Tackling microplastic pollution 4) Information requirements including a Digital Product Passport 5) Green claims for truly sustainable textiles 6) Extended producer responsibility and enhancing reuse and recycling of textiles. (European Commission, 2022).

2.3.4 General considerations of Extended Producer Responsibility frameworks

The French model serves as a relevant benchmark for understanding textile EPR in the Finnish context. France pioneered the use of EPR as a policy mechanism for addressing end-of-life textile management. Since 2007, its EPR scheme has covered clothing, footwear, and household textiles and is currently overseen by Refashion which is the country's sole PRO for textiles. Significant work has been undertaken to expand the scope of EPR in France, moving it beyond its traditional function as a financing mechanism for waste collection and sorting. (Ellen MacArthur, 2024c.) EPR is increasingly viewed as a lever for advancing circular business models, with particular emphasis on fostering reuse, repair, and recycling. Through this approach, EPR contributes to extending product lifespans and reducing premature disposal. One of the key challenges is encouraging reuse and recycling business models within France to ensure there is a local market and sufficient domestic capacity to handle discarded textiles. (Ellen MacArthur, 2024a.)

As of 2020, Refashion had 4,096 member organizations contributing a total of €36 million to the scheme. Of these funds, €17 million was allocated to sorting operators, €4 million to support local community initiatives, and nearly €1 million to innovative projects. In terms of material flow, over 517,000 tonnes of textiles were placed on the French market in 2020, with 204,000 tonnes collected, which equated to a collection rate of 39%. This represents a notable increase from the 27% rate recorded in 2013, indicating measurable progress in the scheme's effectiveness. (Innovation in Textiles, 2021.)

However, there is some disagreement among stakeholders regarding the strengths and weaknesses of the EPR framework in the Finnish context. While EPR could enhance textile collection and recycling, it has not received significant support. Therefore, the Finnish Textile & Fashion and Fashion & Sports Commerce associations have also presented their views on the EPR regulations. One of the main targets of both associations is that EPR regulations should be harmonized across the EU to the greatest extent possible. (Muoti ja Urheilukauppa ry, 2023; STJM, n.d.) A national producer responsibility scheme is seen as a threat to Finnish textile businesses (Salmenperä, 2017). Whereas harmonization may contribute to ensuring fair competition within the EU's single market, and it could even help to reduce costs (OECD, 2024). Furthermore, it is anticipated that the implementation of an EPR system would lead to a reduction in textile waste exports, primarily due to the establishment of a harmonized and centralized collection infrastructure (Salmenperä, 2017).

However, one current challenge with textile waste collection is the lack of a clear definition of textile waste. According to Ellen MacArthur (2024a), establishing shared definitions of "waste" and "product" is essential for developing effective global textile recirculation systems. Fashion is shaped by trends, sizes, climate, and subtle preferences that influence whether a piece is worn or discarded. Many items collected for reuse are still wearable but are no longer wanted. Therefore, it is essential to establish what qualifies as waste, as this directly affects the ability to determine when textile materials can be considered no longer waste. Without well-defined end-of-waste criteria, consistent and effective EPR regulation can become impossible. (The Or Foundation, 2023.)

While legal minimum sorting standards are necessary, improved sorting alone will unlikely address the core issue, which is the excessive volume of low-quality clothing. (The Or Foundation, 2023.) Therefore, the EPR schemes could try to tackle that by being designed to prioritize waste reduction first, followed by reuse and recycling, while supporting the transition to a sustainable circular economy (WWF, 2020). Some argue that although EPR could improve recycling rates, it might undermine current efforts focused on reuse. Therefore, EPR policy should clearly align with the waste

hierarchy, prioritizing waste management pathways for textiles. If EPR policies are not intended to negatively impact product reuse, the policies should be designed to specifically address and promote reuse practices whenever feasible and giving preference to textile-to-textile recycling rather than recycling for alternative purposes. (Lifset et al. 2013; Ellen MacArthur, 2024a.) However, significant and balanced investments would be required to expand separate collection, reuse, and recycling infrastructure for textiles, as well as to improve sorting systems and textile-to-textile recycling technologies. At the same time, support for circular business models, such as resale, rental, repair, and remaking, is essential, along with ensuring that infrastructure development aligns with long-term goals to reduce textile waste. (Ellen MacArthur, 2024a).

As the European Commission notes, mandatory collection targets will increase the volume of secondhand textiles, but currently, the systems both in the EU and abroad cannot absorb all of it. One potential challenge is that recycling infrastructure may not expand quickly enough to meet collection targets, and relying solely on EU facilities might be insufficient to manage the global flow of used textiles. Therefore, it is important that EPR schemes are designed to account for these challenges by supporting downstream systems where materials ultimately flow, acknowledging both the inevitability of some waste and the current limitations of reverse supply chain capacity. (The Or Foundation, 2023.) Thus, mandatory EPR can be essential for scaling a circular textile economy, ensuring that producers help fund and manage the collection, sorting, and recycling of the products they put on the market. Without EPR, there can be significant challenges in scaling systems to manage current textile volumes. Well-designed EPR policies play a key role in strengthening infrastructure, supporting job creation in reverse logistics, and enhancing the efficiency and transparency of textile reuse and recycling. (Ellen MacArthur, 2024a.)

However, the current system for collecting discarded textiles is under increasing pressure due to declining profitability, an oversupply in resale markets, and a noticeable drop in the quality of collected items, which limits their resale potential. Furthermore, limited demand for recycled textiles makes it hard to justify the cost of collection and sorting, as most worn or damaged textiles are downcycled into low-value products or end up in landfills or incinerators if facilities are available. Since the system largely relies on revenues from reselling reusable clothing, it cannot scale without structural funding to cover the full cost of managing all discarded textiles, including those with little or no market value. (Ellen MacArthur, 2024a).

Nevertheless, a strong policy regarding the coverage of the costs at every stage of the process is recommended, whether the work happens inside or outside the EU. In that way, if discarded textiles

are being transported, sorted, reused, recycled, or disposed of, the policy would recognize it and take responsibility for the impact on communities handling exported materials. (The Or Foundation, 2023.) Additionally, the EPR proposal suggests allocating some funds to developing fibre-to-fibre recycling systems. The challenge with that is that the proposal does not sufficiently address overproduction, which is a major driver of the textile industry's waste crisis. Fibre-to-fibre recycling may play a role in advancing sustainable resource management in fashion. However, the fundamental issue is the global oversupply of clothing. (The Or Foundation, 2023.)

Furthermore, it would be beneficial for the EPR to apply to all actors, regardless of their size (Muoti ja Urheilukauppa Ry, 2023). However, according to the Finnish Textile & Fashion (STJM, n.d.), responsibility should be based on the volumes introduced to the market rather than having company-specific volumes. In addition, it is essential that the legal framework defines clearly which actors are considered "obligated producers" and are legally required to fulfil the objectives and targets established by the EPR policy (Ellen MacArthur, 2024a). This is crucial to ensure that all products placed on the market are included, whether they originate from local companies, importers, or online retailers (Eunomia, 2022), and efficient EU-level market surveillance should be ensured (STJM, n.d.). The following Table 2 presents additional key considerations that complement the previously discussed elements related to the implementation and effectiveness of EPR in the textile sector.

Table 2: Additional key considerations of implementing the EPR in textiles

Subject	**Description**	**Reference**
Business and investment opportunities	EPR can increase investment and create new business opportunities as broader recycled material flows become known. This may encourage cleaner production processes, sustainable product design, and more efficient use of natural resources and materials.	Salmenperä (2017), OECD (2016)
Infrastructure Development	EPR encourages capital investment in the infrastructure required for large-scale reuse and recycling.	Ellen Macarthur (2023)

Transparency and tracebility	EPR can enhance transparency and improve the traceability of material flows across global supply chains.	Ellen MacArthur (2023), OECD (2016)
Proven effectiveness	EPR schemes have proven effective in enhancing waste management for various products, including packaging, batteries, and electronic equipment.	European Commission (2023b)
Administrative burden and simplification	EPR might introduce additional administrative responsibilities for stakeholders. However, EU-level classification systems, a granular fee structure, and standardized reporting can ease the burden, improve compliance, and enhance overall effectiveness.	Salmeperä (2017), Eunomia (2022)
Challenges for reuse activities	EPR may create challenges for running reuse activities effectively.	Salmeperä (2017)
Policy alignment and complementary regulations	EPR frameworks should be integrated with existing policy tools, such as bans, taxes, product standards, labeling, public procurement, to maximize environmental impact. EPR can be a valuable policy tool to reduce textile waste, but it success might depend on additional regulations, such as legally binding ecodesign regulations. However, the criteria for eco-modulation should be	Ellen MacArthur (2024b), STJM (n.d.), WWF (2020)

	clearly defined to ensure consistency with the goals of the Ecodesign for Sustainable Products Regulation.	
Legal and transitional clarity	Adequate transition periods and respect for the principle of non-retroactivity must be ensured to maintain legal certainty and fairness for stakeholders.	STJM (n.d.)
Global reuse market potential	From an environmental standpoint, one of the most desirable outcomes of an effective EPR policy would be a strong global reuse market. Achieving this, however, requires a clear understanding of how the market functions in practice.	The Or Foundation (2023)

Table 2 provides a concise summary and clear overview of the additional key considerations related to EPR, serving as a transition to the final section of the literature review. With the core literature now presented, the next chapter will demonstrate how these insights contribute to the development of the study's theoretical framework.

2.4 Conceptual framework of the study

The purpose of this chapter is to summarize the literature review and establish a preliminary conceptual framework. This framework draws on key concepts identified in earlier research on sustainability issues, circular business models, and Extended Producer Responsibility. According to Jabareen (2009), a conceptual framework is a structured network of related concepts designed to deliver an integrated understanding of a phenomenon or multiple phenomena. In general, a conceptual framework helps to illustrate and clarify the central topics of the study and their assumed interconnections. It supports the identification of key concepts and provides a structured overview of what is being examined (Miles & Huberman, 1994, 20–21).

To address the main research question, "How is Extended Producer Responsibility for textiles expected to impact Finnish textile firms?", it is significant to understand the affecting factors on

different stakeholders' perspectives and the current state of the textile industry and the dominant views of the industry players. The initial conceptual framework (Figure 6) provides an overview of the phenomenon and provides a better understanding of the underlying factors affecting the expected impacts of EPR for the Finnish textile field.

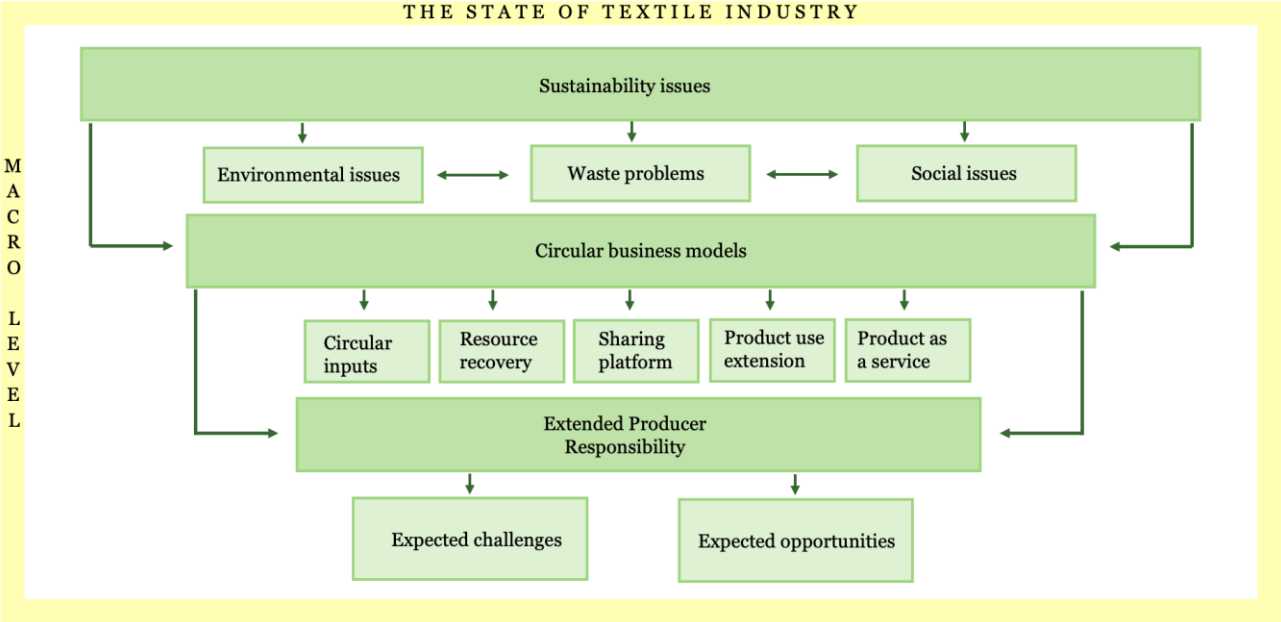

Figure 6: Initial conceptual framework enabling data collection and analysis

The initial framework is developed by combining several key elements drawn from the literature. It illustrates the macro-level perspective of the research question by identifying the primary drivers behind the need for EPR. To fully explore the anticipated impacts of EPR, it is essential to understand its background and historical development. The framework is visually represented as an inverted triangle to emphasize how sustainability challenges, particularly the growing issue of textile waste, serve as the main driving force for regulatory change. The side arrows illustrate the connection between the topics. In the literature, circular business models are often suggested as solutions to sustainability challenges, while EPR is presented as a concrete policy tool that supports the shift toward a more circular textile industry.

Sustainability serves as the overarching theme influencing all aspects of the study. In particular, environmental and social impacts significantly affect both planetary health and human well-being (United Nations Environment Programme, 2023). Given that the current situation is not aligned with the United Nations Sustainable Development Goals (SDGs), there is an ongoing need for systemic change (UNEP & UNFCCC, 2023). Within the context of textiles, waste generation stands out as one

of the most pressing concerns (European Environment Agency, 2024a). For this reason, it is highlighted separately within the sustainability framework. Moreover, the arrows connecting the subtopics under the sustainability category illustrate that the issue of textile waste is closely intertwined with both environmental degradation and social challenges.

Whereas the CE framework (Stahel et al. 2019; Ellen MacArthur 2019, Lacy et al. 2020) provides the foundation for understanding how EPR policies aim to transform the textile industry by promoting circular business models, waste reduction, and sustainable material use. It presents alternative circular business models that could be further promoted in the textile industry (Ellen MacArthur, 2024a; Lacy et al. 2020), which are presented as subtopics under the circular business models category. Furthermore, the literature review provides a detailed overview of circular strategies, which are compared to the approaches already adopted by some textile companies.

Advancing the circular economy has become a key policy priority for the European Commission (Köhler et al. 2021). Furthermore, several upcoming policy measures aim to transition the European Union toward more sustainable and circular practices, with the European Commission targeting a significantly more sustainable textile industry by 2030. EPR forms a key section of the EU Strategy for Sustainable and Circular Textiles (European Commission, 2022). The forthcoming EPR scheme is intended to accelerate the development of textile collection, sorting, reuse, and recycling systems, thereby addressing the sector's growing waste challenges (European Commission, 2023b).

In the literature review, the concept of EPR is introduced to clarify its meaning and relevance. To provide a broader context, the current textile waste management system is also presented, forming the foundation for understanding the rationale behind the upcoming EPR policy. The final sections of the literature review focus on the expected challenges and opportunities associated with EPR, which directly support the study's main research question by exploring its anticipated impacts on the textile industry. For this reason, general considerations and background on EPR have been included in the review. After reviewing the relevant literature, the next chapter presents the study's research methodology.

3 Methodology

This chapter presents the methodology used to conduct the study and address the research questions. It explains the selection of a qualitative research approach and provides a justification for this choice. The chapter also outlines the empirical part of the study, including the research design, data collection methods, and data analysis process. Finally, it evaluates the trustworthiness of the research and discusses the ethical considerations.

3.1 Research approach

A qualitative research approach was selected to examine the expected impacts of Extended Producer Responsibility on Finnish textile firms. Currently, only limited prior knowledge and data are available on the topic, and the precise effects remain uncertain. This makes a qualitative approach appropriate, as it emphasizes interpretation and gaining a deeper understanding. In contrast, quantitative approaches emphasize explanation, hypothesis testing, and statistical analysis, which is not an optimal method for this study. In addition, qualitative research is beneficial when there is limited existing knowledge about a phenomenon, as it is exploratory and adaptable, making it well-suited for addressing less-defined problems (Ghauri & Grønhaug, 2005, 202). Furthermore, quantitative research typically employs structured, standardized methods for data collection and analysis. In contrast, this study involves a deliberately selected sample of human participants, making qualitative research a more suitable approach. In qualitative research, data collection and analysis are context-sensitive, striving to achieve a comprehensive and holistic understanding of the issues being examined. The qualitative research method provides a way to explore, critically examine, and reflect on real-world phenomena. (Eriksson & Kovalainen, 2008.)

As defined by Eriksson & Kovalainen (2008, 5), the main qualitative methodologies in business studies comprise action research, case study research, discourse analysis, ethnography, grounded theory, and narrative inquiry. In this study, an Extended Case Method (ECM) approach is applied. The ECM is a research strategy that focuses on context-driven, case-based analysis (Nguyen & Tull, 2022). The ECM uses reflexive science within ethnography to derive general principles from unique cases, bridging the "micro" and "macro" levels, linking the present to the past, and anticipating the future. This is achieved through the foundation of pre-existing theory. (Burawoy, 1998, 5.) The micro level refers to the specific events, actors, or social entities chosen for study, where clear analytical boundaries enable the collection of directly observable data. In contrast, the macro level encompasses the broader, less immediately visible contexts, such as social, cultural, institutional, and political

systems, that influence and shape the research phenomenon. (Nguyen & Tull, 2022). Furthermore, reflexive science emphasizes engagement with the world studied, guided by theory as a tool for understanding. It relies on dialogues between researchers, participants, broader contexts, and evolving theories, aiming to advance knowledge by refining theory to address anomalies. (Polanyi, 1958; Burawoy, 1998.)

In order to create novel theoretical insights, the researcher designs the study in a way that explicitly considers the dynamic nature of macro-level contexts in explaining cases. This means recognizing the analytical and explanatory value of context and collecting data across different locations and levels of complexity. The aim is to enable theory development that deepens the understanding of cases and contributes both empirically and theoretically. (Nguyen & Tull, 2022.) Furthermore, ECM emphasizes generating detailed and comprehensive knowledge by analysing multiple context-rich data sources. (Burawoy, 1998; Tellis, 1997.) It emphasizes an iterative interaction between empirical data and theory, offering a structured yet adaptable framework for exploring emerging phenomena. (Burawoy, 1998, 23.) The ECM uses the cases to explore and improve broader theories or frameworks (Burawoy, 1998). In general, case methods are recognized for their effectiveness in explaining complex and challenging business problems in an approachable, vibrant, personal, and relatable manner (Eriksson & Kovalainen, 2008).

The ECM enables the observation of micro-level responses to macro-level phenomena within a specific contextual setting. This approach makes it easier to identify the broader structural forces that drive contextual changes and to analyse how these forces shape local adaptations at the micro level. Through the integration of micro and macro dynamics, the method provides a holistic view of the phenomenon, bridging past and present with a forward-looking perspective, and it is grounded in established theoretical frameworks. (Burawoy, 1998, 5.) The macro-level context has already been addressed in the theoretical backround (Chapter 2), while the micro-level insights will be presented in the findings (Chapter 4). In the subsequent discussion chapter, these micro-level observations are integrated with the macro-level framework to explore the emerging phenomena holistically. This approach enables a holistic understanding of the phenomenon by considering both the experiences of individual actors and the wider societal structures in which they are embedded. Such a micro–macro linkage is a central feature of the ECM, which aims to refine or extend theory through empirical observation. (Burawoy, 1998.)

However, the impacts of the EPR on Finnish textile firms remain uncertain, as the final form of the regulations is still subject to change. Additionally, it is unclear how the Finnish government will

implement the directive into national legislation, which will ultimately determine the adjustments companies must make to their business practices. The ECM is well-suited for this study, as the aim is to identify the expected opportunities and challenges posed by the forthcoming EPR regulations. In other words, a clearly defined case does not yet exist for in-depth examination. As a result, the ECM was identified as the most suitable approach for this study, as it enables a comprehensive understanding of the phenomenon by revealing which macro-level forces are driving change and how these are interpreted and adapted at the micro level.

3.2 Data collection

Qualitative research includes various methods for gathering data, including press releases, statistics, newspaper articles, and interviews (Eriksson & Koistinen 2014, 30–31). In this study, interviews were chosen as an appropriate method, as they are commonly used as a method for collecting data in qualitative research to facilitate purposeful interactions for gathering insights from individuals. This approach is especially useful for exploring complex topics, obtaining detailed explanations, and engaging in in-depth discussions for comprehensive analysis. (Eskola & Suoranta 1998, 60–64; Sahoo 2022, 2–3.) Due to the complex nature of EPR in textiles, this method is well-suited for this study, as it provides in-depth qualitative insights into its opportunities and challenges, allowing for a more comprehensive understanding of the topic. To understand the research question, “How is implementing Extended Producer Responsibility expected to impact Finnish textile firms?”, qualitative data was gathered through semi-structured interviews due to their balance of structure and flexibility.

In general, interviews can be categorized into open, structured, or semi-structured formats. (Eskola & Suoranta 1998, 60–64.) Interviews are common in business research, but limitations may arise concerning the evidence they produce (Eriksson & Kovalainen, 2008). For instance, Arvey and Campion (1982) note that while structured interviews generally offer greater reliability than unstructured formats, they may also shape or limit how participants respond. However, for this study, semi-structured interviews were selected since, while open discussion was desired, the main purpose was to get answers to certain factors that arose from the existing literature. The semi-structured approach provided valuable flexibility, allowing for effective engagement with the study’s diverse stakeholder groups (Hirsjärvi et al. 1997, 201). Semi-structured interviews involve asking participants the same set of questions in a consistent order, with the flexibility to introduce additional questions based on different thematic areas. Despite this structure, participants are encouraged to respond freely as the questions are intentionally open-ended. (Gubrium et al. 2012). This indicates that participants

are not guided to provide predetermined responses to specific questions. As a result, each participant offers unique but comparable insights, which are essential for understanding the research question.

A significant aspect of qualitative research is to provide a detailed description of the interview process (Eriksson & Koistinen 2014, 30–31.) In addition, Tuomi & Sarajärvi (2018) highlight that interviewers cannot simply choose interview questions randomly. Therefore, the interview questions (Appendix 1) were formulated using the operationalization table (Appendix 2) that was created based on the research questions and existing literature. In this context, operationalization connects the theoretical framework to real-world scenarios by ensuring that the research question and sub-questions align with the underlying theory (Eskola & Suoranta, 1998, 75). Additionally, acknowledging the importance of pretesting interview questions, as they remain fixed once the actual interviews begin (Gubrium et al. 2012), a pilot interview was conducted with Apparel Company A. Since the questions proved effective, the data from the pilot interview were included in the research analysis.

A total of eight informants attended the interviews. Two of those contacted were unavailable to attend due to busy schedules, and three did not respond. The process of selecting informants for a study should emphasize individuals with significant expertise and familiarity with the researched phenomenon (Tuomi & Sarajärvi 2009, 85). Accordingly, the informants had a strong professional background in the Finnish textile industry and substantial knowledge of sustainability issues in the sector. Four of the informants work for apparel companies with operations in Finland, each participating in global markets, while the remaining three represent organizations focused on second-hand fashion, textile recycling, and industry-wide collaboration. The primary criterion for selecting interviewees in this study was their expertise in sustainability and their understanding of organizational strategy. To gain more truthful and balanced insights, participants were intentionally selected from a range of organizations to capture diverse perspectives. As a result, their job titles varied, though most held managerial positions. Table 3 presents the titles and affiliated organizations of the selected informants, along with the duration and language of the interviews conducted. In accordance with ethical research standards and to ensure the confidentiality of informants, this study does not reveal their names or the organizations they represent.

Table 3: Overview of the informants' backgrounds and further specifications of the interview

Organization	Description	Informant	Duration	Language
Apparel Company A	Outdoor & Sports brand	Sales Manager	31 min	Finnish
Apparel Company B	Fashion brand	Production Manager	56 min	Finnish
Apparel Company C	Lifestyle brand	Circularity Coordinator	53 min	Finnish
Apparel Company D	Fashion brand	CEO	35 min	Finnish
Apparel Organization F	Second-hand and sustainable fashion retailer	Communications Manager	37 min	Finnish
Waste Management Company	Circular economy and textile recycling organization	Project Manager	38 min	Finnish
Industry Association A	Textile industry association	Chief Advisor	43 min	Finnish
Industry Association B	Textile industry association	CEO	49 min	Finnish

All informants were contacted via email by the researcher with an invitation to participate in the study. The cover letter email (Appendix 3) provided an overview of the research topic, sub-questions, and interview questions, along with a privacy policy notice. This study primarily employed an individual interview approach, enabling each session to concentrate on a single participant for an in-depth discussion of the phenomenon under investigation. The selection of interviewees was guided by the need to complete the study effectively within the given time constraints. Furthermore, in qualitative research, the number of observations may be limited, as the focus is on gaining deep and detailed insights (Ghauri 2020, 98).

Additionally, reaching saturation was considered in deciding the total number of interviews. Saturation occurs when interviewees no longer provide new or relevant information within the study's scope in qualitative research (Tuomi & Sarajärvi, 2009, 87). In this study, saturation was reached

after eight interviews, as no new insights regarding the possible impacts of EPR emerged. It is worth mentioning that in two interviews, the informants collaborated with other managers in their organizations to prepare their responses, ensuring comprehensive answers and multiple perspectives. However, according to Eisenhardt (1989, 545), notes that although the added value of including more cases becomes marginal, but selecting 4 to 10 cases is typically justified, especially considering resource constraints.

All the interviews were conducted between January and March 2025. Six of the interviews were conducted via the Zoom video platform, enabling video-based discussions and creating a comfortable setting for open dialogue. The remaining two interviews were held in person, providing a similarly calm and conducive atmosphere for dialogue. With the consent of all informants, the interviews were recorded for transcription purposes. All interviews were conducted in Finnish, with their duration ranging from approximately 30 minutes to one hour, which can be seen in Table 2. The collected data were stored on the researcher's cloud platform, with a decision to delete them one month after the study's completion. Furthermore, primary data served as the foundation for the data analysis. Although the ECM may also incorporate secondary data (Burawoy, 1998), this study relied on primary data for the analysis. This decision was based on time constraints as well as the depth and quality of the primary data collected.

3.3 Data analysis

Qualitative analysis aims to make complex data more manageable without losing its significance, while enriching its meaning by identifying key themes and the logic that connects them. (Eskola & Suoranta, 1998, 100.) In addition, the purpose is to interpret, structure, and make sense of the collected data to support the development of answers to the research questions (Hirsjärvi et al. 2004, 209–211.). As per Eriksson & Kovalainen (2008), empirical case data should be structured thematically or chronologically within a case record. Thematic analysis was selected as the analytical approach for this research. Thematic analysis helps researchers spot and understand key themes in qualitative data, linking them to research questions in an interpretative way. It is regarded as one of the most critical stages in the research process and contains several key steps, including organizing and categorizing the data, combining different insights, and clarifying the most relevant aspects to uncover meaningful patterns and connections. (Hirsjärvi et al. 2004, 209–211.)

Thematic analysis was chosen for this study due to its effectiveness in examining the research phenomenon and its adaptable approach to handling and interpreting qualitative data. One key reason for using thematic analysis was its versatility, as it does not require alignment with any fixed

theoretical framework. This makes it suitable for different research questions and data types, such as interviews conducted in person or remotely. (Braun & Clarke, 2014.) As described by Braun & Clarke (2017), thematic analysis provides structured and user-friendly methods for generating codes and themes from qualitative data. A theme refers to a meaningful element that emerges from the data and holds relevance to the research question. It reflects a pattern found within a specific dataset. Given that qualitative data often contains multiple and diverse themes, it is the researcher's responsibility to assess which of these are most related to the study's aims. Importantly, the significance of a theme is not determined by how frequently it appears, but by how strongly it relates to the central research question. (Braun & Clarke, 2006, 79–82.)

The identification and formulation of themes, known as thematization, was a key element of the research process. A systematic process was followed throughout the data analysis phase to maintain a clear and rigorous analysis. This involved identifying relevant segments within the data, reviewing and tagging them based on defined themes, and then organizing the material into meaningful categories. Thus, the themes were generated based on the interviewees' answers. This phase also allows researchers to examine whether the data aligns with or deviates from existing theories (Eriksson & Kovalainen, 2008). Ultimately, the findings were summarized to reflect the core insights aligned with the study's research questions.

First, the theme of business readiness and awareness of EPR was identified separately, as it provided a valuable foundation for analysing the current state of sustainability and the development of circular business models within the Finnish textile industry. Then the rest of the raw data was organized through thematic networks. Thematic networks provide a web-like structure that helps organize and represent the data. They also make the steps from raw text to interpretation more transparent and easier to follow. Through a structured process, thematic networks help extract meaning from qualitative data by identifying *Basic Themes* (specific points from the text), grouping them into *Organizing Themes* (categories that reflect broader ideas), and finally summarizing them into *Global Themes*, which convey the main underlying narratives or patterns. As illustrated in Figure 7, these themes are shown as web-like maps that display the key themes at each of the three levels and show how they are connected. The aim of thematic networks is not to trace arguments to their source or ultimate conclusions, but to offer a structured way of analyzing text by identifying clear justifications and interpreting the deeper significance behind them. (Attride-Stirling 2001, 388.)

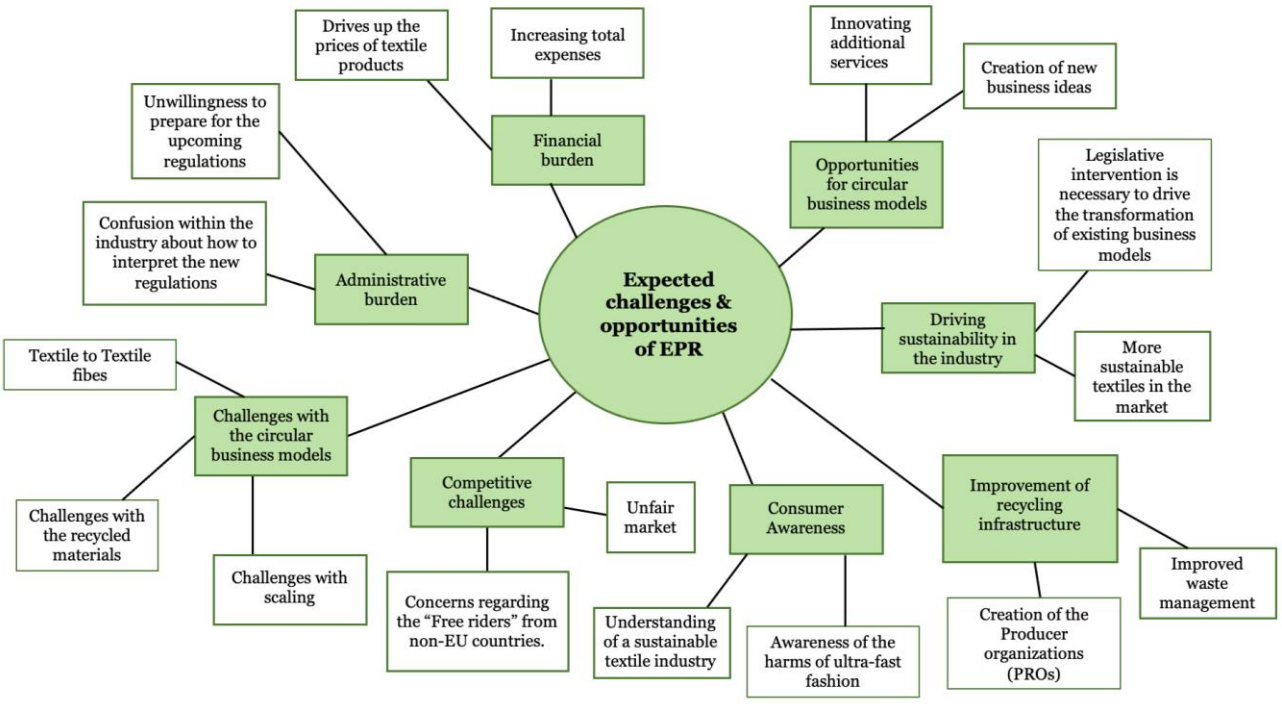

Figure 7: Thematic networks constructed for the study's main themes

The construction of the thematic network began with the identification of basic themes (represented as clear boxes), which were then grouped into organizing themes (green boxes). These organizing themes were subsequently clustered under a single global theme (green circle), forming a network-like structure that visually illustrates the relationships between the themes (Figure7). In general, thematic networks are shown as web-like diagrams to avoid suggesting any strict hierarchy. This format gives the themes a sense of flow and highlights how they are all connected. However, it is crucial to highlight that the network itself is just a tool to support the analysis and not the analysis itself. Once created, the network helps organize the interpretation of the text, making it easier for the researcher to uncover insights and for the reader to understand the findings. (Attride-Stirling 2001, 390.)

The data analysis was carried out carefully during and after the interviews. Once all eight interviews had been conducted, they were transcribed thoroughly to provide a detailed record for the later stages of analysis (Kananen 2014, 102). Furthermore, the transcripts were carefully read through, categorized, and prepared for further analysis. Once the interviews were transcribed and prepared, the researcher carefully reviewed the 91 pages of transcribed text and engaged with the content to deeply understand the material. The data was reviewed multiple times in an active and engaged manner to develop a comprehensive understanding and identify recurring themes (Braun and Clarke,

2006, 87). After careful consideration, the final analysis was conducted by categorizing manually the interview data under the thematic networks and the theme of business readiness and awareness of EPR. Additionally, the global theme was eventually divided into two categories (chapter 4.2.1 and 4.2.2) to enhance the clarity and readability of the analysis for the reader.

Thematic development followed an inductive process, with all themes grounded in the data rather than guided by prior assumptions. The initial development of themes began already during the planning of the semi-structured interviews, guided by the theoretical framework. These interview themes later formed the basis for the analysis. An initial thematic map was created based on Braun and Clarke's (2006, 90) approach, presenting both themes and sub-themes. In the final stage, the themes were examined to ensure they were consistent, coherent, and clearly separate from each other. In the final step, the material was reviewed once more to ensure that all significant elements were captured.

3.4 Evaluation of the study

3.4.1 Trustworthiness of the study

The evaluation of the trustworthiness of this study aligns with the suggestions outlined by Lincoln and Guba (1985). According to Lincoln and Guba (1985), the trustworthiness of qualitative research involves aspects of *credibility, transferability, dependability, and confirmability.*

Credibility relates to internal validity and reflects the extent to which the findings accurately represent reality. Methods such as prolonged engagement, detailed observation, and triangulation help to ensure credibility. (Lincoln & Guba, 1985, 296–307.) Shenton (2004) defines credibility as ensuring a study accurately measures or tests what it is supposed to. The author suggests enhancing a study's credibility by gaining prior knowledge of the organization under study for better familiarity, using triangulation, making sure that participants are willing and feel secure enough to provide necessary details, and ensuring reliable data collection and interpretation (Shenton, 2004, 64–68). To ensure credibility, the researcher developed an understanding of the organizations from which the informants came and confirmed the voluntary participation of all interviewees. Additionally, triangulation was also considered in this study and was achieved by cross-checking and validating the information provided by the interviewees. The researcher employed multiple theoretical perspectives and data sources to strengthen the trustworthiness of the findings (Ghauri, 2020, 149). Furthermore, as this is a qualitative study, a certain degree of triangulation is inherently present throughout the research process.

Meyer (1977, 345) suggests that interviews are an effective way to ensure that data accurately reflects the issue being studied, as it allows for further search of any unclear responses during the interview process. Eskola and Suoranta (1998, 50) argue that relying on a single data source can result in a biased perspective of events, therefore using triangulation can enhance the trustworthiness of the research. Furthermore, Eisenhardt and Graebner (2007, 28) share a similar viewpoint since they recommend that gathering data from various sources, including several interviewees or alternative sources, enhances the credibility of the research. Eskola and Suoranta (1998, 155) state that the data gathered should be relevant to the study, and reaching saturation is a sign that an adequate amount of data has been obtained. While interviews served as the primary data source for this study and data saturation was reached, the researcher also closely monitored ongoing news coverage related to the topic and regularly consulted reports from the EU and relevant industry associations. In other words, the researcher had engaged with the subject matter over an extended period, building a strong contextual understanding to support the analysis.

According to Lincoln & Guba (1985, 290-291), *transferability*, which corresponds to external validity, refers to how well the findings can be applied to comparable situations. This requires the researcher to link research outcomes to existing literature and to different contexts or groups (Shenton, 2004, 69). Shenton (2004) argues that due to the nature of qualitative case studies, applying their findings to different contexts may prove difficult since they typically focus on specific events. Therefore, the aim of assessing transferability in such studies should not be to analyze the extent of transferability as such, but rather to concentrate on providing thorough descriptions of how the study was conducted. This approach enables readers to judge for themselves the applicability of the results to other situations. Eriksson and Koistinen (2014) note that case studies often face criticism for the challenges associated with transferring their findings to other contexts. The authors explain that the primary goal of case studies is not necessarily to ensure transferability but to provide a detailed representation of specific cases, thereby enhancing the understanding of events. In this study, the research context, approach, and methodology are described in detail. The findings aligned with existing literature, which further strengthens the study's transferability. Furthermore, a key element of transferability is providing a clear account of the data collection and analysis procedures, as this allows others to potentially replicate the study and assess the reasoning behind it (Ghauri, 2020, 134).

Dependability relates to the concept of reliability and reflects the extent to which the research process has been systematically and transparently documented (Lincoln & Guba 1985, 300). Dependability involves the capacity for other researchers to replicate the study using the same interviewees and questions and achieve comparable conclusions. Therefore, dependability is closely linked to

repeatability. To achieve such dependability, the research design and findings must be meticulously documented and detailed. (Shenton, 2004, 71–72.) In this study, dependability was increased by providing details about the participants, the research methodology used, the interview questions, and the data analysis process in this study. As a result, it may be concluded that sufficient detail has been included to allow other researchers to repeat the study if desired.

Confirmability refers to the objectivity of the study, indicating the extent to which the findings are shaped by the data rather than by the researcher's personal biases or interpretations (Lincoln & Guba 1985, 300-324). The objective of the research is to get results that accurately reflect the situation under study and are not influenced by the researcher's personal opinions. Therefore, confirmability is linked to the already mentioned concepts of reliability and dependability. Confirmability can be supported by using triangulation, specifying the research methodology used, and acknowledging any assumptions held by the researcher, if there are any. (Shenton, 2004, 73.) But Eskola and Suoranta (1998) note that eliminating subjectivity from qualitative research is not possible. Therefore, they argue that detailing the logic behind the data collection and analysis is crucial to enable readers to assess the objectivity of the study. In this study, the research methodology was described thoroughly.

The findings of this study were grounded in a thematic analysis of the interview transcripts, which were read multiple times to ensure familiarity with the data. Thematic networks were then identified, and all interpretations and conclusions were drawn directly from the material and not influenced by the researcher's personal biases or perspectives. This systematic and transparent approach to analysis enhances the confirmability of the research by making the reasoning behind the research design and conclusions traceable and clear (Nowell et al. 2017, 3).

3.4.2 Ethics of the study

The study followed ethical research guidelines and the principles of responsible scientific conduct. According to Eriksson and Kovalainen (2008), maintaining high ethical standards is essential throughout the entire research journey. It is important to reference sources accurately, include a variety of perspectives, and consider ideas that go against the majority view to keep the research balanced and thoughtful. Therefore, the researcher carefully included a range of perspectives and cited the sources properly. Efforts were also made to include viewpoints that challenged the main or widely accepted ideas.

Since the interviews were recorded, ethical considerations were essential to maintaining research integrity. During the interviews, particular attention was paid to ethical matters. Following Hewitt's

(2007) guidelines, the researcher focused on being transparent about potential bias, creating a respectful and trustworthy environment, avoiding harm or misuse of information, and protecting participants' rights and privacy throughout the process. Additionally, core principles of research integrity include reliability, honesty, respect, and accountability (Finnish National Board on Research Integrity TENK, 2023, 12). Research integrity and ethical practices were ensured by obtaining the necessary permissions, distributing informed consent forms (Appendix 4) to all participants before data collection began, anonymizing both individual and organizational information, and following proper procedures for ethical oversight. In addition, according to Ghauri (2020, 24), researchers should try to find true and accurate answers. Reflecting on this principle helped ensure that the study was conducted with transparency and ethical awareness from beginning to end.

According to the Finnish National Board on Research Integrity (TENK, 2023, 14), research data should be managed, stored, and used responsibly. Throughout the study, all procedures complied with the General Data Protection Regulation (GDPR). Participants were informed in advance that their responses would be anonymized and that the interviews would be audio recorded. Prior to the interviews, they were also given an overview of the interview content by receiving the interview questions. Additionally, the analysed data were made available to participants upon request before the publication of the study. This practice strengthens the ethical integrity of the research by giving participants the opportunity to review how they are represented in the findings. Furthermore, Eriksson and Kovalainen (2008) emphasize that participant validation of the researcher’s interpretations enhances the study’s overall credibility and trustworthiness.

In the interest of transparency, AI (ChatGPT) was used to support grammar refinement, language proofreading, and assistance in locating academic references. However, all research, analysis, and development of theoretical frameworks were independently conducted by the researcher. In other words, the content was created entirely by the researcher. All in all, the study follows ethical research principles by promoting openness and critical inquiry while striving to reduce any possible negative effects on participants. After evaluating the study’s trustworthiness and ethics, the next section will explore its key findings. After outlining the research methodology, the next chapter will present the key findings from the empirical study.

4 Findings

In this chapter, the key findings are outlined to provide insight into the research question. It begins with an overview of the Finnish textile industry's readiness for EPR and its current level of awareness regarding the policy. The chapter then explores the core research question "How is Extended Producer Responsibility for textiles expected to impact Finnish textile firms?" by examining the anticipated challenges and opportunities EPR may present. The findings are accompanied by interview quotations that help illustrate and support the analysis. To ensure the anonymity of participants, all names and organizational affiliations have been anonymized in the presentation and discussion of the data.

4.1 Business Readiness for Extended Producer Responsibility

Before delving into the findings directly linked to this study's research question, it is essential to first examine the role of sustainable & circular practices within the participating organizations. Accordingly, the initial key findings of this study, which are closely tied to the research question, pertain to the organizations' existing circularity practices and their awareness of the EPR textiles. All informants acknowledge the presence of sustainable and circular practices within their organization's business model. They also demonstrated awareness of the circular strategies already being adopted by Finnish textile companies that may ease the transition to the upcoming EPR laws.

The majority of informants indicated that Finnish textile firms are familiar with recycled materials and have integrated them into select products. However, these materials primarily consist of recycled PET plastic (rPET), replacing only a portion of virgin materials. While informants recognized the need to shift towards textile-to-textile recycling, they emphasized that while such fibers are of growing interest, they remain highly challenging to implement. Although informants from apparel companies noted that Finnish textile firms still primarily rely on virgin materials, such as virgin cotton and polyester, many strive for sustainability by ensuring their products are long-lasting, durable, and timeless. Many of them prioritize ensuring high-quality textiles.

The Chief advisor of Industry Association A (20.01.2025) offered the following reflection on Finnish textile firms' approach to their products:

> *"Well, actually, quality has always been the thing that Finnish companies are recognized for. And a lot of effort has been put into ensuring that the products are high-quality so that they can withstand both regular use and maintain their appearance over time."*

Some informants from apparel companies shared similar views, emphasizing their goal of designing and creating products that stand the test of time. Additionally, they prioritize the use of durable

materials to ensure garments can be passed from one person to another, extending their lifespan. The Production manager of Apparel Company B highlighted that while design remains the top priority, they consistently choose the most durable option for each product. This mindset naturally leads them to invest in material selection, ensuring the longevity of their products. In addition, upcycling has generated interest in a few Finnish textile companies, but most of the companies still perceive it as a relatively unfamiliar concept. According to the Chief Advisor of Industry Association A, upcycling can serve as an alternative to replacing virgin materials. Some large companies are already partnering with emerging designers to explore the upcycling potential of their used products, particularly those made from high-quality, durable materials.

All of the informants recognized the challenges of textile waste and agreed that changes should be made to virgin material production. For instance, the Communications Manager from Apparel Organization F (12.02.2025) outlined the issue as follows:

> *"Reusing is always the primary priority, and we strive to promote it as much as possible. Producing textiles as raw material is also a good option, but from an environmental perspective, reuse is always the better choice."*

However, while most products are still made entirely from virgin materials, many informants noted that some Finnish companies are considering the afterlife of their products by implementing take-back systems or partnering with organizations that resell used clothing. Additionally, a growing number of Finnish companies now offer repair services or related solutions to extend product lifecycles, such as fabric patches for mending garments. Some informants described the methods for extending the product lifecycle as follows:

> *"We also have fabric patches, of course. They can also help extend the lifespan of clothing. For example, if a pair of sweatpants gets a hole in the knee, even someone without sewing skills can easily fix it with a fabric patch. Just stick it on, and the pants are good to go again". (CEO, Apparel Company D, 20.02.2025)*

> *"We have been able to practice this extended producer responsibility a little bit. We have this reuse system in place, where we collect and resell products, and the sorting process has been developed to maximize the value of the incoming items. The goal is to sort them in a way that allows for the highest possible reuse or repurposing. In this context, the waste management company stepped in at the right time as one of the end-of-life solutions for the products." (Circularity Coordinator, Apparel Company C, 19.02.2025)*

All in all, Finnish textile companies acknowledge various ways to address waste challenges, with small innovators showing particular interest. However, most of the informants remain somewhat sceptical of the current methods.

Nevertheless, the Chief Advisor of Industry Association A emphasizes that most Finnish textile and fashion companies are aware of the EPR proposal and the upcoming regulations. This is consistent with the findings, as all informants reported being aware of it to some extent. Yet, many informants pointed out that smaller textile firms are likely less informed about EPR regulations compared to larger companies. This observation is supported by the data, as informants from smaller companies demonstrated less familiarity with the concept than those from larger organizations. Companies view industry associations and publications as highly important sources of knowledge. However, many find EPR confusing and still somewhat unfamiliar. Some Finnish textile companies believe that this policy will not apply to them and, as a result, show little interest in it.

> *"And I'm also fairly well aware of the producers' reluctance to take any proactive steps (regarding EPR). For the past year or two, I've been trying to push the idea that maybe we could start learning about this together—that we've already done a million things wrong, so perhaps we could give some guidance on what not to do. That way, the transition could be somewhat smoother if we shared this knowledge. But there has been no response." (Project Manager, Waste Management Company, 24.02.2025)*

> *"So we are quite well prepared for it since we already know quite a lot about it. But I also understand that for these smaller companies compared to us, it's more of a resource issue. But that's usually how it goes—things get done when there are no other options left." (Sales Manager, Apparel Company A, 14.01.2025)*

Therefore, based on the informants' insights, smaller companies, especially, have not taken any steps to prepare for EPR in textiles. Nevertheless, industry associations have initiated efforts to unite Finnish textile companies in forming PROs. All informants agreed that once EPR regulations are implemented, PROs will be the preferred approach, as they are likely to reduce costs and enable knowledge sharing.

4.2 Expected challenges and opportunities of the Extended Producer Responsibility

Eight key themes were identified concerning the expected challenges and opportunities of Extended Producer Responsibility, based on the findings from the collected data. Figure 8 illustrates these themes: the expected opportunities of EPR are presented at the top, along with four corresponding themes, while the expected challenges and their four associated themes are displayed below.

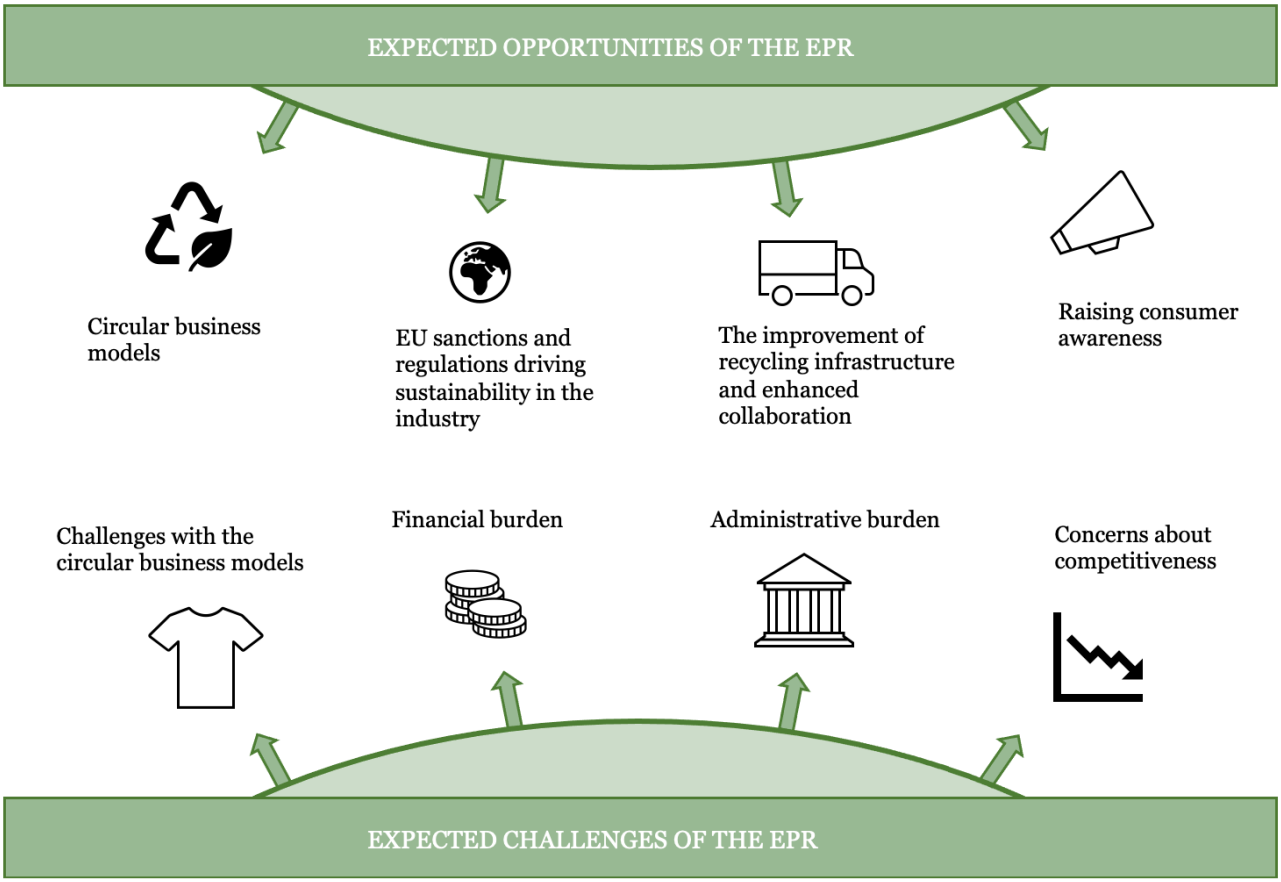

Figure 8: Expected challenges and opportunities of EPR

All themes will be explored in more detail in the following chapters. The expected challenges related to EPR are discussed in Chapter 4.2.1, while the expected opportunities are addressed in Chapter 4.2.2. The themes are individually highlighted in *italics* within the text.

4.2.1 Expected challenges of Extended Producer Responsibility

First, one of the most frequently mentioned challenges identified in the data relates to *the challenges with circular business models*, more specifically, the changes required to transition towards them raise concerns. A key concern among Finnish textile firms is the integration of recycled materials into their operations. Many informants from apparel companies highlighted that the biggest issue with recycled fibers is their difficulty in being blended with virgin materials, as most clothing is made from fiber blends. Additionally, some noted that the durability of existing recycled materials does not yet match that of virgin fibers, making their use particularly challenging for textile firms producing clothing for children or demanding conditions. According to the data, Finnish textile companies are hesitant to use recycled materials if they compromise product durability, as their primary goal is to minimize waste. If recycled materials result in a shorter lifespan, they do not effectively support this objective.

Many informants emphasized the need for further development in textile-to-textile fiber recycling to enhance its usability. The quality of recycled fibers must improve, but more importantly, the cost must decrease. Finnish textile firms are hesitant to raise their product prices, fearing an immediate negative impact on sales. In other words, advancing textile-to-textile fiber recycling would make it more commercially viable. The CEO of Apparel Company D (20.02.2025) described it the following way:

> *"More companies like Spinnova are definitely needed. And maybe the key is that the fibers they produce, for example, should become commercially viable for making products. Because the price level of European products is often higher compared to those coming from, for instance, the Far East. So, the fibers need to be commercialized in a way that makes them competitively priced."*

Furthermore, three informants pointed out that, particularly at the European level, textile-to-textile production is considered highly challenging. For example, China has more advanced facilities capable of producing large volumes of fiber, whether recycled or virgin. Therefore, even after the EPR regulations take effect, textile-to-textile fiber production will likely remain in the Far East due to lower labor costs and more advanced facilities. In other words, Europe currently lacks the infrastructure to produce sufficient quantities efficiently and profitably. The Project Manager from the Waste Management Company (24.02.2025) highlighted the situation in the following way:

> *"Then, the large operators whose machines are fine-tuned to work perfectly with virgin cotton or some other material, I totally get why they wouldn't want to go through the hassle of adjusting the machines for recycled fiber. Especially when the quality is somewhat lower than virgin fiber and, on top of that, it can even be more expensive. So why would they do it if they can't charge the customer anything extra for it?"*

Furthermore, only a few informants mentioned the challenges associated with take-back systems and repair services. One informant from an apparel company highlighted that their customers expect a certain level of quality in the products sold through their reuse service, and this standard is quite high. This poses a challenge, as some otherwise good items, such as a jacket missing a button, cannot be resold through their service. As a result, they must find alternative solutions for such products. According to the data, repair services can also become quite expensive, either for the company or the customer. The main challenge is that if repairing an item approaches the price of purchasing a brand-new one, many customers will simply choose the latter. In other words, high labor costs in Europe result in expensive repair services, creating a dilemma when significantly cheaper alternatives from the Far East are available. In addition, some informants pointed out that several obstacles must be overcome before upcycling can truly generate value, including quality concerns and consumer preferences for new products.

However, according to the data, the significant challenge with circular business models is finding a way to make them as profitable and scalable as traditional linear models. All informants highlighted the need to scale the use of recycled materials to ensure they could become the primary alternative to virgin materials in their responses. Two informants expressed concern that without demand, these materials could end up being incinerated, which would be counterproductive since Finnish textile firms would be the ones financing the system in Finland. As a result, many informants suggested that government intervention is needed to encourage the use of recycled materials, making them a more competitive option in the industry. In addition, three informants pointed out that the Finnish market alone is not large enough to provide the benefits of scaling. The Communications Manager of Apparel Organization F mentioned that recycled textiles should be permitted for export to third countries, as there is significant demand for them. Therefore, exporting a portion of the recycled materials abroad should remain an option. However, the informants emphasized that the waste should be sorted first, and only reusable materials should be sent, as exporting waste would only contribute to the global waste problem.

Second, the data indicates that the also commonly recognized challenge for Finnish textile firms in implementing EPR is the *financial burden* it creates. All informants expressed concern about the additional costs introduced by EPR regulations, particularly through eco-modulation fees. Ultimately, these expenses will be passed on to consumers, making products more expensive. This raises fears among informants that consumers may turn to cheaper, less sustainable alternatives from outside the EU instead. For small textile firms already struggling to stay competitive, this shift could be particularly damaging, potentially steering their business in the wrong direction or even forcing them out of the market.

> *"It's kind of at a stage where there's a lot of talk about how we'd like to use recycled materials. But as long as we, as consumers, aren't willing to pay extra for products made from recycled materials, producers won't use them either." (Project Manager, Waste Management Company, 24.02.2025)*

All informants agreed with this perspective and acknowledged that given the current economic situation and weakened purchasing power, consumers are reluctant to pay extra. Additionally, ultra-fast fashion giants like Shein and Temu attract shoppers with extremely low prices, making it even more difficult for Finnish textile companies to justify raising their prices. Yet, the Chief Advisor of Industry Association A noted that the textile industry is currently highly price-driven and emphasized one possible approach is to start considering the true cost of products. If environmental and social factors, which are not well reflected or integrated into business practices currently, were taken into

account, it could lead to shifts in consumer behavior. However, the CEO of Apparel Company D pointed out that, despite a brand's intention to operate sustainably, high costs can ultimately prevent such goals from being prioritized. However, these aspects must also be clearly communicated to consumers so they understand what the additional costs in products represent. Some informants expressed some positive views about the investments, for instance, the Production Manager from Apparel Company B shared their insights on sustainable production, emphasizing that producers may also value their products more when product development requires extra time and investment. In the end, this process allows them to take pride in launching a product they truly stand behind.

> *"I think that in design, too, the more you limit it, the better it usually is. Because that way, it challenges you more. If everything is always possible, then it ends up being nothing." (Production Manager Apparel Company B, 21.01.2025)*

A few informants also noted that many consumers would likely be willing to pay extra if they were assured that the product was genuinely more sustainable and of higher quality than cheaper alternatives. However, this is not always guaranteed in the current market.

Third, a widely recognized challenge among the informants is the *administrative burden* the upcoming regulations will cause. Especially, based on the collected data, there is still uncertainty about how firms will ultimately perceive joining the PROs. The associated costs, including the expense of building the necessary infrastructure and adapting operations, will require both time and financial investment. Some companies may need to hire new employees to manage the operational changes required by EPR regulations. Smaller firms, in particular, may find the additional financial burden overwhelming. However, the Production Manager from Apparel Company B believes that small firms already experimenting with new processes and investing time in innovation may find these regulations less challenging compared to older, larger firms that have long operated more traditionally.

A few informants mentioned that currently, the EPR proposal might even slow down innovation in alternative methods for extending the lifecycle of textile products. The main concern is the ongoing uncertainty about the division of responsibilities and cost distribution. Who will ultimately bear the financial burden? As a result, textile firms may hesitate to invest in new end-of-life processes, fearing that future regulatory changes could require permits, impose specific implementation methods, or lead to unexpectedly high costs, ultimately resulting in unfavorable outcomes. In addition, some informants worry that this will just bring extra bureaucracy and a lot of extra work to the European textile firms, this can mean stricter reporting and extra fees. Even though most of the informants agree that transparency is good, but the costs are worrying especially for small firms.

> *"When it comes to opportunities, we see that a lot depends on other legislation as well. For example, how the new waste legislation will change. (For instance, if) we were suddenly required to have a waste collection permit, that would be an example of something that could completely block our take back operations. There are these worrying thoughts still around these issues." (Circularity Coordinator, Apparel Company C)*

The Project Manager of the Waste Management Company also pointed out that we cannot currently recycle the volume of textiles that the EPR regulations will introduce. While there is still time before the regulations take effect, building a facility capable of handling such quantities will take time, and planning for it should already be underway. However, according to the CEO of Industry Association B, Finland is too small to sustain a viable market for recycled textiles on its own.

Fourth, the final wider theme identified in the data concerning the challenges relates to *concerns about competitiveness.* All informants highlighted that the biggest disruptors in the textile industry are the Chinese ultra-fast fashion giants, Temu and Shein, which are not only taking a significant share of customers from Finnish textile brands but also posing the greatest threat to the industry by flooding the market with extremely cheap products. According to the data, many Finnish textile firms are deeply concerned about shifting consumer buying behavior. A few informants viewed EPR regulations as a potential counterforce to platforms like Temu and Shein, and the broader trend of overconsumption.

However, several informants also recognize why consumers are attracted to these Chinese brands: the ordering process is effortless, and the low prices reduce financial risk. Nevertheless, Finnish textile companies are concerned that ultra-fast fashion giants are hindering progress toward a more sustainable industry. At the same time, the EU's EPR regulations could further weaken the competitiveness of European firms by imposing stricter requirements and raising costs, while Chinese players continue to flood the European market with vast amounts of ultra-cheap products without facing the same regulatory burdens. Additionally, a few informants pointed out that because Chinese companies sell through online platforms, where the consumer technically acts as the importer, EPR laws cannot be applied to these companies. This effectively makes them "free riders," meaning Finnish companies will likely end up bearing the costs of EPR fees instead. All informants expressed concern about whether fair competition will remain or if ultra-fast fashion brands will ultimately push other firms out of business. Two of the informants described the issue as follows:

> *"This will likely cause more market disruption, mainly because there will always be free riders while the number of those actually paying remains smaller." (CEO, Industry Association B, 12.03.2025)*

> *"Right now, especially with these new Chinese entrants. It's been absolutely insane, the volume and scale at which they're flooding into the market. And it's not just the Finnish market. It's all of Europe. The sheer amount of goods coming in, how they're produced, where they're produced, and what kinds of materials are used. That's probably the biggest concern. And then, where do all these products end up? All the clothing and cheap stuff are being pushed into the market. That's what I find most concerning." (CEO, Apparel Company D, 20.02.2025)*

4.2.2 Expected opportunities of Extended Producer Responsibility

First, the data revealed that the most frequently mentioned opportunities for Finnish textile firms regarding EPR are the *opportunity for circular business models* in the textile industry and the strengthening of the existing second-hand market. As regulations change, the focus will increasingly shift toward extending product lifecycles to minimize waste, which will likely drive new innovations. Especially due to eco-modulation fees, existing firms will probably have a strong incentive to make their products more durable and sustainable. Many informants believe that EPR can create new business opportunities, particularly for emerging textile firms, as they can build their operations from the ground up to align with the regulations from the start. For instance, the Production Manager of Apparel Company B (21.01.2025) described it as follows:

> *"There's definitely huge potential for new, emerging brands. And why not for existing ones too? But it's a bit more challenging for those who have been around for a while because they already have established systems in place. There can be rigidity within the company, making it harder to rebuild a new system from scratch. But when you're starting fresh, you basically have the freedom to design the system exactly the way you want."*

The Production Manager of Apparel Company B, aligning with the Project Manager from the Waste Management Company, emphasized that a significant amount of clothing could be upcycled, yet only a small fraction is currently transformed into new products. In other words, there is a large, underutilized supply of materials for new Finnish textile firms. The Production manager firmly believes that upcycling has the potential to foster the growth of successful new brands in Finland's textile industry.

Additionally, the Project Manager from the Waste Management Company pointed out that the upcoming regulations could create opportunities for existing companies to expand their business by offering additional services, such as repair, alongside their core operations. Similarly, the Chief Advisor of Industry Association A highlighted that Finland is already home to innovative textile companies specializing in recycled fiber production. In other words, the expertise for circular production is well established, and these regulations could further accelerate the growth of these pioneering firms. For instance, the Circularity Coordinator of Apparel Company C noted that the cost

of textile-to-textile fibers has already decreased, making it gradually more feasible to integrate them into clothing production. Over time, this could even become the preferred option in Finland. Nevertheless, at the European level, widespread adoption still appears to be more challenging.

> *"This (EPR) is, of course, a way to build a better and more cost-effective process. And hopefully, it will also support the development of more sustainable business models, whether that means rental or repair services." (Communications Manager, Apparel Organization F, 12.02.2025)*

Second, most informants agreed that *EU sanctions and regulations driving sustainability* in the textile industry is essential as the transition would not progress enough without the EU's enforcement. Ultimately, it is EU policies that steer the industry and enforce action. Based on the collected data, Finnish textile firms recognize that the regulations will drive changes in textile production. But at the very least, the regulations will highlight sustainability issues and encourage new approaches to producing more sustainable clothing, especially among companies that have not yet seriously considered it in their business. For instance, firms are likely to start using textile-to-textile fibers in their products and place greater emphasis on product reuse. Especially if lower fees are applied to products made from recycled materials.

> "Obligation is a good motivator, and money ultimately directs the operations. The linear model, where the goal is simply to sell more and more products, just can't work forever." (Project Manager, Waste Management Company, 24.02.2025)

However, many companies have yet to acknowledge the upcoming EPR regulations because they do not perceive them as a binding obligation, which leads to a lack of urgency and commitment. The Project Manager from the Waste Management Company emphasized their efforts to encourage Finnish companies to start preparing for the upcoming EPR policies. With prior experience in producer responsibility, they have identified effective and ineffective approaches, allowing them to guide businesses toward viable models in advance. Preparing in advance could make the transition much smoother once the regulations take effect. However, most companies have yet to invest the time to take advantage of this guidance.

Third, a widely recognized opportunity among the informants is *the improvement of recycling infrastructure and the development of the producer organizations*. Even some informants viewed the development of waste and textile collection infrastructure as one of the key opportunities brought by EPR regulations. However, concerns were raised about the scalability of the system, as its effectiveness in driving the industry toward greater sustainability remains crucial. Despite this, nearly all informants saw it as a positive development that upcoming regulations will likely foster

collaboration among producers. Based on the collected data, a key takeaway was the need for harmonizing EPR laws and the importance of cooperation within the industry.

This has reinforced positive attitudes toward the PROs. Most of the informants from apparel companies are eager to receive guidance from experts in textile end-of-life management, such as waste management companies and second-hand retailers, as they highly value their expertise on the subject. The production manager from Apparel Company B emphasizes the importance of PROs and collaboration, as they enable less sustainable textile firms to learn from those already implementing sustainable practices. Additionally, pooling resources and expertise can be highly beneficial in developing the best solutions for operating under the new regulations. Based on the collected data, many Finnish textile companies are open to collaboration and forming partnerships to navigate these regulatory changes successfully. Rather than reinventing the wheel, they see value in learning from those with existing experience in the field. Furthermore, some informants believe that PROs will create new business opportunities and jobs, as they represent a new concept in Finland.

Fourth, the data indicates that enhancing *consumer awareness* is seen as a major opportunity that EPR regulations can create. All informants agreed that consumers play a crucial role in determining whether EPR for textiles will be truly effective. Ultimately, it is consumers who purchase the final products, meaning their choices will significantly influence how the system functions. According to the data, raising consumer awareness about the textile industry's sustainability challenges and promoting more responsible consumption are essential. For instance, the Communications Manager from Apparel Organization F (12.02.2025) emphasized the following:

> *"One clear benefit is that this will bring the issue more strongly into public discussion. It will also help raise awareness about things like the importance of textile quality. From a business perspective, I believe this is also an opportunity for companies to educate consumers on why making more sustainable choices is worthwhile."*

However, the Chief Advisor from Industry Association A pointed out that firms cannot simply assume that consumers will change their behavior on their own. The shift needs to be actively supported. For example, consumers should be educated, and companies must transparently communicate their business practices. Additionally, the responsibility for change does not rest solely on consumers. As ultimately, legislation drives companies toward more sustainable business practices, and consumers must then be guided toward making sustainable purchasing decisions by communicating correctly. The Circularity Coordinator from Apparel Company C (19.02.2025) stated the following way:

> *"Ultimately, I believe the consumer plays the most crucial role in this. It's about how we can encourage people to use products for longer, repair them, and take proper care of*

> *them. And also, to buy second-hand, take care of their wardrobe, and make sure their clothes last. It's about valuing longevity and appreciating the lifespan of our clothing."*

Although all informants acknowledged some potential benefits and expressed a willingness to view the upcoming regulations in a positive light, many also highlighted missed opportunities within the current EPR framework. There was noticeable scepticism among the companies regarding the real value of the proposed measures. Several informants questioned whether the EPR regulations had been fully thought through, noting a lack of clarity around the concrete positive outcomes they are expected to deliver. For example, the Chief Advisor from Industry Association A emphasized the absence of data demonstrating the environmental benefits of EPR in the textile sector. Some informants also noted that they have observed the French EPR model in practice, pointing out that it has not produced clear or direct positive impacts, and instead has resulted in significant financial burdens for companies. This led to concerns that EPR might merely shift financial responsibility from municipalities to producers, without delivering meaningful results. Despite this, many informants expressed interest in seeing how the regulation will unfold and whether it will ultimately produce tangible, positive outcomes. The next chapter will continue by linking the findings to relevant literature.

5 Discussion on key findings

This chapter places the key findings in dialogue with existing literature, exploring how the informants' responses align with, contradict, or extend previous research. The discussion is structured in line with the Extended Case Method by linking the macro-level context outlined in the literature review (Chapter 2) to the micro-level insights derived from the findings (Chapter 4).

5.1.1 Discussion on sustainability issues and circular models

The findings indicate that Finnish textile companies demonstrate a strong awareness of sustainability issues. This aligns with existing literature, which highlights Finland as an innovative and well-positioned country in the development of circular textile solutions (Kamppuri et al., 2021). Several informants noted that although their companies have not yet integrated recycled materials into their products, they place significant value on product durability and strive to design items that last as long as possible. Given that textile products are often not designed with durability in mind (Ellen MacArthur, 2024a), Finnish textile firms appear to differ from the average firms described in the broader literature.

The findings show that all informants identified circular practices that Finnish textile firms could implement or have already adopted. These practices align with the five circular business models proposed by Lacy et al. (2020, 19–20). In particular, informants highlighted activities related to circular inputs, product life extension, and sharing platforms. Several representatives from apparel companies noted that textile-to-textile fibre technologies are part of their long-term strategies, and there is considerable interest in adopting these materials once they become sufficiently durable and cost-competitive. The circular inputs model focuses on the use of sustainable materials in order to minimise resource waste, and the product use extension model aims to maximise the lifespan of products (Lacy et al. 2020, 19–20). The findings suggest that many Finnish firms are already engaging with these models, especially by prioritizing durability and extending the use phase of their products.

Many informants also identified significant potential for innovation within the Resource Recovery model. This model plays a key role in reclaiming valuable materials from used products and reintegrating them into the production cycle (Lacy et al. 2020, 19–20). Examples of this can already be seen in the work of companies such as Spinnova and Rester, both of which were highlighted in the findings as well as in the literature (Spinnova, n.d.; Rester, n.d.). These companies illustrate how resource recovery can be operationalised in practice and suggest promising directions for the future of circular textile innovations in Finland.

Regarding the reuse of discarded clothing, several informants emphasized that reuse is the most sustainable option. Some Finnish companies are actively supporting this approach by implementing initiatives such as take-back systems. These findings are supported by existing literature, as both Levänen et al. (2021) and Juanga-Labayen et al. (2022) argue that strategies focused on reduction and reuse provide the most effective pathways toward sustainability. Additionally, some informants expressed the view that EPR regulations could help steer the industry in this direction. If EPR frameworks were designed with a clear emphasis on waste reduction as a first priority, they could more effectively support a sustainable circular economy (WWF, 2020).

5.1.2 Discussion on the expected challenges of the Extended Producer Responsibility

The literature reinforces the concerns expressed by informants about the limitations of recycled textile-to-textile fibres. Several informants observed that the quality of these fibres remains lower than that of virgin materials. This is supported by Baloyi et al. (2024), who note that most textile waste is composed of mixed fibres and colours, leading to low-quality recycled outputs that are not suitable for producing high-quality yarn. Furthermore, the literature emphasises the need for continued investment in fibre-to-fibre recycling technologies, with recommendations that part of the EPR funding be directed toward their development (The Or Foundation, 2023). Furthermore, some informants expressed concern about Finland's capacity to manage the volume of waste that will be collected. This issue is also reflected in the literature, which suggests that recycling infrastructure is unlikely to expand quickly enough to meet collection targets, and that EU facilities alone cannot accommodate the global flow of used textiles (The Or Foundation, 2023).

One concern raised by several informants was whether the primary goal of EPR, namely increasing recycling rates, would lead to meaningful environmental benefits, given the current lack of market demand for recycled textiles. Even if EPR regulations align with circular economy principles, there remains a risk of the rebound effect, where expected environmental gains fail to materialise due to external or behavioural factors (Levänen et al., 2021). Informants expressed concern that textile firms may struggle to adapt quickly enough to new requirements and that consumer habits pose a major barrier. This misalignment between policy objectives and market or consumer readiness may lead to unintended, unsustainable actions instead of the intended sustainable ones, ultimately undermining the achievement of sustainability goals. Levänen et al. (2021) also note that the rebound effect is intensified by a limited understanding of the behavioral changes required for the widespread and successful adoption of circular practices.

One of the most frequently mentioned findings was the challenge of scaling recycled textiles and establishing a viable market for collected discarded materials. Some parts of the literature support these concerns and suggest that EPR regulations should be designed with these challenges in mind (The Or Foundation, 2023). However, this perspective has not been widely acknowledged. Informants identified scalability as a major obstacle within the EPR regulatory frameworks. At the same time, the literature acknowledges that without EPR in place, scaling would be nearly impossible, as EPR requires producers to take financial and operational responsibility for the end-of-life management of the products they place on the market (Ellen MacArthur, 2024a).

Some informants expressed concern that without sufficient demand for recycled materials, collected textiles may ultimately be incinerated. This outcome was viewed as counterproductive, particularly given that producers are the ones investing significant resources into the system. Similar concerns are reflected in the literature, which highlights the difficulty in justifying the costs of collection and sorting if a large portion of the collected textiles ends up being incinerated or sent to landfills (Ellen MacArthur, 2024a). One potential solution for this concern found from the findings is that exporting textiles to third countries should remain an option. The literature supports this view, suggesting that international trade may be essential for managing the volume of collected textiles. However, it highlights the need for clear rules to make sure that waste is not sent abroad pretending to be reusable. If discarded textiles are transported, sorted, reused, recycled, or disposed of abroad, policies should acknowledge this reality and take responsibility for the social and environmental impacts on the communities receiving these materials (The Or Foundation, 2023).

Moreover, the data indicates that Finnish textile companies perceive a high level of risk in transitioning to new business models on their own. Companies that transition away from the linear economy may face a competitive disadvantage, as others continue to benefit from the lower costs tied to unsustainable practices, such as cheap raw materials. Especially the informants expressed worries that platforms such as Temu and Shein could become major barriers to fair EPR implementation and place Finnish companies in an unequal and disadvantaged position. Furthermore, the literature also supported the importance of addressing the issue of free riders, emphasizing that all products placed on the market should be included in EPR regulations, whether they come from domestic companies, importers, or online retailers (Eunomia, 2022). To support this, efficient market surveillance at the EU level is considered essential (STJM, n.d.) and the government intervention through strategic policy measures is crucial to drive systemic change in the textile industry (Brewer, 2019, 8).

5.1.3 Discussion on the expected opportunities of the Extended Producer Responsibility

In the findings on expected opportunities of EPR stated that there must be a shift away from the linear economy, as it is not a sustainable long-term model. The literature also supports this view, suggesting that eco-modulation fees could play a key role in encouraging the transition toward circularity by promoting more sustainable practices in the sector (Ellen MacArthur, 2024a; OECD, 2001, 2024; Laubinger et al., 2021). However, most informants expressed concern about these fees and did not view them as positively as the literature suggests. Some acknowledged, though, that such fees might push Finnish textile firms to incorporate more recycled materials into their products. According to Laubinger et al. (2021), eco-modulation criteria such as recyclability, recycling rates, and the presence of hazardous substances can support eco-design improvements that ultimately reduce end-of-life costs.

Furthermore, the upcoming regulations are also likely to encourage new innovations and sustainable product design (OECD, 2001) as EPR is an effective policy tool for minimizing waste (WWF, 2020). The informants support the literature as they emphasized that through EPR regulation the Finnish firms' focus is expected to shift toward extending product lifecycles to reduce waste and add recycled materials into their products. Furthermore, Shamsuzzaman et al. (2025) emphasize that the integration of circular economy principles into fashion waste management has the potential to transform the textile sector fundamentally, prioritizing resource efficiency and the minimization of waste. However, EPR should be accompanied by additional regulatory measures to maximize its impact (Ellen MacArthur Foundation, 2024b; STJM, n.d.)

Most informants agreed with the literature that EPR should be harmonised across the EU, as this could help ensure fair competition within the single market and potentially lead to cost reductions (Muoti ja Urheilukauppa Ry, 2023; STJM, n.d.; OECD, 2024). Furthermore, the informants identified the joint development of waste and textile collection infrastructure as one of the key opportunities introduced by EPR regulations. This view aligns with previous literature, which suggests that EPR can stimulate capital investment in the infrastructure necessary for large-scale reuse and recycling, particularly when policies are harmonized across regions (Ellen MacArthur Foundation, 2023; 2024a). However, in the litarture it was noted that EPR schemes should provide support wherever the materials end up as recycling infrastructure would probably not grow fast enough to match collection targets, and EU facilities alone cannot handle the global flow of used textiles (The Or Foundation, 2023.)

The findings indicate that nearly all informants believed EPR would foster greater collaboration within the Finnish textile industry, and that participation in a PRO would be beneficial. Some informants further noted that PROs could help reduce costs and facilitate knowledge sharing. Consistent with these findings, previous literature suggests that participation in a PRO may be essential for Finnish textile firms, as PROs act as central coordinating bodies responsible for ensuring compliance with EPR legislation. Moreover, PROs can enhance user convenience and increase consumer participation in recycling efforts. (WWF, 2020; Tuottajayhteisö, n.d.)

Yet, some informants suggested that EPR regulations could serve as a communication tool to raise awareness among textile firms and consumers about the sustainability challenges in the industry. The literature supports this idea, noting that the circular economy can serve as an effective means of communication that drives policy action. When such frameworks are widely adopted, they have the potential to create meaningful change (Cantzler et al., 2020). Additionally, transforming consumption patterns, improving consumer awareness, and influencing consumer behaviours are recognized as vital for mitigating the sector's total environmental footprint (United Nations Environment Programme, 2023).

Although opportunities were identified, the findings suggest that some informants remained somewhat sceptical about these prospects, focusing instead on the challenges associated with EPR. One reason for this scepticism is that several informants questioned the underlying motives behind the EPR regulations. They raised concerns about whether these measures are genuinely intended to promote sustainability and circularity or if they risk becoming tools for greenwashing within the industry. Similar concerns are reflected in the literature, where scholars argue that circular economy practices can sometimes lose sight of their core purpose. The key question is whether these practices lead to meaningful, system-wide improvements or whether they overlook long-term ecological sustainability (Fletcher and Tham, 2019). Following the discussion of the findings, the next chapter will outline the overall conclusions of the study.

6 Conclusions

This section integrates the findings of the empirical study with the academic literature and the conceptual framework. The conclusions are organized into three parts. First, the theoretical contribution connects the study's findings to the revised initial framework and discusses their implications for existing research. This section offers insights that may support textile companies in better understanding the expected impacts of Extended Producer Responsibility. Following this, the managerial implications section translates the findings into practical recommendations for industry application. Finally, the limitations of the study are discussed, along with recommendations for future research directions.

6.1 Main findings and theoretical contribution

In recent years, the sustainability challenges within the textile industry have gained widespread recognition, highlighting the urgent need for change. The previous literature highlights significant sustainability challenges within the textile industry (Niinimäki et al. 2020; Selvakumar Paulraj et al. 2021; United Nations Environment Programme, 2023), and the European Union aims to address these through stronger regulatory measures (European Commission, 2023b). This study developed a conceptual framework for analysing the expected impacts of Extended Producer Responsibility for textiles for Finnish textile firms. The final conceptual framework (Figure 8) illustrates how the macro level serves as the foundation for potential impacts, with its current structure influencing micro-level attitudes. At the same time, drawing on interview findings, it highlights the critical role of the micro level, emphasizing that meaningful change requires individuals to believe in the system and act collectively.

Chapter 2.5 presented the initial framework, which was developed based on existing theories, prior research, and relevant literature. This framework served as the foundation for the study. As shown in Figure 9, the findings align with existing literature, however, the framework was revised to incorporate new insights emerging from the empirical data, as conceptual frameworks can be further developed and constructed through qualitative analysis (Jabareen, 2009). In this study, it is essential to connect the micro-level observations to the macro-level context to gain a comprehensive understanding of the phenomenon. The revised framework better supports this goal, as it integrates both the theoretical background from the literature and the perspectives of the experts regarding the potential impacts of EPR from the interviews. Expert insights are crucial in shaping a comprehensive understanding of the phenomenon, as the data informing the conceptual framework should be drawn

from diverse sources such as books, scholarly articles, and interviews (Jabareen, 2009). The revisions are clearly indicated in the orange box, which highlights the micro-level dimension of the studied phenomenon. While the micro-level findings complemented the literature, they also introduced new perspectives that had not been previously emphasized.

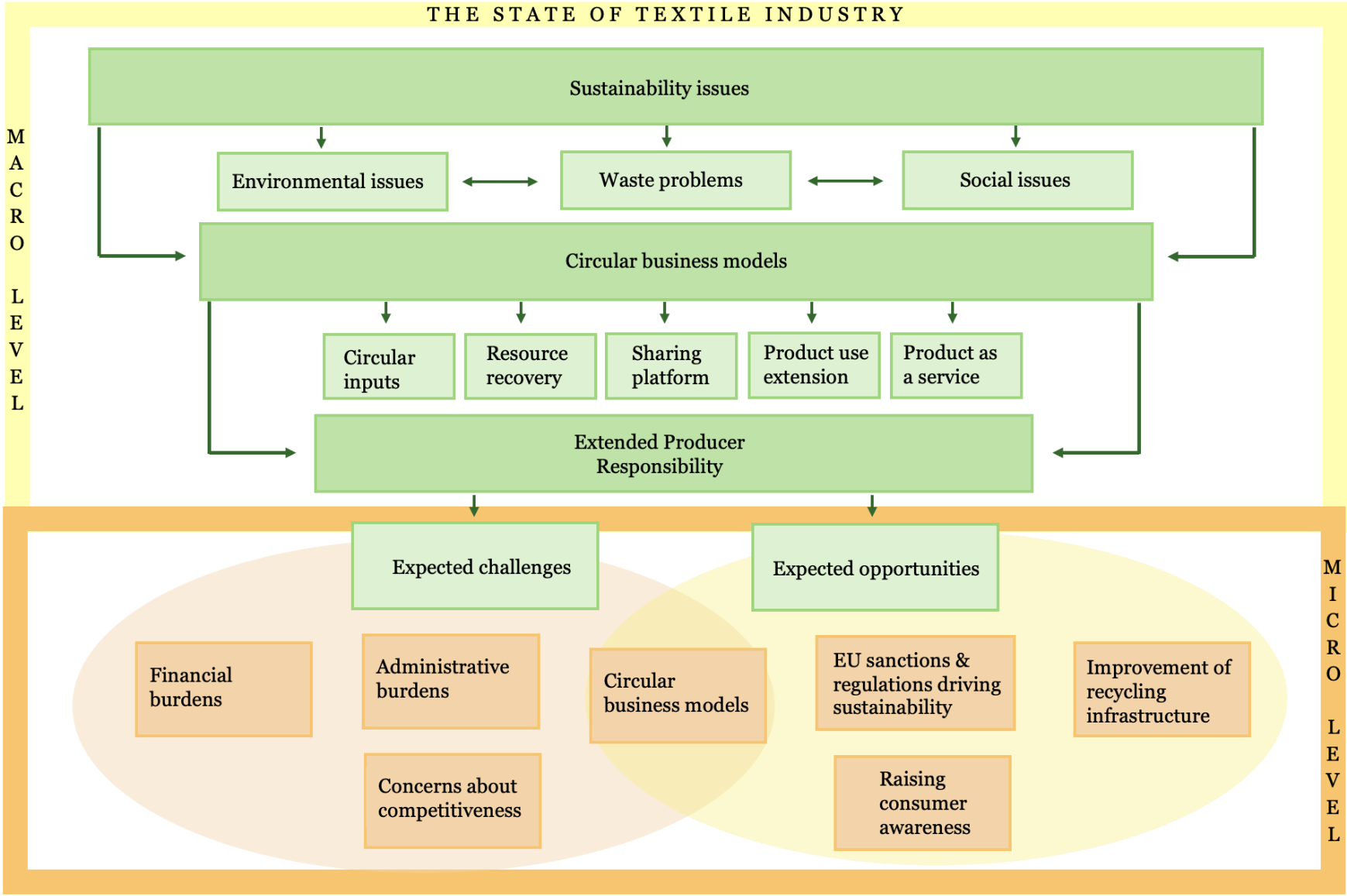

Figure 9: Revised theoretical framework

First, while the proposed strategies for transferring textile industry more sustainable appear promising in theory, the data reveals considerable scepticism among industry stakeholders regarding the effectiveness of upcoming EU regulations. This research revealed that some informants questioned the true motives behind these policies and expressed concerns that their real-world impacts may not have been fully taken into account. Some parts of the literature align with the concerns expressed by firms, questioning whether the circular economy can deliver genuine, system-wide improvements, given that it is built upon the same economic structures that have contributed to the existing environmental and social issues (Fletcher & Tham, 2019). This understanding is essential, since if the goal is to address sustainability challenges, the pathways to achieving it must produce real, measurable impact. It is therefore crucial to critically assess whether sustainability efforts are genuinely impactful or merely instances of greenwashing.

Second, the literature presents some contradictions regarding the effectiveness of the circular business models. Some literature, however, emphasises advantages such as lower costs for raw materials and waste management, as well as increased customer interest through sustainable practices (Korhonen et al., 2016; Tapaninaho & Kujala, 2017). The informants showed more hesitation toward fully adopting circular business models than implementing individual circular practices. Their concerns centered on high initial investment costs, uncertainty regarding short-term profitability, and a general perception that, within the current linear economic climate, a full transition may be unrealistic. These findings highlight the need for governmental support to enable broader systemic change, as firms remain highly skeptical and continue to express significant concerns about the financial implications.

Third, previous literature highlights numerous opportunities related to recycled materials, including methods for preserving material quality and transforming textile waste into new products or fibers. (Juanga-Labayen et al, 2022; Baloyi et al. 2024). However, the findings of this research question the opportunities as a key concern raised relates to the use of recycled materials. Informants questioned whether these materials can genuinely replace virgin resources, as their quality and possibilities for uses are not as good. Additionally, the findings raised again critical questions about what happens after products are collected, sorted, and processed into recycled fibers. Is there a functioning market for these materials? Who will purchase them? These findings are valuable, as Finnish firms seek concrete assurance that their investments in complying with the new regulations will ultimately prove beneficial and justify the time and financial resources spent, which in turn will influence their attitudes toward EPR.

Furthermore, previous literature often references France as a valuable benchmark for assessing the impacts of EPR in the textile sector, as it has been one of the first countries to implement such regulations (Ellen MacArthur, 2024c). This research found that some Finnish textile firms have already been observing the French model in practice, but their impressions have been largely critical. Many noted a lack of visible, concrete environmental outcomes, which has led to scepticism about the effectiveness of the policy. However, existing literature indicates that textile recycling rates in France have improved over time (Innovation in Textiles, 2021). Still, a significant challenge remains as the country lacks sufficient domestic capacity to process discarded textiles at scale (Ellen MacArthur, 2024a). Furthermore, without a viable market for recycled or upcycled materials, their production may have limited impact (The Or Foundation, 2023). These findings reinforce the notion that the market for recycled textiles is not yet fully developed. There is both a shortage of infrastructure for processing post-consumer textiles and a limited demand for recycled or reused materials, which restricts the full realization of circular economy goals in the sector.

Fourth, according to the literature, the point of EPR is to create a more sustainable textile industry by 2030. (The European Commission n.d.) The research supports the view that informants also strongly desire change, with some explicitly stating that meaningful impact is not achievable within the current linear economic model. While they acknowledge the need for transformation, they emphasize that significant changes are especially required on the consumer side. Informants expressed concern about prevailing consumer behavior, particularly the continued popularity of ultra-fast fashion brands from China, which they see as a major barrier to sustainable progress. In contrast, the EU adopts a more positive outlook, using forthcoming regulations to push companies toward more sustainable practices, with the expectation that these changes will eventually shape consumer behavior (Eunomia, 2022: European Commission, 2023b; 2025b). The findings ultimately suggest that current levels of consumption are unsustainably high. EPR may offer a partial solution, particularly if the associated fees are reflected in product pricing. It can potentially encourage consumers to reconsider their consumption habits.

Lastly, a functional EPR scheme has the potential to significantly drive the industry toward greater circularity, as emphasized in previous literature (Eunomia, 2022; European Commission, 2023b). This research also reveals that Finnish textile firms are keen to observe how the EPR framework will develop and what outcomes it will produce. However, the study highlights that concerns about the potential impacts on Finnish textile firms are currently at the forefront. Therefore, it is crucial to understand that concrete actions are implemented, and a clear, effective strategy is formulated to address these concerns. For instance, first, an efficient market for reused and recycled textiles should

be established, potentially through legislation or government support. Second, recycling centres should be centralized in regions such as the Nordics to fully capitalize on the benefits of large-scale production, given that Finland represents a small market and currently lacks sufficient infrastructure. Third, it may simply be time to shift the attitudes of both firms and consumers, as overconsumption of resources continues, and an oversupply of textiles persists in the market. However, with efficient and fair EPR regulations, there is an opportunity to drive real change. Despite the scepticism and concerns expressed by many firms, this moment may represent a pivotal turning point for the industry. Meaningful transformation is likely to require more than minor adjustments. It remains uncertain whether incremental improvements will be sufficient or whether a fundamental shift away from the linear consumption model will be necessary to achieve lasting impact.

6.2 Managerial implications

This study offers valuable insights into the current attitudes of key stakeholders in the Finnish textile sector toward Extended Producer Responsibility. These findings are particularly useful for actors within the textile industry, as they provide an opportunity to begin preparing for upcoming regulations. By identifying which aspects are perceived as most challenging and which are seen as potential opportunities, companies can take proactive steps. Managers are encouraged to integrate EPR-related developments into their long-term strategic planning. This may involve conducting scenario analyses to anticipate different regulatory outcomes and embedding flexibility into business models to accommodate evolving compliance requirements. Early movers may even benefit from competitive advantages.

The results of this study can support Finnish textile firms in evaluating their readiness to implement new services or circular strategies, which may open pathways to innovation and growth. Furthermore, by recognizing the main stumbling blocks in advance, companies can begin to gradually adjust their operations. This progressing approach could ease the transition and reduce the perceived burden when regulatory changes come into force. Moreover, early adopters of circular practices may gain competitive advantages, such as a stronger brand image, improved stakeholder trust, and access to emerging markets.

This study may also serve as a useful benchmarking tool for managers seeking to assess their organization's awareness of EPR. It allows companies to position themselves in relation to others in the industry by identifying potential gaps in awareness, capabilities, and collaborative readiness. Importantly, the findings suggest that awareness of EPR is not yet consistent across the sector. In

particular, some smaller firms have not actively considered the implications of the upcoming regulations. Therefore, this study can also act as an initial point of reference, raising awareness within the textile and fashion sectors and helping firms begin to understand and engage with the forthcoming regulatory requirements.

Furthermore, the findings of this study indicate that Finnish textile firms are eager to collaborate in managing the upcoming EPR regulations. As such, the study may provide additional momentum for initiating the formation of PROs. Responding to regulatory demands may be more effective through collective action via PROs than through individual company efforts. As highlighted in the literature review, PROs play a key role in enhancing user convenience and encouraging consumer participation in recycling efforts. In addition, PROs can serve as central coordinating bodies responsible for ensuring the effective implementation of the EPR system in accordance with legal requirements (WWF, 2020; Ellen MacArthur Foundation, 2024a; Tuottajayhteisö, n.d.).

Lastly, this study can support Industry Associations in further shaping their understanding of the current attitudes among their member companies. This insight can help ensure that the voices of member firms are more effectively represented before the final EPR regulations are implemented in Finland. The findings may also inform which key issues Industry Associations choose to emphasize when submitting official statements to the Finnish Parliament. As such, the study can serve as a valuable reference point when formulating final positions.

6.3 Limitations and suggestions for future research

The primary aim of this study has been to produce reliable findings and novel perspectives on the expected impacts for the Finnish textile industry of Extended Producer Responsibility for textiles. However, due to resource constraints, the study is limited to selected informants from the textile industry within a predefined geographical area (Finland). These limitations restrict the generalizability of the findings and limit their direct application to other industries or broader contexts. Therefore, increasing the number of informants would likely enhance the generalizability of the findings. However, the aim of this study is not to formulate a universal theory, but to enrich academic discourse, introduce new insights into the subject, and lay the groundwork for future research.

However, certain limitations must be acknowledged. The research focused solely on Finnish textile firms, whose responses may not be representative of firms in other countries. Given Finland's high awareness of textile sustainability issues, the findings might differ in regions where sustainability

practices are less developed. For this reason, expanding the geographical focus could have provided deeper insights into the expected effects of EPR on the textile industry. Therefore, future research could explore the expected impacts of EPR on textile and fashion firms in a different geographical context beyond Finland.

Additionally, as this study focused on consumer textiles, primarily within the clothing sector, it did not address other significant areas of the textile industry, such as industrial textiles and business-to-business (B2B) textiles. Notably, a considerable proportion of recycled textiles are currently utilized for industrial purposes. Expanding the scope of research to include these sectors could yield different insights and broaden the understanding of the overall impacts of textile recycling and EPR. Therefore, investigating industrial and B2B textiles represents a valuable recommendation for future research.

Furthermore, it is important to note that, as the final form of the EPR regulations has not yet been established, the perspectives of industry stakeholders remain somewhat uncertain. This uncertainty stems from a lack of clarity regarding how the policy will be structured, which may also contribute to heightened concern or speculation. Furthermore, there is currently not much specific literature or empirical data on the actual impacts of EPR in the textile sector, meaning that the findings of this study cannot be directly compared to existing evidence. For this reason, future research will be essential once the regulations are in place to assess whether EPR genuinely promotes a more sustainable textile industry or merely shifts existing challenges. A critical evaluation of EPR is therefore necessary, particularly given the limited availability of concrete data, as the topic remains both new and evolving.

Beyond the scope of this study, EPR offers numerous opportunities for future research, given its relative novelty and ongoing development. The findings of this thesis suggest a need for further investigation into the actual environmental and social impacts EPR may generate. Especially, future research could explore how EPR influences the social dimension of sustainability, as existing literature has primarily concentrated on its environmental benefits. Moreover, it is essential to assess whether the proposed changes for the textile industry are both effective and practically feasible for textile firms. Future studies should also explore additional strategies for reducing textile waste, as well as enhancing reuse and recycling practices within the sector.

7 Summary

Over the past three decades, consumer attitudes toward clothing changed significantly. Garments that were once valued as durable and long-lasting became increasingly seen as short-lived and disposable. This shift was largely driven by the rise of fast and ultra-fast fashion, which allowed the industry to grow rapidly but also caused considerable environmental and social harm. Overproduction, excessive consumption, and the widespread disposal of textiles contributed to rising levels of waste and pollution, highlighting the urgent need for more sustainable practices in the industry. In response to these challenges, the European Commission introduced new legislative measures to improve the sustainability of the textile sector. A central part of this effort was the introduction of EPR, a regulatory framework that made producers responsible for the entire lifecycle of textile products, including design, manufacturing, disposal, and recycling. EPR aimes to shift end-of-life responsibility from municipalities and consumers to producers, promoting more sustainable product design, circular business models, and improved waste management.

This thesis examined the expected impacts of EPR on Finnish textile firms, with the main objective of understanding how this regulatory change might affect the sector. The study further addressed two sub-questions: the opportunities and challenges associated with the EPR for Finnish textile firms. Together, these questions helped provide a broader understanding of the implications of upcoming EU legislation. The study began by outlining the background and context through a review of the textile industry's development and its environmental impact, with a particular focus on the shift toward disposable clothing.

The literature review introduced the concept of sustainability, especially its environmental and social aspects, such as high-water usage, pollution, greenhouse gas emissions, and labor issues. The circular economy model was presented as an alternative approach that supported closed-loop systems, reduced waste, and improved resource efficiency. The review also defined EPR in detail and discussed its potential to support eco-design, circular practices, and regulatory compliance, particularly when backed by harmonized EU policies and strong oversight. The empirical part of the study applied a qualitative approach, using semi-structured interviews to gather insights from eight experts working in or connected to the Finnish textile and clothing sector. The interview data were analyzed using both predefined themes from the literature and new themes that emerged from the responses. The findings were consistent with previous research and showed that Finnish textile firms largely recognized the limitations of the current linear model. They also saw EPR as a potential driver of circular practices. While companies were already exploring strategies such as durability-focused

design and take-back schemes, they faced practical challenges in scaling up recycling technologies and creating markets for recycled materials.

Beyond these practical barriers, stakeholders raised concerns about the implementation of EPR. These included doubts about the speed of compliance, the risk of unfair competition, and whether EPR would lead to real environmental improvements. Many interviewees pointed to the risk of the rebound effect, where collected textiles might still be incinerated due to limited demand for recycled materials. There were also concerns about the lack of enforcement for international e-commerce platforms, which could result in unfair advantages for non-EU actors. Some informants questioned whether EPR policies were genuinely aimed at sustainability or whether they might be used more as a marketing tool.

Despite these concerns, the study found that EPR held significant potential to improve the textile sector, especially when combined with clear policy implementation, infrastructure investment, and changes in consumer behavior. Achieving meaningful and lasting change, however, required more than regulation alone. It also called for shifts in consumption patterns and greater public awareness. From a managerial perspective, the study encouraged Finnish textile firms to integrate EPR planning into their business strategies. Early adoption of circular business models, participation in Producer Responsibility Organizations, and leveraging Finland's strengths in sustainability and innovation were identified as possible competitive advantages. The findings also provided valuable insights for industry associations in shaping effective and fair implementation of future legislation.

In conclusion, although EPR cannot solve all the complex challenges in the textile sector by itself, it has the potential to act as a strong driver of change. Its success depends on careful policy design, fair enforcement, and strong support for circular economy practices, infrastructure, and responsible consumer behavior.

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Appendices

Appendix 1 Interview questions

Background:

1. Could you briefly introduce yourself and describe your experience on sustainable textiles?

General Awareness:

2. What are your thoughts on the concept of producing textiles from recycled or upcycled materials?
3. Have you come across the concept of Extended Producer Responsibility (EPR) for textiles?
4. How well-prepared do you think Finnish textile firms are for the upcoming EPR regulation implementation?
    - (What steps, if any, have textile companies already taken to prepare for EPR requirements?)
5. Are there ongoing sustainable practices in place, and how well do they align with EPR requirements?

Opportunities and challenges of EPR:

6. What opportunities do you see for Finnish textile firms arising from the implementation of EPR?
    - What revenue streams could the interviewee forecast or envision to originate from EPR?

7. What challenges do you think Finnish textile firms might face from the implementation of EPR?
    - What financial challenges might companies encounter in complying with EPR requirements?

Success & failure of EPR:

8. Based on your perspective, what recommendations would you give to policymakers to ensure EPR is effective and fair for Finnish textile companies?

9. What role do you think consumer behavior plays in the success or failure of EPR?

Appendix 2 Operationalization table

The research question	**The sub research questions**	**Themes**	**Interview questions**
How is Extended Producer Responsibility for textiles expected to impact Finnish textile firms?	What opportunities could be associated with the EPR for textile firms?	Circular business models, EU sanctions and regulations, Recycling infrastructure, Consumer awareness	2,3,5,6,8,9
	What challenges could be associated with the EPR for textile firms?	Circular business models, Financial burden, Administrative burden, Competitiveness	2,3,5,7,9

Appendix 3 Cover letter

Dear Mr./Mrs.

I hope all is well.

I am Elli Abrahamsson, a master's student from Turku School of Economics, and contacting you regarding a master's thesis that I am conducting for my master's degree to investigate how the implementation of Extended Producer Responsibility (EPR) for textiles is expected to impact Finnish textile firms. This research has received funding through a Tex-Inno scholarship, granted by the Finnish Textile & Fashion Union due to its significant relevance and practical utility for the textile sector.

The aim of this study is explored by answering three sub-questions.

1) How are the opportunities of the EPR seen?
2) How are the challenges of the EPR seen?
3) What elements should be included in the EPR for textiles to make it beneficial for textile companies?

With this said, I kindly ask if you or anyone from your company working within strategy/sustainability matters would be available for a (45min -1 hour) interview around the topic of Extended Producer Responsibility? If yes, you may already suggest suitable times for the interview. The interview can be held in English or Finnish.

With permission, interviews will be recorded and stored temporarily, but data in the final thesis is anonymized (see attached). You will be also given a chance to get acquainted with the interview questions beforehand (see attached).

I look forward to your answer. Kindly let me know your thoughts on the matter by X

With kind regards,
Elli Abrahamson

Appendix 4 Informed consent form

INFORMED CONSENT FORM

01.01.2025

This study forms the basis of a Master's thesis by Elli Abrahamsson, a student at the Turku School of Economics, University of Turku. As part of this research, Elli Abrahamsson is conducting interviews to explore how the introduction of Extended Producer Responsibility (EPR) for textiles is expected to affect Finnish textile companies.

The interview study will take place between January and February 2025 and will include approximately 8–10 participants. Each interview will last about 45 minutes to 1 hour and will be recorded with the participant's consent. Participation in the study is entirely voluntary, and participants may withdraw or cancel their participation at any point during the research process without providing a reason. Withdrawing from the study will not cause any harm, and any data collected prior to withdrawal will be destroyed within one week.

Individual participants will not be mentioned in a way that allows identification in the research reports. The researcher will treat all data confidentially and will use pseudonyms to ensure that neither individuals nor companies can be identified. The code key linking names to pseudonyms will be held exclusively by the researcher. The interview data will be stored in a pseudonymised format (using pseudonyms). The researcher is committed to ensuring that confidential or personal information will not be disclosed to third parties. The pseudonymised and transcribed interview data will be destroyed after the Master's thesis has been evaluated.

The results derived from the data will be used to form the conclusions of the research. In addition, a Master's thesis based on the findings will be published. If the data is used for broader academic publications beyond the thesis, separate consent will be sought from the interviewees.

One potential risk of participation is that participants may feel vulnerable sharing personal information with the researcher. However, it is emphasized that participant safety, identity, privacy, health, and well-being will be respected and protected throughout all phases of the study. The researcher is committed to adhering to good scientific practices (as outlined in the guidelines for ethical review in human sciences by the Finnish National Board on Research Integrity, TENK: tenk.fi) and high standards of research ethics.

Elli Abrahamsson