USE OF ECOLABELS BY FINNISH CIRCULAR ECONOMY FORERUNNER COMPANIES– A CURRENT PERSPECTIVE

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ABSTRACT

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Abstract
New solutions are required as the current linear economic model is causing environmental, social and economic problems, and the current production and consumption patterns are unsustainable. Transitioning towards sustainability and adopting a new circular economic model can provide solutions for the present issues. Companies have much responsibility in the transition process and can contribute to making consumption and production sustainable. However, companies require tools to make the required changes. In literature, ecolabels have been suggested as tools that can help companies achieve their circular economy and sustainability-related goals and help transform the current consumption and production practices.

The current thesis is a quantitative survey study aimed at figuring out how Finnish forerunner companies in circular economy perceive the use of ecolabels and whether or not the companies use ecolabels to achieve their circular economy-related goal. The theoretical framework of the study focused on sustainability, the circular economy, and ecolabels. In addition, the construction of the theoretical framework was also supported by reviewing sustainability transition, the presentation of sustainability and circular economy-based business models, and the mapping of the relationship between ecolabels and the circular economy. The data collection was conducted via a survey sent to 214 Finnish companies. Thirty-nine companies responded to the survey.

The thesis results reveal that most of the surveyed companies do not currently have ecolabels in use, and only one company reported using ecolabels for achieving their circular economy-related goals. In total, ecolabels were used by nine of the respondents. The most significant drivers for ecolabel use were found to be gaining a competitive advantage, encouraging consumers to buy the company's products, increasing the value of the products, and increasing the company's value. The most significant barriers to using ecolabels were the high costs of ecolabels and the length of the obtaining process. In addition, it was found that companies that are using ecolabels are facing a lack of benefits and an influx of challenges with the use of ecolabels. Therefore, more research is still needed into the usability of ecolabels and how all kinds of companies, especially SMEs, could benefit from ecolabels when transitioning towards a circular economy.

Key words
circular economy, ecolabels, Finland, sustainability

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TIIVISTELMÄ

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Tiivistelmä
Uusia ratkaisuja kaivataan, kun nykyinen lineaarinen talousmalli aiheuttaa ongelmia ympäristölle yhteiskunnalle ja taloudelle, ja nykyiset tuotanto- ja kulutustavat ovat kestämättömiä. Siirtyminen kohti kestävää kehitystä, ja uuden kiertotalouteen perustuvan talousmallin käyttöönotto, voivat tarjota ratkaisuja näihin haasteisiin. Siirtymisvaiheessa korostuu yritysten merkittävä vastuu, jolla ne voivat myötävaikuttaa kulutuksen ja tuotannon kestävyyteen. Muutoksen aikaansaamiseksi yritykset kuitenkin tarvitsevat oikeanlaisia työkaluja. Ympäristömerkkejä on kirjallisuudessa ehdotettu sopiviksi työkaluiksi yritysten sisäisten kiertotalous- ja kestävyystavoitteiden saavuttamiseksi, sekä muuttamaan nykyisiä kulutus- ja tuotantotapoja.
Tämän kvantitatiivisen pro gradu -tutkielman tarkoituksena oli selvittää, miten suomalaiset kiertotalouden edelläkävijäyritykset kokevat ympäristömerkkien käyttämisen, ja käyttävätkö yritykset ympäristömerkkejä kiertotaloustavoitteiden saavuttamiseen. Tutkimuksen teoreettinen viitekehys keskittyi kestävään kehitykseen, kiertotalouteen ja ympäristömerkintöihin. Lisäksi teoreettisen viitekehyksen rakentumista tuki kestävän siirtymän tarkastelu, kestävien ja kiertotalouteen perustuvien liiketoimintamallien esittely ja ympäristömerkkien ja kiertotalouden välisen suhteen kartoittaminen. Tutkimus suoritettiin kyselynä, joka lähetettiin 214 suomalaisyritykselle. Kyselyyn vastasi 39 yritystä.
Tutkimustulosten mukaan suurimmalla osalla tutkittavista yrityksistä ei ollut käytössään ympäristömerkkejä, ja vain yksi yritys ilmoitti käyttäneensä ympäristömerkkejä kiertotalouteen liittyvien tavoitteiden saavuttamiseksi. Yhteensä ympäristömerkkejä oli käytössä yhdeksällä kyselyyn vastanneista yrityksistä. Merkittävimpiä syitä ympäristömerkkien käyttöön olivat kilpailukyvyn parantaminen, kuluttajien kannustaminen yritysten tuotteiden ostoon sekä yrityksen ja tuotteiden arvonnousut. Merkittävimmät seikat ympäristömerkkien käyttämättä jättämiselle olivat ympäristömerkkien korkeat hankintakustannukset ja hankintaprosessin kesto. Lisäksi tutkimuksessa havaittiin, että ympäristömerkkejä käyttävät yritykset eivät ole havainneet juurikaan hyötyjä ympäristömerkkien käytöstä ja käyttöön on liittynyt haasteita. Tulokset osoittavat, että lisää tutkimuksia on tehtävä ympäristömerkkien käytettävyydestä ja siitä, miten kaikenlaiset yritykset erityisesti pk-yritykset voisivat hyötyä ympäristömerkeistä siirtyessään kohti kiertotaloutta.

Asiasanat
Kiertotalous, ympäristömerkit, Suomi, kestäväkehitys

Säilytyspaikka
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CONTENTS

LIST OF TABLES AND FIGURES

1 INTRODUCTION

1.1 Background and key concepts

There is an increasing consciousness of environmental problems both on local and global levels (Roy, 2000). However, the need for change has been present for some time now. The Earth Summit in Rio de Janeiro in 1992, led by Maurice Strong, identified the limits that humankind would have to take into account to secure sustainability for both the current and future generations (McDonough & Braungart, 1998).

Unsustainable production and consumption patterns are some of the main drivers for climate change and resource scarcity in the world (Suikkanen & Nissinen, 2017). The world is currently using even renewable materials so swiftly that the materials do not renew fast enough naturally (Nakajima, 2000). Moreover, the rapidly expanding population growth does not ease the challenging situation with finite resources (Allwood et al., 2011). It has been predicted that the global middle class will be doubled by 2030, meaning that the global middle class will gain two billion more people by 2030, which further contributes to already unsustainable production and consumption patterns (Esposito et al., 2018; Hetemäki et al., 2017). Both globally widely discussed challenges and local challenges are affecting the environment and causing a need for a transition towards sustainability (Näyhä, 2020).

The traditional linear economic model currently predominant in the world can also be called the cradle-to-grave model, where products are disposed of when no longer used (McDonough & Braungart, 1998). Much technological and socio-economic value has been gained from the linear fossil-based economic model (Hetemäki et al., 2017). In addition, excessive resource use has provided Europe with growth and wealth (European Commission, 2011). However, many believe that the traditional economic model is to be blamed for putting in danger natural ecosystems, human health and economic stability (Ghisellini et al., 2016; Marrucci et al., 2019; Hetemäki et al., 2017). Ellen MacArthur Foundation's (2013) report argues that the current linear take-make-dispose economy causes scarcity, volatility, unpredictable prices and stagnant consumer demand. Furthermore, the linear economic model drains resources and utilises fossil fuels on a level that cannot be supported much longer (Palahí et al., 2020).

According to Allwood et al. (2011), the linear way that engineered materials have been used has been unsustainable since the industrial revolution. During the Industrial Revolution, humans believed that nature was meant to be cultivated, and resources were infinite. It has become evident that business, as usual, is no longer sustainable. (Bocken et al., 2014; McDonough & Braungart, 1998). As reported by Roy (2000), in the 1980s, companies began to transition towards cleaner manufacturing and better efficiency in energy and materials.

As the changes made in the past have fallen short, the pressure for an urgent transition towards sustainability falls mainly on the shoulders of governments

and companies (Roy, 2000). Resource scarcity, pollution, and economic crises are a few reasons for making changes in business strategies inevitable (De Los Rios & Charnley, 2017). Much creativity and innovation are required from companies to keep their business profitable, all while taking real action on sustainability concerns (Roy, 2000). Decreasing material consumption plays a significant role in easing the situation but so does changing the way materials flow from linear models to circular ones (Nakajima, 2000).

Resource exploitation is gaining even more momentum, and solutions are needed to preserve value in materials for longer to secure a sustainable future. Circular economy (CE) promotes the efficient use of materials and closed material loops as a tool for a sustainability transition (De Los Rios & Charnley, 2017). Additionally, circular flows aim to get as much use and value of a material as possible before it is disposed of (Nakajima, 2000). The CE can be viewed as a new sustainable paradigm that can replace the traditional linear economic model (Marrucci et al., 2019; Prieto-Sandoval et al., 2019). The CE paradigm is increasingly appealing for policymakers, businesses, researchers, and NGOs as the world's current sustainability issues weaken the economy and jeopardise environmental sustainability (Antikainen & Valkokari, 2016; Giutini and Gaudette, 2003; Prieto-Sandoval et al., 2019).

CE is not only about efficient use of materials, but other sustainability aspects are also regarded. Using renewable energy and eliminating toxic chemicals are also valued in CE. Moreover, it is believed that companies committed to CE can achieve a competitive advantage by investing in high-calibre planning of products, materials, systems and business models (Ellen MacArthur Foundation, 2013). Some of the recoded benefits of CE for companies are material savings, decreased supply risk, increased customer loyalty and new revenue streams (Ellen MacArthur Foundation, 2014; Schenkel et al., 2015; Winkler, 2011).

Despite the similarities and shared interest between sustainability and CE, the two concepts are inheritably different. Geissdoerfer et al. (2017) stated that the two concepts have different goals, timeframes, origins, and prioritizations, to name a few. Sustainability is a much older concept, and sustainability goals are much broader and harder to define. Meanwhile, CE has clear goals of minimising waste and using resources efficiently (Geissdoerfer et al., 2017). Sustainability can be applied to any given situation, while CE is for economic actors.

Transitioning towards a new closed-loop economic model that addresses sustainability issues adequately is a complex process. In order to complete the transition, sufficient funding, innovation, new policies, and business models are required (Antikainen & Valkokari, 2016; Palahí et al., 2020). Efforts from companies, governments, and consumers alike are needed (Bocken et al., 2019; Prieto-Sandoval et al., 2019). Since especially companies are expected to make sizeable changes to benefit nature and human health (Bocken et al., 2020). Companies are facing both internal and external pressures to make these changes. Transitioning towards sustainability within companies can mean implementing new business strategies and business models, such as circular economy business models (CEBM) (Bocken et al., 2020). Public and private purchasers are also insignificant roles in the process of changing market pressures. However, it can be a struggle

to make more sustainable choices without accurate information on products environmental performance (Suikkanen & Nissinen, 2017).

A variety of circular business model innovation tools and eco-design tools exist for companies to use. The tools aim to assist companies in achieving environmental goals and objectives. However, according to Bocken et al. (2019), not all the tools are equally effective in helping companies. Tools can vary in terms of the required level of required sustainability, complexity, time, and commitment in the transition process (Bocken et al., 2019). Policy and information instruments, such as ecolabels, about products environmental impacts and greenhouse gas emissions are necessary to steer the current consumption patterns towards more sustainable and circular ones and help companies improve their unsustainable business models (Suikkanen et al., 2019).

Ecolabels are labels in products that can assist consumers' decision-making by communicating the product's environmental information. Ecolabels often communicate to the consumer that the company that produces the product has differentiated itself environmentally from other companies and products (Prieto-Sandoval et al., 2019). The idea behind ecolabels is that products or services within the same group have different environmental performance levels. The product or services within the group that have the best environmental performance can apply for an ecolabel. In order to get an ecolabel, the company must make sure that their product or service performs up to the ecolabel's criteria (Nakajima, 2000; Prieto-Sandoval et al., 2019; Thidell, 2009).

There are in total over 450 ecolabels in the world. Different industries and sectors and countries and regions have their own ecolabels (Golden et al., 2010). The ecolabels can be divided into different typologies. The International Organization of Standardization (ISO) has identified three types of labels that are perhaps the most well-known ecolabel types. All three types are both voluntary and environmentally focused (Holopainen et al., 2019). In addition to the ISO ecolabel types, there are also multiple different typologies of ecolabels, such as binary and multi-tier ecolabels.

1.2 Research questions

This thesis aims to determine whether or not Finnish CE forerunner companies use ecolabels and how the companies perceive using ecolabels to achieve CE-related goals.

The research questions (RQ) are as follows:

RQ1. Are ecolabels used by the circular economy forerunner companies? If so, what kind of ecolabels are used?

RQ1.1. Do the companies expect ecolabels from their value chain actors? If so, what kind of ecolabels are expected?

RQ2. What factors are for and against the use of ecolabels?

RQ3. How do the companies perceive the relationship between ecolabels and circular economy-related goals?

The research was completed via an online survey sent for 214 Finnish companies considered forerunners in CE. In addition to the current study, the survey answers will also be used as a part of a PhD study prepared at the Jyväskylä University School of Business and Economics. After getting familiar with the research topic and theory related to it, the author believes that the current research has not been completed previously. However, as companies have a significant role in sustainability and CE transition, this research is an essential contribution to the existing knowledge.

1.3 Structure of the thesis

In chapter 2, the current thesis aims to present a comprehensive picture of the theoretical and conceptual framework related to the subject matter. Existing literature is reviewed in detail about how companies could utilize ecolabels to achieve their sustainability and CE related goals and, therefore, contribute to a broader societal sustainability transition. After that, chapter 3 explains the methods of the study. Chapter 4 presents the results of the study. In chapter 5, prior research is utilized to reflect and compare the results of the thesis. Moreover, chapter 5 discusses how the results of the thesis contribute to research and practice. Lastly, the final chapter 6 concludes the most important findings of the thesis and provides future research suggestions. The appendix includes the survey form—table 1. Below presents the structure of the thesis.

Chapter	*Contents*
1. Introduction	Introduces the background and concepts of the thesis. Describes the research questions.
2. Theoretical and conceptual framework	Reviews literature on the key concepts and theoretical frameworks of sustainability, transition, circular economy, circular economy business models, ecolabels, and other related concepts.
3. Research methodology	Describes the research design, scope of the study, data collection method, and data analysis.
4. Results	Presents the results of the thesis.
5. Discussion	Discusses the results of the thesis and their implications and compares the results with existing research on the issues.
6. Conclusions	Presents final conclusions and limitations on the thesis, and suggestions for future research.

Table 1: Structure of the thesis

2 THEORETICAL FRAMEWORK

The theoretical and conceptual framework for the thesis starts with a description of sustainability, together with sustainability transition. An introduction to the CE concept follows the description of sustainability transitions. The relationship between sustainability and the CE are examined and compared. After introducing the concepts, sustainable business models are discussed. The CEBMs are on the focus as they are an essential part of the thesis. Next, the thesis introduces tools that can assist companies in changing their business models and operations towards circularity and sustainability. Amongst the available tools, the current thesis focuses on ecolabels, and therefore, ecolabels are discussed from different perspectives in detail.

2.1 Sustainability

The modern idea of sustainability comes from forestry, where the volume of regrowth should be greater than the volume of harvested wood (Sieferle, 2007). The idea of sustainability has afterwards been a part of the ecology in the sense of living in a state where nature can regenerate naturally over time before further use. Nowadays, sustainability can be understood as a state that is being maintained over time (Geissdoerfer et al., 2017). Although sustainability has been initially related to the environment and nature nowadays, sustainability is a much broader concept. For example, the triple bottom line of sustainability refers to balancing environmental, social, and economic sustainability factors. Moreover, the triple bottom line is understood as an interlinked system that only functions as a whole (Geissdoerfer et al., 2017).

The triple bottom line of sustainability is urgently required to provide solutions for the pressing issues the world is facing. In terms of the environment, pollution, biodiversity loss, and excessive use of resources are some of the most pressing concerns. Meanwhile, poor working conditions, decreasing levels of employment, and poverty are some of the social worries currently present. Finally, economic instability is caused by supply risk, deregulated markets, and flawed incentives (Geissdoerfer et al., 2017). The holistic change required needs to cover social, economic, and environmental aspects of sustainability (Bocken et al., 2014). In order to further sustainability, the United Nations (2015) has identified 17 sustainable development goals and 169 related targets that should be achieved by 2030. The United Nations'(2015) sustainable development goals aim to heal the planet, the people and the prosperity with collaborative efforts.

The concept of sustainability provides an image of a world where the environment, society and economy are taken care of so that the current and future generations can have their needs met (World Commission on Environment, 1992). Bocken et al. (2014) suggest that sustainable economy building blocks include

decreased consumption, choosing environmental and societal welfare over economic growth, turning away from linear economic models that waste resources, functionality over ownership, increased human creativity, and finally, choosing collaboration over competition. However, the changes are fundamental and challenging to make (Bocken et al., 2014). Sustainability can be challenging to measure as sustainability has no endpoint, but it is an ongoing process (Wells, 2016).

2.2 Sustainability transition

In order to transition towards sustainability, commitment is required from multiple levels of the socio-technical system (Baumgartner & Rauter, 2017; Markard et al., 2012). Within the system, multiple networks, such as actors, institutions, and knowledge, are closely tied together and interact to provide services for society. The socio-technical system significantly affects what happens within the society and how the system transforms (Markard et al., 2012). According to Shove and Walker (2007), a transition is a process of moving from a circumstance to another. A transition process always consists of fundamental changes on multiple dimensions and involves various actors over a long time. Furthermore, either as complementary or substituting for existing ones, a transition process involves the emergence of new organizations, business models and products (Markard et al., 2012).

Moreover, Shove and Walker (2007) explain that transition management stems from systems thinking. Systems thinking aims to evaluate socio-technical systems throughout their emergency, transformation and decay. Shove and Walker (2007) pose that according to transition management, it is possible to make deliberate interventions to socio-technical regimes and attain goals such as achieving sustainability.

A sustainability transition is a long-term process that involves multiple dimensions and causes fundamental changes to socio-technical systems (Markard et al., 2012). In order to achieve holistic sustainability, changes are required throughout the socioeconomic system, and the changes need to be cultural and structural (Stubbs & Cocklin, 2008; Geissdoerfer et al., 2017). Guidance and governance are insignificant roles in sustainability transition, as the process includes long-term goals that require collaboration from multiple actors.

Therefore, to complete the transition towards sustainability, sufficiently funding, innovation, new policies, and business models are required (Antikainen & Valkokari, 2016; European Commission, 2011; Palahí et al., 2020). Some successful policies that have supported the sustainability transition are the taking back legislation and the precautionary principle (Nakajima, 2000). Moreover, the European Commission (2011) highlights the following actions to be crucial, paying attention to prices and taxes to balance resource costs, advocating for innovative thinking, especially when it comes to businesses, focusing on researching and training, and lastly, cooperating internationally.

Both internal and external factors support companies' transition processes. Näyhä (2020) found that human resources and intangible resources were required to carry out a successful sustainability transition process in forest-based companies. Furthermore, the organizational culture must support innovation and flexibility, which might require structure and guidance from different tools and methods (Bocken et al., 2019). The organizational culture must be encouraged by top management, and the top management needs to be committed to sustainability and change management processes (Giutini and Gaudette, 2003; Seidel et al., 2007). Companies also need to focus on strategic thinking, and fulfilling customer needs to gain competitiveness and longevity (Näyhä, 2020). The external environment is in an important role when a company is conducting their strategy planning. Communication with customers and other external stakeholders allow companies to provide products and services that align with external needs and wants. Furthermore, companies must understand the future challenges and how the market is changing to remain competitive (Näyhä, 2020).

Changes in different levels of the operation process can cause a domino effect that fluctuates everything that follows the changed part of the operation. For example, sourcing can affect production processes, administrative actions, and even employee training (Winkler, 2011). Therefore, before making changes, plans and management strategies must be implemented to ease the upcoming changes. Furthermore, Papagiannakis et al. (2014) found that environmental innovation, integration of stakeholders and high-order learning in companies can facilitate further environmental goals. A self-feeding loop of achieving higher-level goals can eventually lead to the entire business immigrating sustainability within its strategy (Papagiannakis et al., 2014).

On the other hand, transitioning towards sustainability can cause inequality within society. The inequalities can especially manifest when comparing developing and developed countries (Hansen et al., 2018). Each country and region might have different challenges with achieving sustainable development goals and targets, and therefore collaboration is needed (UN, 2015). Companies can also face barriers in transitioning towards sustainability, such as the complicated nature of the sustainability issues, insufficient support from the external environment, or insufficient research done on alternative business models (Murray et al., 2017). Companies with sizeable investments in their current production mechanisms, which can be based on mass production, can struggle to make effective changes. Unfortunately, the cost of materials does not often reflect the environmental impacts associated with the production (Allwood et al., 2011). A burden in the transition towards sustainable business is that companies might publish responsibility and sustainability reports to appear as responsible businesses while continuing operations as usual and making no actual improvements on their sustainability. In reality, a holistic approach is required from companies to achieve sustainability (Murray et al., 2017).

2.3 Circular economy

CE is a paradigm that is believed to have the potential to replace the traditional linear economic model and solve the global concerns for environmental sustainability (Antikainen & Valkokari, 2016; Bocken et al., 2019; Korhonen et al., 2018a; Marucci et al., 2019; Prieto-Sandoval et al., 2019). CE can even be viewed as an umbrella concept for other related concepts such as sharing economy (Blomsma & Brennan, 2017). However, the definitions of CE in literature still have an abundance of variety. Kirchherr et al. (2017b) researched the conceptualization of CE, and the authors found multiple ways to define CE within the literature. People were also found to understand the concept differently. The authors note that that is part of the reason why scholars can have trouble conceptualizing CE. Within the following paragraphs, the current study aims to paint a comprehensive picture of the fundamentality of CE by taking into account the variety of the definitions provided in the literature.

CE is no longer a new concept but a concept that has been widely discussed in the literature (Ghisellini et al., 2016). There is no clear indication of the first introduction of CE (Ellen McArthur Foundation, 2015). However, the CE is rooted as far back as the 1960s, but the CE paradigm has started to gain more popularity over the past decade (Bocken et al., 2019). De Los Rios and Charnley (2017) dated the formation of CE views back to 1862 to "Waste Products" by Simmonds. Furthermore, De Los Rios and Charnley (2017) also include the following publications to be meaningful in the formation of CE, Boulding's (1966) "The Economics of the Coming Spaceship Earth", Ayres and Kneese's (1969) "Industrial Ecology", McDonough and Braungart's (2002) "Cradle to cradle", Stahel's (1997) "Performance economy", and Lovins et al.'s (1999) "Biomimicry". CE is deeply embedded in industrial ecology and environmental economics (Ghisellini et al., 2016; Murray et al., 2017).

Perhaps even for longer than in Europe in China, CE has been an essential pathway to sustainability. Already in 2009, China introduced the "Circular Economy Promotion Law of the People's Republic of China" and made itself the CE frontrunner in the world. China relies on CE to aim towards economic development and environmental change (Murray et al., 2017). CE in China differs from the CE that the Europeans might be familiar with. CE in China is understood as a concept that aims for achieving harmony between society, economy and nature (Naustdalslid, 2014). Furthermore, the endorsement of CE in China differs according to Ghisellini et al. (2016) from the endorsement of CE in Europe. In China, CE is endorsed with a top-down method. Meanwhile, in Europe, the method seems to be more bottom-up.

In its essence, CE aims to both efficiently use materials and products and preserve value and utility in materials and products throughout their entire life cycles (Azevedo et al., 2017; Marucci et al., 2019; Nakajima, 2000). Using materials to their highest yield and minimizing negative externalities helps sustain natural capital (Ellen MacArthur Foundation, 2015). Linguistically CE is the opposite of

a linear economy. While, descriptively, as seen in figure 2. CE describes the circular nature of the concept where resources are circulating in the system and not disposed of after use (Murray et al., 2017). Therefore, CE aims to provide closed resource loops as an alternative for the current linear economy that focuses on overproduction, consumption, and disposal (Bocken et al., 2019; Prieto-Sandoval et al., 2018). The closed loops lead to a more regenerative system of minimizing waste and emissions (Geissdoerfer et al., 2017).

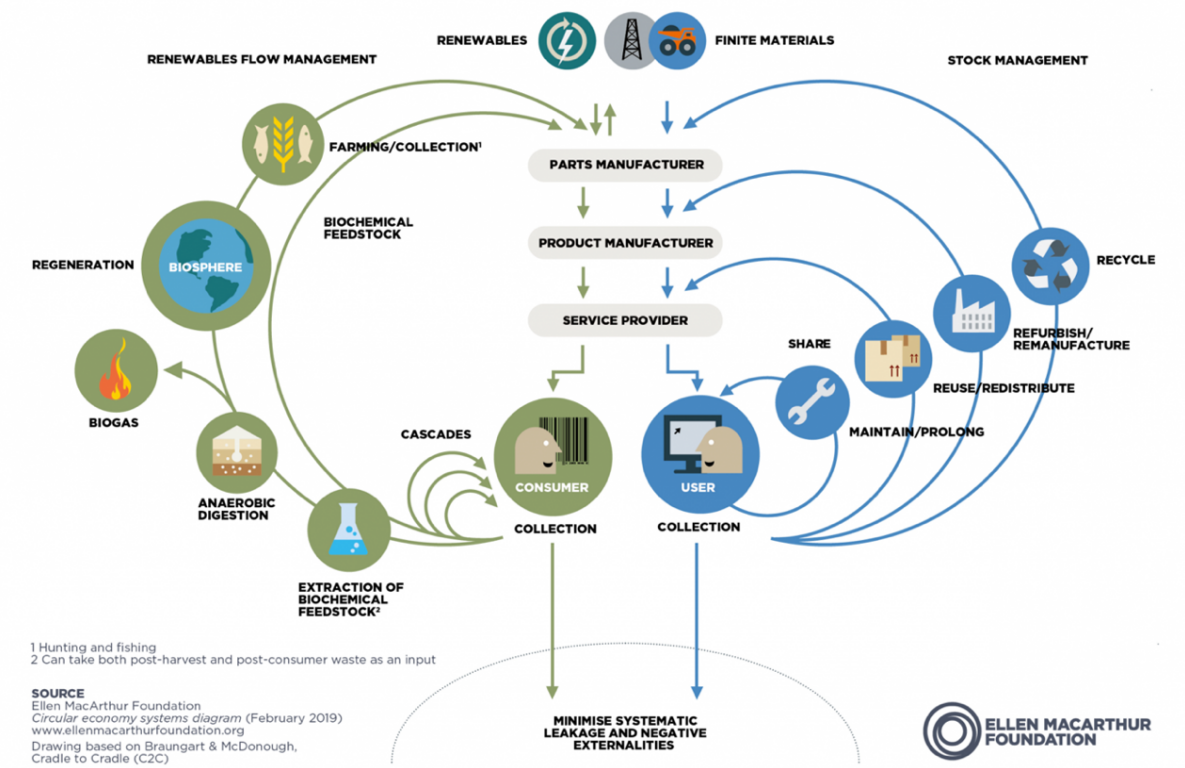

Figure 1: Circular economy systems diagram (Ellen MacArthur Foundation, 2019, p. 37).

Ellen MacArthur Foundation (2013) has identified powers that enable the CE. Power of the inner circle involves minimizing the use of similar materials, which means that the faster products return to use via, for example, recycling, the fewer new materials have to be obtained to fill the need for the products. The power of circling longer aims to magnify the time or number of cycles that materials have. The power of cascaded use aims to gain as much diversity out of a material's reuses as possible. The power of pure circles refers to circling materials to preserve their quality to sustain the longevity of the materials (Ellen MacArthur Foundation, 2013).

While Murray et al. (2017) explain that, ultimately, CE is focused on cycling resources. An essential part of achieving CE's goals and aims is the 4R approach, reducing, reusing, recycling, and recovering activities. Especially recycling is a cornerstone element of CE (Murray et al., 2017). Ellen MacArthur Foundation (2015) describes CE as a system with regenerative and restorative intentions and designs. Moreover, instead of thinking that products and services reach an end of life, more value can be gained by restoring and reusing processes.

Kirchherr et al. (2017b) found that only some authors use the 4R approach, and there are differences between the combinations of the 4Rs used between authors. The most common Rs often present in CE definitions are reduce, reuse and recycle, which has also been called the 3R framework.

Innovations on different levels are essential to CE (Stahel, 2016; Ghisellini et al., 2016). Konietzko et al. (2020) state that circularity is not a property of a product or service but a property of a system. Therefore, transitioning towards a CE paradigm is not done only by encouraging product eco-innovation but also ecosystem and business model innovation. Product innovation yields new products, but companies' business models often require drastic changes in their value creation mechanisms to achieve sustainability. On the other hand, ecosystem innovation is vital because it is needed to change the entire environment where companies, consumers, and other actors all co-exist (Konietzko et al., 2020). Overall, CE can be seen as an innovative entity that can be modified into many different forms as long as the idea of efficiency and closed-loop systems are involved in the model (Suikkanen & Nissinen, 2017).

CE as a concept requires attention on all levels, from government policies to businesses and consumers (Esposito et al., 2018), and therefore, system-thinking is an integral part of CE (Ellen MacArthur Foundation, 2015). The Ellen MacArthur Foundation (2015) highlights education, financing, collaborative platforms and a new economic framework as essential components in CE. CE can be perceived on macro, meso and micro levels (Prieto-Sandoval et al., 2018; Yuan et al., 2006). CE aims for sustainability in a broader sense on the macro-level by tackling eco-cities, institutionalism, and environmental policies. Meanwhile, the meso-level targets a more comprehensive regional transition via industrial networks and environmental protection. On the other hand, at the micro-level, businesses transition towards circularity within their operations and create eco-innovations. (Prieto-Sandoval et al., 2018; Yuan et al., 2006). While a successful transition towards sustainability requires involvement on all possible levels, the current study focuses mainly on the micro-level of CE as the focus is on companies.

Urbinati et al. (2017) suggested four different types of ways for a company to adopt circularity within their operations. Downstream circularity means that a company has a marketing campaign or price scheme that encourages customers to reuse. However, more extensive internal changes are lacking. Upstream circularity means making circular efforts in production but lacking to communicate the changes for customers. Full circularity means that the company is committing circularity upstream and downstream. The fourth model is the linear model, where no circularity related activities are conducted.

In order for companies to achieve full circularity, there are multiple things to take into consideration. Within a company's operations, efforts towards CE can include, for example, avoiding the use of toxic chemicals, using renewable energy, and designing products with circular thinking to allow the products to be easily recycled or recovered after the initial use (Ellen MacArthur Foundation, 2013; European Commission, 2019; Nakajima; 2000). Part of the CE is also to en-

courage consumers to use products to maximize the use time of a product (Cordella et al., 2020). Optionally, some companies view the consumers as users due to the shift from buying to leasing (Ellen MacArthur Foundation, 2013).

2.3.1 Drivers for circular economy

CE is undoubtedly intriguing for companies, NGOs, researchers, and governments alike. Perhaps the most important driver for CE is that it is a possible tool for sustainability transition (Giutini and Gaudette, 2003; Korhonen et al., 2018a). Ellen MacArthur Foundation (2019) suggests that a transition towards CE is required to accomplish climate targets and achieve the UN's sustainable development goals. It has been suggested that the transition towards CE could mean 48% emission reductions by 2030 and up to 85% by 2050 compared to the corresponding levels in 2012 (Pitkänen et al., 2020; Kirchherr et al., 2018). Furthermore, it has been estimated that CE can contribute to a 53 % reduction in material consumption by 2050 if implemented holistically (Esposito et al., 2018).

CE includes multiple aspects that can positively contribute to achieving environmental objectives on a broader societal level and the company level, such as minimizing the use of resources, production of waste, and emissions (Konietzko et al., 2020). Moreover, CE tends to aim for carbon neutrality and incorporates many other sustainability trends, such as industrial ecology and resource efficiency (Ranta et al., 2020). CE can positively raise awareness about the importance of value and quality of material cycles (Korhonen et al., 2018b).

In addition to the environmental sustainability benefits, CE can also deliver economic and social benefits. According to Ellen MacArthur Foundation (2015), adopting CE could increase Europe's net benefits by €0.9 trillion by 2030. More specifically, the economic benefits of CE for Europe could be worth 600 billion euros of cost benefits and an increase of up to 7% in GDP (Pitkänen et al., 2020). Meanwhile, by 2030 Finland could receive a massive 2-3 billion euro value potential if Finland commits to support the CE (Sitra, 2016). Some positive social benefits that can be gained from the transition towards CE include job creation, well-being, accessibility of healthy food, an increased sense of community via sharing activities (Pitkänen et al., 2020). Kichherr et al. (2018) suggest that by 2030 the CE could deliver up to two million new jobs. Adopting the CE could also provide 75 000 new jobs to Finland by 2030 (Sitra, 2016). Furthermore, CE promotes job creation and employment on all skill levels (Myllymaa et al., 2021).

Companies can have both internal and external drivers for adopting CE into their operations. Internal drivers for companies towards CE can include support from the demand network, company culture, and team commitment (De Mattos & De Albuquerque, 2018). Further internal drivers can be the possible financial benefits such as added value for their brand and increased profit margins (Allwood et al., 2011; Kirchherr et al., 2017a). Companies might also gain supply chain security, material savings, increased customer loyalty, new revenue streams, and increased demand for businesses (Ellen MacArthur Foundation, 2015; Ellen MacArthur Foundation, 2014; Schenkel et al., 2015; Winkler, 2011).

Companies can be motivated to transfer their business models due to linear systems causing liability to risks such as supply disturbance and increased raw material costs (Ellen MacArthur Foundation, 2013).

External drivers for achieving CE within organizations can include, for example, legislative support and support from a local government (De Mattos & De Albuquerque, 2018). Moreover, it is suggested in the literature that some environmentally conscious consumers are willing to pay more for products that perform well environmentally (Brécard et al., 2009; Carmona, 2011).

2.3.2 Barriers for circular economy

Although the possible gains from implementing CE sound promising, an array of barriers can also be identified, Kirchherr et al. (2017a) found four categories for CE barriers applied on micro-, meso, and macrolevels: cultural, technological, market, and regulatory-related barriers. The cultural barriers relate to the lack of awareness or desire to contribute or search knowledge about CE within society, companies and value chains. Technological barriers mean that the company or the society lacks in technological implementation of CE, for example, due to lack of data. Regulatory barriers mean the lack of support that is offered for CE via policies and legislation. Lastly, market barriers are related to CEBM's lack of economic viability, for example, due to the required investments being too high, not having enough funding, or low prices of virgin materials (Kirchherr et al., 2017a).

Some cultural barriers include that more research is still needed on the positive effects of CE (Ghisellini et al., 2016). Furthermore, forming indicators for CE still requires much attention (Elia et al., 2017; Myllymaa et al., 2021). Gaining a better understanding of the sub-national effects of CE is especially important as it is needed for local decision making (Myllymaa et al., 2021). In addition, the CE's effect on CO2 emissions has not been studied enough (Ympäristöministeriö, 2016). However, the social dimension of CE is even less studied and not as well understood as the economic and environmental dimensions. Therefore, one of the main barriers to CE is, in fact, the lack of understanding of the social dimension of CE (Pitkänen et al., 2020). The things that are currently understood about the social aspects of CE include a general lack of social benefits (Murray et al., 2017) and a variable dispense of advantages and disadvantages of CE between people and regions (Myllymaa et al., 2021). Furthermore, The CE conceptual framework should include more important social aspects such as social equity based on diversity, financial equity, religion, gender, race and more (Murray et al., 2017).

CE's technological barriers include that more attention is required to investigate, especially the required energy to recycle materials. Allwood et al. (2012) suggest that perhaps more energy is required in the recycling process than would be to acquire raw material by mining, for example. Furthermore, according to Murray et al. (2017) and Korhonen et al. (2018a), CE can be castigated for its simplified goals and unintended residuals. Murray et al. (2017) clarify their concerns by explaining how some actions are understood as sustainable and cause distress

for the environment. Furthermore, Murray et al. (2017) point out that durable product design might not always be the best and most efficient option ecologically. Products that are designed for a shorter life are, in some cases, better for nature (Murray et al., 2017). As nothing lasts forever, products designed for a longer life can be more difficult and expensive to break down and recycle (Murray et al., 2017). Lastly, in their study, Kämäräinen (2020) found that even if companies could find CE-related information, understanding the information was challenging due to being too technical. Companies were found to struggle with implementing the technical information into their operations. A lot of time and resources are required from companies to research and figure out how to implement CE into their operations (Kämäräinen, 2020).

In order to achieve a more comprehensive transition towards CE, consumer involvement, support from leadership and institutions, and involvement of business traditions are required (Pitkänen et al., 2020). However, companies can find it difficult and time-consuming to find information about CE, and there is not enough external support to help companies with CE implementation (Kämäräinen, 2020). However, it has been found that CE can be challenging to manage and govern witch causes regulatory barriers (Korhonen et al., 2018a).

Market barriers of CE include, for example, that some authors believe that CE contributes towards a steady-state economy (Ghisellini et al., 2016). Furthermore, in any case, a systematic transition involves risks such as causing instability to the economy (Ellen MacArthur Foundation, 2015). Moreover, for companies to adopt circularity in their operations, sizeable changes are required, and practical challenges must be faced (Myllymaa et al., 2021; Urbinati et al., 2017). The sizeable changes can mean reconstructing an existing business model or forming an entirely new business model. The changes with business models are not easy and can require new management practices, new skills, and new technology (Urbinati et al., 2017).

2.4 The relationship between sustainability and circular economy

Sustainability and CE are both motivated by environmental concerns, and both concepts agree that substantial changes are needed to overcome the concerns. Both concepts also share the idea of communication and collaboration being required to make the drastic changes possible (Geissdoerfer et al., 2017). Sustainability and CE both operate in multi and interdisciplinary levels and acknowledge the need for non-economic aspects in development. Both concepts also value innovation and stakeholder cooperation. Both are global concepts that hold production and consumption and the current state of technology as concerning issues. Both concepts also require fundamental changes in the system to improve, for example, the balance of the triple bottom line (Geissdoerfer et al., 2017).

Despite the similarities and shared interest between sustainability and CE, the two concepts are inheritably different. According to Geissdoerfer et al. (2017), the two concepts have different goals, timeframes, origins, and prioritizations, to

name a few. Sustainability is a much older concept, and sustainability goals are much broader and harder to define. Meanwhile, the CE has clear goals of minimizing waste and using resources efficiently (Geissdoerfer et al., 2017). Sustainability and CE concepts are designed for different contexts and purposes. Sustainability can be applied to any given situation, while the CE is mainly for economic actors. Sustainability defines no clear goals or responsibilities, but the CE is quite specific to the required responsibilities in the transition (Geissdoerfer et al., 2017).

Geissdoerfer et al. (2017) found that the CE is not viewed as a similar concept to sustainability, but rather it is a tool that can be used to improve environmental sustainability. Similarly, Bocken et al. (2014) state that circularity is an option amongst other concepts towards improved sustainability. Meanwhile, according to Ghisellini et al. (2016), the circular economy is a sustainability pattern. CE quite literally aims to achieve the 12th sustainable development goal, "Responsible consumption and production" (Myllymaa et al., 2021).

2.5 Sustainable business models

Business models are used to explain how a company operates. The company's competitive strategy and value creation methods are some of the aspects that are important in business models. Traditionally value in business models is understood as the value that the business apprehends and the customers and stakeholders the business has (Bocken et al., 2019). Furthermore, business models usually include the following main elements, value proposition, value creation, and value capture (Bocken et al., 2014; Bocken et al., 2019; Wells, 2016; Boons et al., 2013).

According to the neoclassical economic theory, companies should maximize shareholders' profits (Stubbs & Cocklin, 2008). In this model, environmental and social goals are not as necessary, and the model cannot adequately take environmental and social issues into account. Furthermore, the model only takes environmental and social issues into account if it benefits the company. In contrast, a sustainable company has environmental, social, and economic concepts equally balanced in its vision, mission, and strategy (Stubbs & Cocklin, 2008).
According to Bocken et al. (2014), the current industrial sustainability is mainly defined by corporate social responsibility, eco-innovations, and eco-efficiency. However, the themes mentioned above are not holistic enough to contribute to long term sustainability. Therefore, sustainable business models are needed. Sustainable business models can operate as a bridge between sustainable businesses and the system level (Boons et al., 2013).

Bocken at all. (2019) pose that the sustainable business model innovation process can be based either on reforming the old business model or starting blank with a completely new business model. Business model innovation is a process with many phases and details on different business levels (Bocken et al., 2019). Business models help companies in commercializing their innovations. Therefore,

if a company aims to transform towards innovation, a new business model might be needed (Antikainen & Valkokari, 2016). Some actions that are found to be needed for a company to adopt a sustainable business model successfully include technological innovation, collaboration, knowledge management, a well-planned transition process, and sustainability reporting (Baumgartner & Rauter, 2017).

A sustainable business model is a business model that is at the same time profitable as well as reduces environmental or socio-economic burden via products or services (Wells, 2016). Business models differ from each other by value-based mechanisms. Sustainable business models have the opportunity to utilize value mechanisms broader compared to the traditional business model due to the missed opportunities of traditional business models where negative externalities are not accounted for in the pricing of a product (Bocken et al., 2019). Bocken et al. (2014) explain that the environment and society are considered critical stakeholders whose interests should be acknowledged in sustainable business models' operations. Sustainable value creation requires that the company communicates with its external environment and external actors to create alliances and arrangements (Bocken et al., 2014).

Supply chain sustainability plays a vital role in companies overall sustainability (Wells, 2016; Winkler, 2011). Sustainability must be viewed as a holistic concept that reaches beyond a company's boundaries. Therefore, supply chain relationships can also advance a company's environmental sustainability (De Boer, 2003; Winkler, 2011). According to Winkler (2011), significant enough societal change cannot be achieved if companies only focus on their environmental impacts. Likewise, only minor improvements can be achieved by transitioning towards sustainability locally. A systemic approach to sustainability requires global collaboration (Winkler, 2011). Sustainable and ethical sourcing practices might be more expensive than unsustainable options, but it is an integral part of sustainable business models. Sustainable and ethical sourcing can be motivated by regulations or secure a company image (Wells, 2016).

Bocken et al. (2014) have come up with a variety of sustainable business model archetypes. The archetypes are divided into three categories of technological, social, and organizational. The archetypes under the technological category are "maximize material and energy efficiency", "create value from waste", and "substitute with renewables and natural processes". The archetypes under the social category are "deliver functionality rather than ownership", "adopt a stewardship role", and "encourage sufficiency". Lastly, the archetypes under the organizational category are "repurpose for society / the environment" and "develop scale-up solutions". Bocken et al. (2014) explain that the sustainable business model archetypes can be combined or used by themselves based on the organization's need.

2.5.1 Circular economy business models

CE comes with new circular economy focused business models acting as drivers for the new economic paradigm (Bocken et al., 2019; Ranta et al., 2021). According

to Bocken et al. (2019), the growing popularity of CEBMs could be indicating the broader transition towards the CE paradigm. CEBMs can provide opportunities for new frameworks that can improve the currently widely used business models (Ghisellini et al., 2016). CEBMs define how a company deals with creating, delivering and capturing value while operating with or within a closed-loop system (Antikainen & Valkokari, 2016).

CEBMs are constructed of various research avenues such as closed-loop value chains, industrial ecology, business model research and product-service systems. (Bocken et al., 2019). Common factors amongst CEBMs is the goal for material circulation, efficient resource use and finding innovative ways to extend a product's lifecycle (Lewandowski, 2016; Ranta et al., 2020). Moreover, efficiencies in manufacturing and design are also in important roles (Bocken et al., 2019). CEBMs aim to change product life cycles towards the cradle to cradle instead of the end of life model. The CEBMs are believed to decrease the environmental burden and save money (Bocken et al., 2019; Lewandowski, 2016). Ranta et al. (2020) found that the customer value proposition in the CE is outward-focused and driven by the market. Improved usage experiences, combined with environmental and socio-economic value, deliver value for the broader scale of stakeholders in society (Ranta et al., 2020).

The popularity of CEBMs has not taken over most businesses yet due to, for example, the drastic changes required to execute the transition (Bocken et al., 2016). Furthermore, it can be challenging to follow one's chosen path instead of the path most businesses follow (Bocken et al., 2019). To ease the transition, it is crucial to introduce circular models early in product design processes (Bocken et al., 2016). Furthermore, other factors that can assist in transitioning towards a CEBM include willingness and commitment from top management (Urbinati et al., 2017). For companies that are in the process of transitioning their business model into CEBMs, the focus must be on holistic, innovative changes in how they create, deliver, and capture value (Bocken et al., 2019). Changing business models into CEBMs might require trialling and testing how different options suit the company and measuring the sustainability gained with each model. Stakeholder involvement with external and internal stakeholders is also vital in making drastic internal changes (Bocken et al., 2019). Furthermore, digital solutions can provide valuable support for companies with CEBMs. Digital solutions can help with inventory management, material processing, and increasing knowledge about material tracking and customer knowledge (Ranta et al., 2021).

2.5.2 Circular economy business model types

In literature, there are various typologies for CEBMs. All CEBMs enable value creation with the CE resource flow strategy in mind (Ranta et al., 2021). For example, Stahel (2016) presents that there are two types of CEBMs. Type one focuses on the longevity of products through activities such as remanufacturing and maintenance. On the other hand, the second type is more recycling focused where old products are recycled into new resources (Stahel, 2016). However, the

current study divides CEBMs into five different groups that have been used by multiple researchers either precisely with the same names and descriptions or with very similar names and descriptions, as seen in table 2. (Guldmann, 2016; Lacy & Rutqvist, 2015; Moreno et al., 2016; Sitra, 2017; Upadhyay et al., 2019). Table 2 below describes the five business model types.

Circular economy business model type	*Explanation of the business model type*	*Value Flows*
Product as a service	Products act as a service used by customers via leasing or pay-for-use agreement with no transfer of ownership. Manufacturers act as service providers instead of selling products. Can improve efficiency and effectiveness.	Slowing resource loops
Renewability/ Resource recovery	Using renewable, recyclable, or biodegradable resource inputs in designing and manufacturing. Recovering can happen within the company itself or by recovering material from other companies.	Cascaded uses
Sharing platform	A platform that encourages users to maximize the usage of a product via, for example, selling it forward. Upsurge the utilization rate of products.	Slowing resource loops
Product-life extension	Extending the life of a product either via using a product as long as possible or allowing the product to be reused with the help of repairing or refurbishing.	Cycling for longer
Resource efficiency and recycling / Circular supplies	Coming up with solutions that are both material and energy-efficient. Aiming for industrial symbiosis.	Narrowing resource flows

Table 2: Circular economy business model types (Adapted from Moreno et al., 2016).

Moreover, a third typology of CEBMs found from literature divides CEBMs into three groups of slowing loops, closing loops, and narrowing loops. The value flows of the CEBMs used for the thesis are similar to the third CEBM typology. In the third typology, slowing loops means that products are, for example, maintained in order to keep them in the cycle for longer. Closing loops means that materials are recycled efficiently. Narrowing loops means that a product is produced with fewer materials. One CEBM can include factors from all three categories (Antikainen & Valkokari, 2016). In addition to the above mentioned CEBM typologies, Ranta et al. (2021) discuss another CEBM typology that is once again similar to the other typologies. This typology divides the business model into "repair and maintenance", "reuse and redistribution", "refurbishment and remanufacturing", "recycling", "cascading and repurposing", and "organic feedstock".

The CEBMs can be linked with four different value bases inner circle, circling longer, cascaded use, and pure circles (Guldmann, 2016). Business models are always contextual, and it is crucial to tailor business models to fit the company's needs individually (Guldmann, 2016; Ranta et al., 2021). In order to achieve a fundamental transition towards CE, the CEBMs need to be used not only by frontrunners but also within the mainstream businesses (Myllymaa et al., 2021).

2.6 Ecolabels

A variety of improvements are needed in order to ease the way towards a more resource-efficient world. Public and private purchasers are in a significant role in the process of changing market pressures. Changes that private purchasers can make with the right tools include minimizing waste, investing in durable and well-manufactured products, and recycling and repairing possibilities (European Commission, 2011). However, they will be unable to make more sustainable choices without accurate information on a product's and organization's environmental performance (Bratt et al., 2017; Suikkanen & Nissinen, 2017). Policy and knowledge instruments about products environmental impacts and greenhouse gas emissions are required to steer the current consumption patterns towards more sustainable ones (Suikkanen et al., 2019).

In this thesis, the relationship between circular economy and ecolabels is the focus. Environmental assessment tools, including ecolabels, and analytical tools, perceive an image of a product or service during the entire lifecycle or a specific part of the life cycle. Product labelling schemes are often based on either the environmental or social performance of products within a specific product or industry category. (Bratt et al., 2011; Gullbrandsen, 2006).

Ecolabels are environmental assessment tools that provide and communicate information on a product's environmental impacts for public and private purchasers (Thidell, 2009). Ecolabels belong to a group of environmental product information schemes (EPIS) that are, in most cases, voluntary for companies to use (Diekel et al., 2021). Ecolabels are based on the theory that there are differences in the levels of environmental sustainability within a product group or service industry (Thidell, 2009). For example, two products from the same product group can be produced in entirely different circumstances, and one of the products can be superior in terms of environmental performance. Ecolabels assist in highlighting the differences and promoting the products that have superior environmental performance (Thidell, 2009). Ecolabels are claims of a product's environmental properties (De Boer, 2003).

Moreover, ecolabeling is a process where a product, material or service is compared against sustainability criteria. If the product performs well enough, it gets awarded a label of approval. Based on the number of environmental claims on the markets, it can be viewed that perhaps consumers favour environmentally friendly products, and therefore, ecolabels can affect consumers' purchasing behaviour (Nakajima, 2000; Prieto-Sandoval et al., 2019; Thidell, 2009).
Ecolabels act as tools that consumers can use when figuring out the environmental performance of products before purchasing the products. If a product has an ecolabel, the consumer can rely on the product performing well in the environmental sector (Suikkanen & Nissinen, 2017). Ecolabels communicate to the consumer that the company that produces the product has differentiated itself environmentally from other companies and contributed to the eco-innovation process (Prieto-Sandoval et al., 2019; Thidell, 2009). From the perspective of sustainable consumption, ecolabels do not judge what products to buy or not to buy. The

labels provide information of which products might be superior within a product group, but labels do not influence consumption levels (Thidell, 2009).

Product labels were initially used to protect consumers and improve product safety (Iraldo et al., 2020). The first-ever environmental label scheme was the Blue Angel label in Germany in 1977 (Bratt et al., 2011). The purpose of the Blue Angel Label was to provide consumers with reliable environmental information of products while markets were flooded with environmental claims (Thidell, 2009). Other countries followed Germany's lead by coming up with their ecolabels. The Nordic Swan Ecolabel (The Swan) was a joint project amongst the Nordic countries. The Swan was the first ecolabel conducted in cooperation with multiple countries (Prieto-Sandoval et al., 2019). Likewise to The Swan, the EU Ecolabel is significant as it aims to provide common standards for an entire region (Prieto-Sandoval et al., 2019). Nowadays, many countries and regions have their ecolabeling programs (Nakajima, 2000; Bratt et al., 2011).

2.6.1 Ecolabel typologies

Much like with CEBMs, there are also different typologies for ecolabels. Due to various typologies, it is challenging to compare ecolabels (Diekel et al., 2021). Ecolabels can be either voluntary or mandatory. Mandatory labels include, for example, danger symbols, conformity of standards, declaration of contents, national rating schemes and research and testing institutions. Mandatory labels are often required to be used by law and focus on a specific issue of the product category (Horne, 2009; Thidell, 2009). Ecolabels can be either granted by outside parties or granted independently.

Perhaps the most common voluntary labels are the International Organization of Standardization's (ISO) three types of ecolabels. All three types are both voluntary and environmentally focused (Holopainen et al., 2019). Type III focuses on providing a customer with quantified environmental data. Type III labels are based on Life Cycle Assessment (LCA) and are the best suited for B2B communications (Bratt et al., 2011). Type II is focused on the self-declaration of environmental prediction. The declarations do not have any certifications from third parties. Type I focuses on the third multiple-criteria orientation. Type I includes a license that can be used on products after the criteria are fulfilled (Holopainen et al., 2019). Type I is also the third party verified (Bratt et al., 2011). According to Horne (2009), when ecolabels are discussed in the literature, some authors tend to mean type I ecolabels, although many other types also exist.

In addition to the ISO ecolabel types, there are also other voluntary typologies of ecolabels. Other voluntary groups of ecolabels include product endorsement labels, purchasing databases, and social and ethical labelling. Another typology of Type I labels that is different to the ISO type I label also exist. The other type I label is for single product categories, for example, the Forest Stewardship Certification (Horne, 2009). Lastly, there is a typology that divides ecolabels into two different categories, binary ecolabels and multi-tier ecolabels. The EU Ecolabel is an example of a binary ecolabel. The stamp is given to a product based

on a single assessment. On the other hand, the multi-tier ecolabels include different levels, and products find their place on those levels based on their performance scores. An example of the multi-tier ecolabel is the Leadership in Energy and Environmental Design (LEED) (Prieto-Sandoval et al., 2019).

There are differences between labels on how many life cycle stages are included in the criteria, what impacts are evaluated and how the awarding is carried out (Nakajima, 2000). Some environmental labels only cover a specific environmental issue, while others cover various issues (Bratt et al., 2011). Some labels have rigorous criteria and some more lenient criteria. The most beneficial effects of the labels can be attained with criteria that are in-between strict and lenient. Too strict of criteria can seem too challenging to obtain, and companies will not be interested. Whereas too lenient criteria provide too many companies with the opportunity to obtain the label (Nakajima, 2000). Ecolabels revenue their criteria regularly to achieve continuous improvement in products and services environmental performance (Thidell, 2009).

Moreover, different sectors and industries have in the past been focused on different certification aspects. Some industries' main concerns are environmental, and some are health and safety-related (Golden et al., 2010). Some examples of the variety between industries include ecolabels in the food industry, including focused environmental labels and health-focused labels. Especially labels for organic products have been important since the 1960s. Moreover, fair labour, deforestation, and biodiversity issues are essential in the food industry ecolabels. Meanwhile, in the electronics industry, ecolabels' main concerns are related to sustainability and energy efficiency. Whereas, in the personal care product section, it is common for countries to have their ecolabels. Personal care product ecolabels mainly focus on natural, organic, and sustainable issues. Lastly, in the textile industry, ecolabels focus on environmental sustainability and human health (Golden et al., 2010).

2.6.2 Drivers and barriers for ecolabel use

On a macro-level, ecolabel drivers are mainly related to possible society-wide environmental benefits that ecolabels might deliver via positive contributions in the current consumption patterns. European Commission encourages ecolabel use as a policy instrument to achieve sustainable production and consumption (Minkov, 2020). Furthermore, according to Thidell (2009), it is in policymakers best interest to introduce and support ecolabelling schemes as ecolabels can guide consumers into buying environmentally friendly products. Testa et al. (2015) found that ecolabels can guide consumers' decision making towards environmentally friendly purchasing behaviour. Furthermore, the study found that if consumers are aware of a third-party verified label, they are likely to trust it. In addition, both Agenda 21 and the European Commission (2020) mention that ecolabels are a sufficient tool to affect consumers purchasing behaviour and help achieve a circular economy (Horne, 2009).

Actions within companies can also positively contribute to the entire society's sustainability transition and act as macro-level drivers for ecolabel use. Companies often have to change their production processes, materials and other things to be electable for obtaining an ecolabel, which on a broader scale causes the consumption and production patterns to become more sustainable (Thidell, 2009). Furthermore, Wagner (2008) found that if a company has previously had positive experiences with ecolabelling, it is more likely that the company will produce all of its products along with the ecolabel guidelines and therefore produce environmentally friendly products and further contribute to societal sustainability transition.

Regarding the barriers on a macro-level, whether or not ecolabeling contributes to fundamental changes in consumption patterns emerges. Different barriers can contribute to the possible lack of changes in consumption patterns. Firstly, the amount of ecolabels has exploded over the years, and in some cases, the criteria's of labels can be unclear. An abundance of labels (Minkov, 2020) and the presence of unclear criteria can confuse consumers. Confusion can further affect the amount of trust that ecolabels hold and increase sceptics (Bratt et al., 2011; Chamorro & Bañegil, 2006). Furthermore, Consumers can find environmental labelling confusing as consumers do not often have enough knowledge of regulations, implications, or permits for the labels (D'Souza, 2004). Consumers can further lose trust in ecolabels due to greenwashing (Testa et al., 2015).

In order to overcome the possible barriers, there is a need for a consistent methodological framework for ecolabels for increased clarity of ecolabel use (Minkov et al., 2019). In the future, policymakers might require all products within certain product categories to have a specific label. When that happens, it is critical to make a clear distinction between truthful and misleading claims. Environmental labelling schemes must face three big questions: defining product classes, how the rating criteria should be defined, and how inclusive should the label be (Scammon & Mayer, 1993). Furthermore, especially private ecolabels need to pay attention to having robust scientific foundations (Iraldo et al., 2020).

On a company level, ecolabels can deliver environmental, social, and economic benefits that act as drivers for ecolabel use. Sammer and Wüstenhagen (2006) found that consumers were more likely to pay more money for a product with the best environmental rating. Therefore, companies might gain increased value, better customer reach, market gains, improved competitiveness (Iraldo and Barberio, 2017; Prieto-Sandoval et al., 2019). The Swan was found to deliver sales and marketing related benefits for license holder companies, as the ecolabel communicated the environmental actions that the companies are doing. Moreover, companies also found that they gained better exposure amongst their customers (Kjeldsen et al., 2014).

Improved environmental performance is also a potential driver for ecolabel use within companies. The EU Ecolabel has been found to assist in delivering product and process-related positive improvements in environmental performance. Furthermore, the presence of an EU Ecolabel has been found to enhance the environmental performance of the license holder company and the company's supply chain's environmental performance (Iraldo et al., 2005). According to

Myllymaa et al. (2021), purchasing products with the Swan is one of the most efficient ways to ensure that the purchased product does not include hazardous chemicals. Moreover, in their study of Spanish companies with ecolabels, Chamorro and Bañegil (2006) found that most of the companies had an environmental culture in addition to having ecolabels. The research concludes that ecolabels seemed to be a relatively trustworthy reflection of a company's genuine commitment to environmental sustainability (Chamorro & Bañegil, 2006).

Furthermore, the Swan can also improve work conditions in license-holder companies. Work conditions can improve, for example, by making changes in the chemicals used (Kjeldsen et al., 2014). In addition, companies might feel pressure from their industry to obtain labels as, especially in the case of social responsibility, the entire industry must have a good reputation (Gullbrandsen, 2006). Additionally, introducing an ecolabel into a company is often a strategic choice to manage external pressures (Kjeldsen et al., 2014). Companies sometimes get a request from customers to get ecolabels and can feel pressure to communicate their values for consumers (Gullbrandsen, 2006; Kjeldsen et al., 2014).

Barriers that companies can experience for ecolabel use tend to be economic or environmental. According to Pedersen and Neergaard (2006), there is not enough proof of the usefulness of ecolabels in attracting customers. Furthermore, even if customers would like to make a purchasing decision based on ecolabels, the abundance of ecolabels within the market can confuse consumers (Golden et al., 2010; Prieto-Sandoval et al., 2019).

The environmental effects of ecolabels are not easy to quantify systematically due to the lack of effective methods. However, some studies have been conducted on the topic, and the findings often reveal that different companies and industries may detect different levels of environmental performance-related benefits (Thidell, 2009). The main problem in quantifying the environmental effects caused by ecolabels is that it is challenging to differentiate the effects caused by ecolabels from effects caused by other policy instruments or efforts. In addition, ecolabels might not work well with a product's environmental performance if the product group of the product either has no significant environmental problems or the product group is too harmful to the environment (Thidell, 2009).

Furthermore, barriers for ecolabel use also relate to the genuine commitment to sustainability by license-holder companies. It has been found that companies with ecolabels can loosely be divide into two groups. The first group of companies genuinely values environmental sustainability and sees environmentalism as a business opportunity, while the other group uses ecolabels only for marketing purposes and does not authentically value environmental sustainability. The problem is that ecolabels can lack in communicating the environmental attitudes of manufacturing companies. Therefore, ecolabels are not proof of true environmental philosophy and values within a company (Chamorro & Banegil, 2005).

2.6.3 Ecolabels and the circular economy

Especially third party verified ecolabels are often brought up as possible support mechanisms for CE transition (Meis-Harris et al., 2021). Companies can struggle to transition towards circularity due to, for example, consumers being reserved about the CE concept. Consumers might consider reused products to be inferior to other products. Ecolabels can communicate circularity related information for customers (Boyer et al., 2021). Boyer et al. (2021) found that when all other product attributes were equal, customers preferred products with a label that communicated circularity. Legislations and initiatives need to be strict regarding the CE-related features in ecolabels to minimize possible greenwashing. Moreover, to decrease the possibility of greenwashing, companies must manage to fulfil all existing criteria (Meis-Harris et al., 2021).

According to Meis-Harris et al. (2021), the possible support for CE transition from ecolabels is mainly based on the ecolabels' ability to inform and empower consumers. Therefore, ecolabels can help consumers to adopt new behaviours. However, the researchers found that it is implausible that ecolabels could cause significant changes in consumer behaviours. Moreover, Diekel et al. (2021) found that ecolabels should consider a product's or service's entire lifecycle. However, not all ecolabels require a life cycle assessment. Furthermore, the study describes that especially downstream life cycle stages are not well accounted for by all textile industry ecolabels. Downstream and end-of-life phases are hard to control (Thidell, 2009), and therefore the relationship of ecolabels with the circular economy is hard to control. There are differences between ecolabels in how well they account for the entire life cycle of products.

The future of ecolabels should perhaps be more aimed towards circular improvements and increased trust. Life cycle assessment (LCA) within ecolabel criteria is already used in type III ecolabels for B2B use (Minkov, 2020). Iraldo et al. (2020) suggest that a combination of circularity and sustainability dimensions within ecolabel criteria may improve the longevity of ecolabels.

2.7 The summary of the theoretical and conceptual framework of the thesis

Figure 2 below presents how the different concepts tie in together for the tentative theoretical framework of the current thesis.

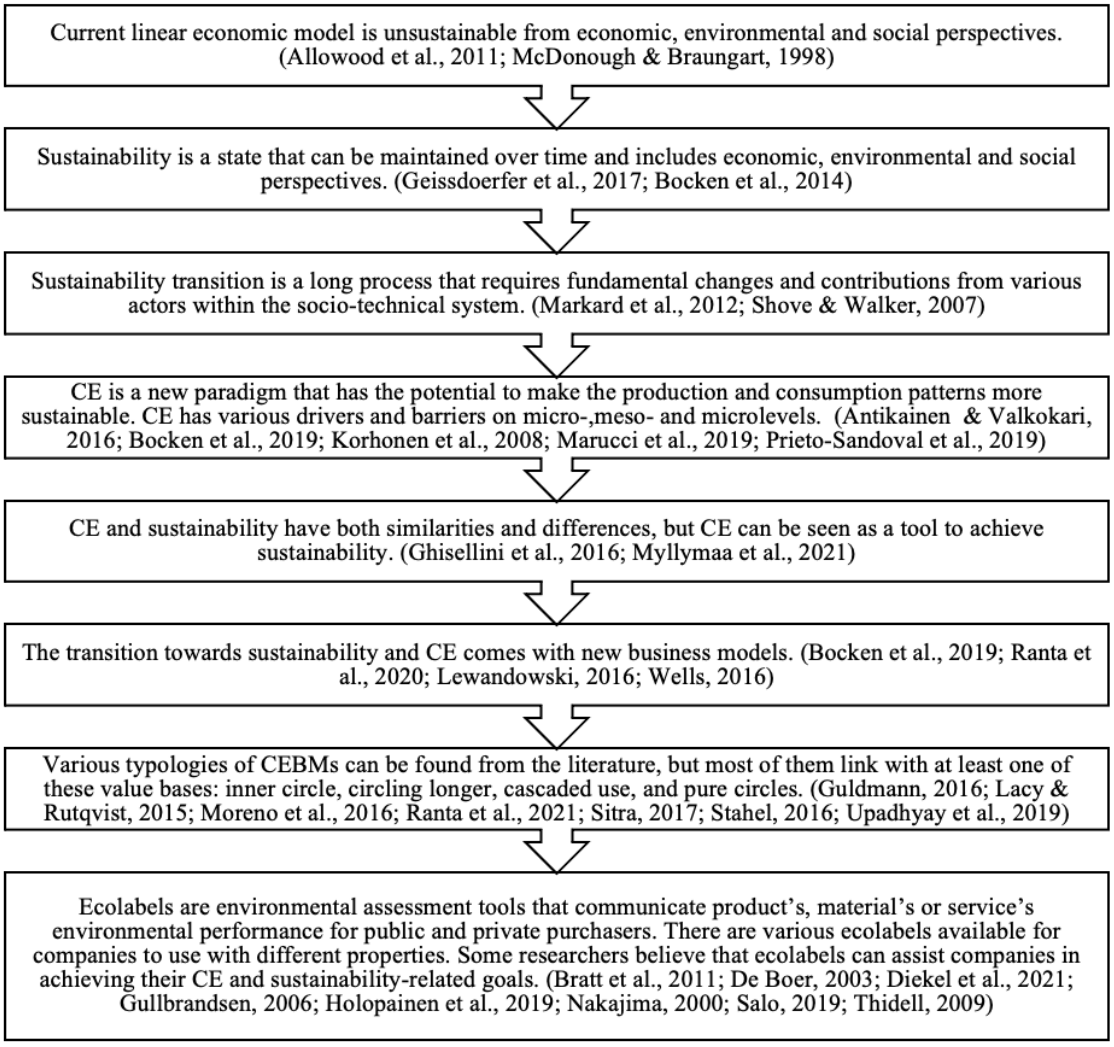

Figure 2: A tentative theoretical framework for the thesis

3 DATA AND METHODOLOGY

The following chapter introduces the methodology, scope, data collection and data analysis of the current study. Firstly, the methodological choices are described and validated. After which, the scope, contexts, and data collection methods are discussed. Lastly, the data analysis will be explained.

3.1 Research design and strategy

The current study's research approach is an empirical survey. The chosen approach is a quantitative study method. Mazzanti et al. (2016) explain that conducting surveys on companies can provide valuable information about the companies environmental performance and policies. Quantitative methods can be used to make sense of a data set's trends and connections (Hair et al., 2015). The quantitative study method explores phenomena with numerical data and tests theories with statistical analysis (Saunders et al., 2009; Watson, 2015). The thesis follows primarily deductive logic.

Numerical data can be collected via, for example, a survey. A Survey is a method that can be used to transform attitudes and beliefs into quantitative data (Muijs, 2010). The current study is a cross-sectional study. The cross-sectional study method is suited for the present study as the aim is to get a current perspective on the topics on hand, via a one-off survey, instead of using longitudinal study methods (Muijs, 2010). With cross-sectional surveys, no true causalities can be detained as the results are based on the current opinions and perceptions of the respondents (Levin, 2006).

3.2 The scope of the research

The scope of the thesis will be explained in three different sections. First, the context of Finland will be explained, after which the context of the chosen CE and sustainability company listings will be explained, and lastly, the ecolabels that were used as part of the survey will be introduced.

3.2.1 Context of Finland

Globally and in Finland, urbanization, increasing environmental consciousness, climate change, population growth, and gentrification provide challenges and opportunities (Sitra, 2016; Valtioneuvosto, 2019). The Finnish government has also committed to making Finland a global CE forerunner country by 2025 and a socially, economically, and ecologically sustainable Nordic welfare society by

2030 (Sitra, 2016; Valtioneuvosto, 2019). According to Sitra (2016), various initiatives and actions are required for Finland to achieve its goal to be a CE forerunner country.

As a country that requires new economic growth, the CE provides excellent opportunities for Finland. The government has an essential role in setting the scene so that companies can find it easy to make changes towards CE. In addition, companies themselves have essential roles in making changes towards CE in their operations and throughout their supply chain. Accessing global markets is also an essential part of the CE plan for Finland (Sitra, 2016). According to Sitra (2016), CE improves the competitiveness of Finnish companies. The improved competitiveness reflects the number of new companies, a new type of companies, increased financial benefits and innovations. Furthermore, the number of companies that aim for global markets will increase, more financial support is available, and companies can experience benefits from increased corporate sustainability (Sitra, 2016).

Finland is supposed to lower its emissions to 20,6 Mt CO_2- equivalent by 2030. The Paris agreement encourages Finland to keep aiming for lower emissions both short and long term. The Paris agreement urges for lowered emissions to balance out the CO_2 emissions and sinks by the end of the decade (Ympäristöministeriö, 2016). In the long run, Finland aims for carbon neutrality. The European Union also has a long term goal of lowering CO_2 emissions drastically by 2050. The goals set by European Commission also have a considerable effect on the goals that Finland has on lowering emissions (Ympäristöministeriö, 2016).

Finland can faces challenges in transitioning towards CE. Some of the challenges are the weak ability to take risks and lack of understanding from consumers. Moreover, the ageing population and increasing levels of unemployment are putting pressure on society (Sitra, 2016). However, Finland also has many advantages that will ease the transition towards CE, such as a strong recycling culture, historical capability for standing paucity, resource efficiency, and understanding product quality. Moreover, the small population, a sound schooling system, and the Finnish tendency for law-abiding are also factors in advantaging the transition. Finland has a strong standing in technology and digitalization related know-how. Furthermore, as Finland is a small country, it makes cross-sectoral collaboration easier. Finland has advance material efficiency technology that will be beneficial in CE transition (Sitra, 2016). Finland has a vital role in global communication about climate issues and acting as an example for others (Valtioneuvosto, 2019).

Around 70% of Finland's carbon footprint comes from household consumption. The household consumption rates in Finland are high even globally. However, Finns are increasingly concerned about the state of the climate. Salo et al. (2016) suggest that increased knowledge, support actions and motivation could help Finns towards more sustainable behaviour. Especially information is required in order for consumers to make more educated consumption decisions (Salo et al., 2016). It has been found that 90% of Finnish consumers would like more information about product carbon footprints (Hartikainen et al., 2014).

In order to carry out the required changes towards CE, the entire society needs to commit to the process changes are needed (Sitra, 2016). Finnish companies were chosen as the subjects of this research based on Finland's potential in CE, goals for lowering emissions and the potential that Finnish companies have in achieving the goals and providing consumers with sustainable options. The focus was narrowed to only Finnish companies to focus on the current situation in Finland in depth.

3.2.2 Context of used sustainability and circular economy company listings

After it had been decided that the focus area of the current study would be Finland, research of Finnish companies with circular business models and sustainable focus begun, the current study aimed to find public listings of companies exceeding in their sustainability and circular economy efforts. Several listings were found on the internet, inspected, and the authors of some listings were contacted to gain more information about the listings and the entrance criteria. The current study ended up choosing two listings that corresponded well with the needs of the study. The two listings that were chosen are Sitra's list of "The most interesting companies in the circular economy" (Sitra, 2019) and FINIX project's list of "Sustainable textile industry trailblazers" (FINIX, 2019).

Listings were focused on instead of picking separate companies because the companies on the listings had already passed specific criteria to make it to the listings. People outside the organizations formed the listings. Therefore the listings were perhaps more reliable than choosing companies that do not have their sustainability or circularity assessed by people outside the company. Choosing the specific listings instead of all available listings on the internet provides conservativeness for the group of frontrunners. However, the study does not claim that all sustainability and circular economy forerunner companies from Finland were on the chosen listing. The aim was not to have everyone included but rather have a good representation of such companies. In total, the author contacted 214 companies from the two listings to participate in the survey. Between the two listings chosen, there are companies from a variety of different industries. The industry was not a factor in choosing companies. Instead, the commitment to either circular economy, sustainability or both was important.

Based on the application to get on Sitra's list, the list focuses on finding companies that have been able to find circular economy based solutions for an environmental sustainability-related issue within their operations. The circular economy-related solutions assist with organizational sustainability, the organization as a whole, and the organization's customers (Sitra, 2019). Each company on Sitra's list has a circular economy business model (Sitra, 2019). FINIX-project's list, on the other hand, analyses an organization's sustainability based on three categories production, services, and organizational culture (FINIX, 2019). Each of the three categories has subcategories of sustainability and circularity related actions that are either part of the organization's operations or not. For production, the subcategories include significant use of recycling and excess materials, manufacturing in Finland, and manufacturing within proximity to Finland (Baltics

and Nordic countries). For services, the subcategories were repair services, take back scheme, and rental services. For organizational culture, the subcategories included an open value chain and set plans and actions to ensure product longevity (FINIX, 2019).

3.2.3 The ecolabels used in the survey

For the current study, an array of ecolabels were investigated. Table 3 below lists the labels that were found to be relevant for the range of companies included in the study and the region that the companies tend to carry out their operations. As ecolabels have been challenging to compare with one another, Minkov et al. (2019) found 22 attributes that can be used to compare ecolabels. The attributes were used to compile the table below. The information for the table was collected from Minkov et al. (2019), the Ecolabel Index website, and the websites of the respected ecolabels. Unfortunately, the information was at times hard to come by, even from the ecolabels' websites. Furthermore, sometimes the information that was found was also challenging to understand. Therefore, it is essential to note that the author does not claim that the information on the table is 100% correct.

Ecolabel	*Type I*	*Third party verification*	*Awarding format*	*Single / multiple product groups*	*Single / multiple issue focus*	*Governance*	*Life cycle focus*	*Geographical scope*
BCI	No	Yes	Seal	Single	Single	NPO	No	International
B Corporation	No	No	Seal and rating	Multiple	Multiple	NGO	No	International
Biodegradable products institute label	No	Yes	Seal	Multiple	Single	NPO	No	International
Blue Angel Label	Yes	Yes	Seal	Multiple	Multiple	Governmental	Yes	International
Blue Sign	No	No	Seal	Single	Single	PFP	No	International
Bra Miljöval ”Good Environmental Choice”	Yes	Yes	Seal	Multiple	Multiple	NPO	Yes	Regional
BREEAM	No	Yes	Seal	Single	Multiple	NPO	No	International
CarbonNeutral	No	Yes	Seal	Multiple	Single	PFP	Yes	International
Carbon Trust Footprint label	No	Yes	Seal	Multiple	Single	NPO	Yes	International
Cradle to Cradle Certified (CM) Products Program	No	Yes	Seal and rating	Multiple	Multiple	NGO	No	International
Energy Star	No	Yes	Seal	Multiple	Single	Governmental	No	International
EKOenergy	No	Yes	Seal	Single	Single	NPO	No	International
EU Ecolabel	Yes	Yes	Seal	Multiple	Multiple	Governmental	Yes	Regional
EU Energy Label	No	Yes	Rating	Multiple	Single	Governmental	No	Regional
GOTS	Yes	Yes	Seal	Single	Multiple	NPO	No	International
Leadership in Energy and Environmental Design (LEED)	No	Yes	Seal and rating	Single	Multiple	NPO	Yes	International
The Finnish Organic Association – The ladybird label	No	Yes	Seal	Multiple	Single	NGO	No	National
Finnish Organic	No	Yes	Seal	Multiple	Single	Governmental	No	National
EU Organic Products Label	No	Yes	Seal	Multiple	Single	Governmental	No	Regional
Programme for the Endorsement of Forest Certification (PEFC)	No	Yes	Seal	Multiple	Single	NGO	No	International
Rainforest Alliance	No	Yes	Seal	Multiple	Single	NPO	No	International
Roundtable on Sustainable Biomaterials	No	Yes	Seal	Multiple	Multiple	NPO	No	International
SCS Recycled Content Certification	No	Yes	Seal	Multiple	Single	PFP	No	International
TCO Certified	Yes	Yes	Seal	Multiple	Single	NPO	Yes	International
Forest Stewardship Council (FSC)	No	Yes	Seal	Single	Multiple	NPO	No	International
The Nordic Swan Ecolabel	Yes	Yes	Seal	Multiple	Multiple	Governmental	Yes	International
Öko-Tex labels	No	Yes	Seal	Single	Multiple	NPO	No	International

Table 3: The ecolabels used in the thesis.

3.3 Data collection

Here the data collection methods will be discussed in detail. First, the survey as a data collection method will be explained. After which, the thesis' survey structure will be described.

3.3.1 Survey as a method

The survey prepared for the thesis had both close- and open-ended questions. However, for the current research, only the close-ended questions were considered in the analysis as the open-ended questions will be utilized later on in a PhD study. Therefore, the data collected for the current study was received from structured questions on the survey well suited to gain information from a large group of companies or individuals (Hair et al., 2015; Saunders et al., 2009; Sapsford, 2006).

The survey type was a self-administrated online survey. The survey was created on an online platform called Webropol. The benefit of a self-administrated online survey is that the respondents can answer the survey at any time until the survey closes (Mujis, 2010). Moreover, self-completion surveys can be entirely standardized (Sapsford, 2006). In online surveys, there are different ways to invite the respondents to the survey. Each respondent got the same link in the current study, but personal links can also be used. Using a shared invitation link provides an additional level of privacy for the respondents. However, the downfall is that the respondents cannot leave and return the survey without losing their previous answers. However, each participant could access the survey as many times as they wished.

In surveys, questions must be able to do all the work by themselves as no outside assistance is available. Therefore, it is critical to pay much attention to designing the questions. Questions need to be precise and unambiguous, and phrased so that the answerer will not have to think about the point of the question (Sapsford, 2006). Furthermore, possibilities for standardization of questions and answers are an essential part of a well-designed survey. The phrasing and content of the questions require careful consideration to make the survey experience pleasant. Moreover, the formatting of the question is an integral part of getting reliable results from the survey (Sapsford, 2011).

Some benefits of online surveys include that online surveys automatically conduct data collection and are very affordable. In addition, the questions in the online surveys are uniform for all, but different questions can be provided for participants based on previous answers (Sapsford, 2011). Routeing makes the answering experience more pleasant for the respondent as repetition and contradiction can be avoided. Moreover, routeing can also be used to prompt, which means getting more depth for answers by providing an additional question about the same topic based on the respondents' previous answer (Sapsford, 2006).

Perhaps the most significant disadvantage of online surveys is that the respondent will have to rely on their instincts in understanding the questions, as

no assistance is available. Therefore, survey answers can include incorrect information (Sapsford, 2006). In addition, surveys might suffer from low response rates. The low response rates might be caused by, for example, technical difficulties. Surveyed companies might also get numerous contacts from different people asking them to participate in surveys which might cause frustration and unwillingness to participate in the survey. Respondents can also have concerns about staying anonymous or having a limited timeline to submit their answers (Mujis, 2010).

3.3.2 Survey structure

Literature was extensively reviewed before formatting the survey in order to increase the legitimacy. The phrasing of the questions and the answer options were based on the theoretical determinants of, for example, CE literature (examples of used sources: Bocken et al., 2016; Sitra, 2019; Ellen MacArthur Foundation, 2013), corporate sustainability literature (examples of used sources; Baumgartner & Rauter, 2017; Murray et al., 2017), and ecolabel literature (examples of used sources: Lozano et al., 2010; Bratt et al., 2011; Minkov, 2020). The list of ecolabels used in the survey was mainly based on the Ecolabel index website. The CEBMs on the survey were based on the CEBMs that have been used by, for example, Sitra, 2017; Moreno et al., 2016 and Guldmann, 2016, amongst others. The background question about the companies industries was a readily formatted list from the Statistics Finland website. The survey structure was also formatted based on literature (examples of used sources: Mujis, 2010; Sapsford, 2006).

The survey template was the same for each respondent. The template can be found in the Appendix in English, but a Finnish version was also available for the respondents. Although only Finnish companies were surveyed, the English version was provided if the person answering the survey was more comfortable answering in English. A trial run was conducted for the survey before sending it out to the companies. After the trial run for around 20 people, the survey was readjusted according to the feedback received. The trial run of the survey was sent to a diverse group of people. The group included native Finnish and English speakers, people who are highly familiar with the survey themes, people who work in large companies, students, and people who are familiar with surveys and statistics. The trial run was conducted to make sure that everyone would understand the questions in the same way and be able to answer the survey with no issues despite their backgrounds.

The survey had 39 questions (questions 40-42 asked for feedback and contact details for attending another study) in total spread out on to eight pages. The different pages had questions about different themes: sustainability, circular economy, sustainability and circular economy, ecolabels, ecolabels and circular economy, background information, last page for feedback. As mentioned previously, a beneficial trait of online surveys is that all respondents do not have to answer all questions. 14 questions were compulsory, four of which were the background questions. The survey was designed to be easy to answer to keep the

respondents interested and motivated throughout the survey. For example, a progress bar was included.

All the questions analyzed for the current study were narrowly focused, close-ended questions, as such questions are well suited for gaining numerical data for quantitative research. The questions had answering options that ease both the answering process and the process of comparing the answers (Sapsford, 2006). The close-ended questions also provide more straightforward comparability between the Finnish and English versions of the survey. In addition, "other" options were provided when relevant. However, it has been found that respondents tend to often choose an option from a readily formatted list of options rather than provide their own answer (Muijs, 2010; Andres, 2012).

The survey questions were both objective and subjective. Examples of the objective questions are the background questions. The subjective questions aimed to find out the companies opinions on the issues at hand, for example, perspectives on ecolabel drivers. The questions were both nominal and ordinal. However, more nominal questions were present. Nominal questions cannot be ranged in a natural order. Ordinal questions have a precise scale from, for example, strongly agree to disagree strongly, and the respondent can place themselves on the scale depending on how they feel (Dillman et al., 2014). For most of the ordinal questions, the option of "not important at all" included "not relevant" as well, which was challenging in terms of the analysis but provided the respondents with an easy choice if they did not know much about the topic. Some questions also included an "I do not know" option to make the answering process easier for the respondents. However, providing the "I do not know" option also hinders the analysis and therefore, it was included as little as possible.

In addition to preparing the survey, the author also prepared an invitation letter, two reminder letters, a privacy notice form, and a research notification form. The invitation letter and the link for the survey were emailed to 214 companies on the 22nd of February. Reminder messages were sent on the 9th of March and finally on the 12th of March. The 12th of March was the last day to respond, and, therefore, the companies had three weeks in total to submit their responses. The introduction letter included an introduction to the topic, who was conducting the survey, information about the second user of the data and their research, and explained how answering the survey would contribute to collecting meaningful information. The letter included both Finnish and English versions of the text. From the trial runs, it was estimated that the answering would take around 15minutes. That was also stated in the letter.

3.4 Data analysis

SPSS 27.0 programme (IBM Statistical Package for the Social Sciences) was used to conduct the statistical analysis process. The raw data was imported from Webropol to SPSS to find correlations and significances from the data. Webropol readily provides the frequencies and percentages for the data. Before importing

the raw data from Webropol to SPSS analysis, an analysis plan was prepared. The first process was to clean up the data in variable view to make the analysis process more pleasant. Some of the questions were then formed into multiple response categories.

The analysis focused on comparing the answers given by different respondents and finding out whether significant differences could be detected. The comparisons were made based on the background questions in order to make sense of the different answers. The number of responses was relatively small (n=39), limiting what analyses could be conducted with the data. The primary analyses used included the Mann-Whitney U-test, the Spearman's rank-order correlation coefficient test, the Kruskal-Wallis one-way analysis of variance and cross-tabulations. These analyses were chosen as the best suited for the data set of the current study (Sapsford, 2006).

Mann-Whitney U test was a suitable choice for the current study as it can be used for smaller samples, it is a nonparametric test and requires no normal distribution. The Mann-Whitney U test operates by comparing the means of two samples within a population and therefore analyzing their dependency (Saunders et al., 2009). The Spearman's rank correlation coefficient test is a nonparametric test that is again suited for the current study as it can be used to find correlations from smaller samples. Spearman's correlation measures the strength of the relationship between two variables. Like the other tests, Kruskal-Wallis one-way analysis of variance is a nonparametric test that measures the variances between different groups. The test can be used for two or more than two groups (Saunders et al., 2009).

4 RESULTS AND ANALYSIS

The presentation of the thesis results begins by introducing the background information of the respondents. After which, the respondents' commitment to CE and sustainability will be demonstrated. The usage of ecolabels within the surveyed companies and the respondents' interest in obtaining ecolabels in the future will be assessed, followed by presenting whether or not the respondents require ecolabels from their value chains. Then the ecolabels that the respondents and their value chain use will be introduced. After which, the results for ecolabel drivers and barriers will be assessed. Lastly, the respondents' view of the relationship between ecolabels and the circular economy will be presented.

4.1 Background information

The response rate for the survey was 18%. The background questions revealed that 79% of the respondent companies could be classified as small and medium enterprises (SMEs). SMEs are companies that have less than 250 employees and have a turnover of fewer than 50 million euros, or a balance sheet total is less than 43 million euros (European Commission, n.d.a). More specifically, as presented in figure 3, just over 50% (n. 21) of the respondents had less than ten employees or no employees at all. In contrast, 13% (n. 5) of the companies had more than 250 employees. In terms of annual revenue, as presented in figure 4 from the respondents, 80% (n. 31) have annual revenue of fewer than 10 million euros. While, the most common amount of annual revenue amongst the respondents was less than 100 000 euros, which 28% (n. 11) of the respondents reported having.

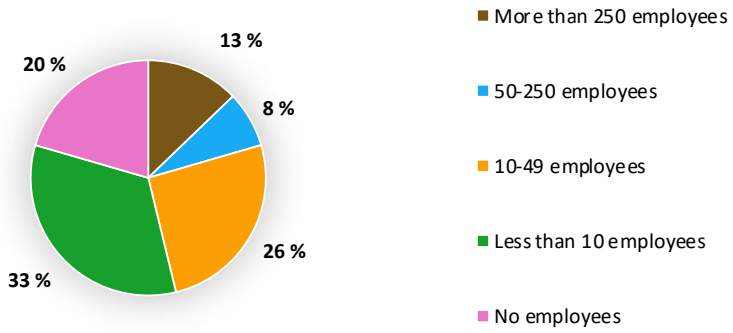

Figure 3: The number of employees within the surveyed companies.

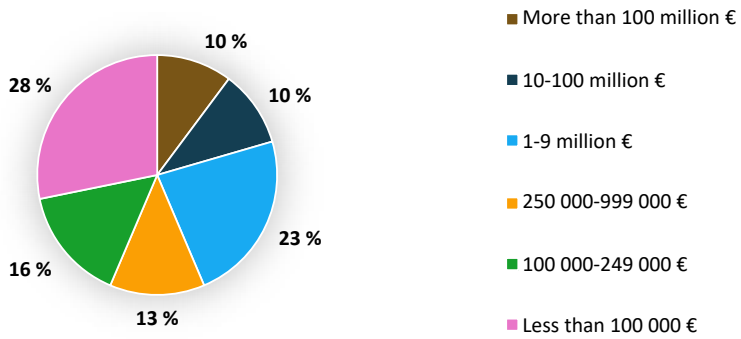

Figure 4: The annual revenues of the surveyed companies.

Figure 5 below presents what kind of industries the respondents represent. The largest group, or 26% (n. 10) of respondents, reported belonging to the wholesale and retail trade industry. The exact amount of respondents, 26% (n. 10), reported that they belonged to an unmentioned or unknown industry. The open answers for the unmentioned or unknown industry were reviewed, and most of the respondents were from the textile industry, which means that amongst the respondents textile industry was the most represented industry. In addition, 21% (n. 8) of the respondents reported manufacturing as their industry.

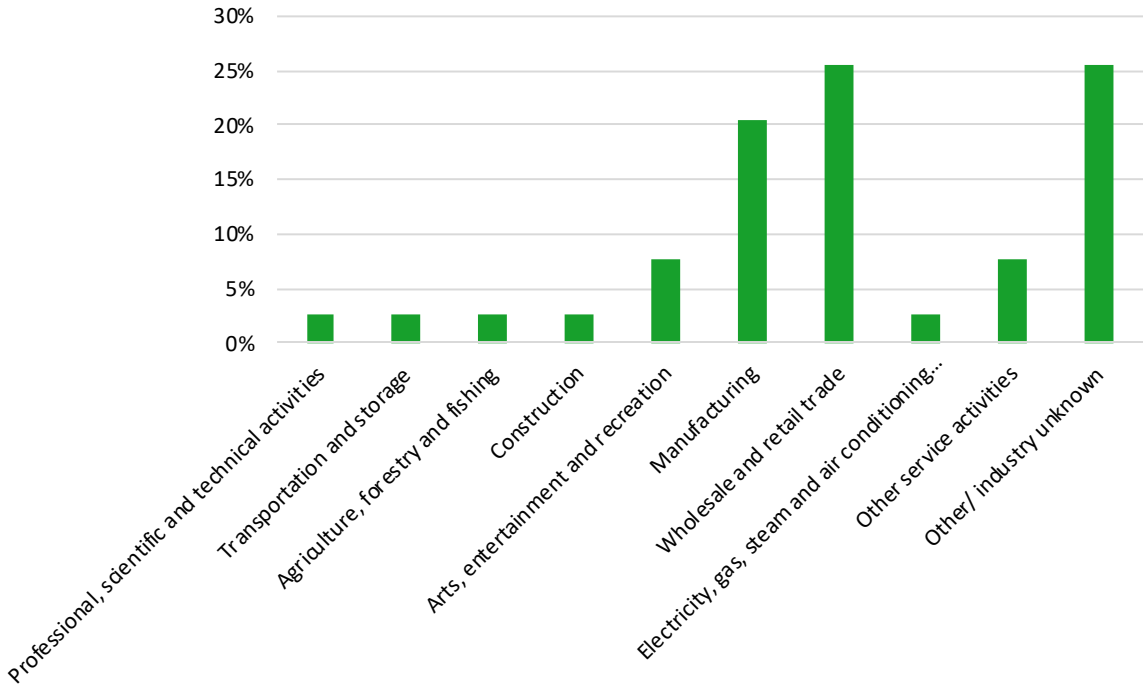

Figure 5: The industries of the surveyed companies.

Finally, the background questions also aimed to understand the type of product that the respondent companies have. Figure 6 below presents the answers to the product type question. 67% (n. 26) of the respondent companies had a physical product. 28% (n. 11) had both a physical product and an intangible service. Only 5% (n. 2) of the respondent companies had intangible service as their product type.

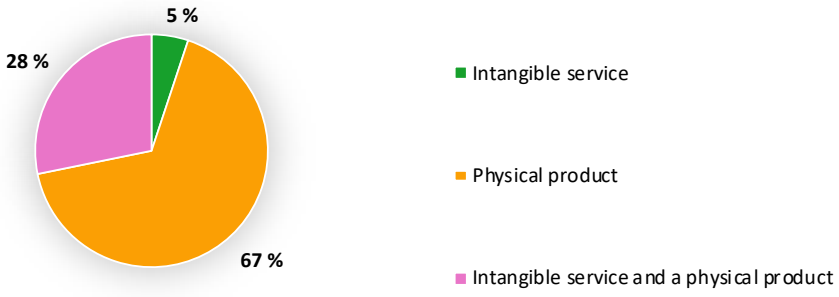

Figure 6: The product types of the surveyed companies.

4.2 The companies' commitment to circular economy and sustainability

Figure 7 below presents how respondent companies reported their commitments to sustainability and circular economy regarding their vision, mission and strategy. 77% (n. 30) of the companies reported that sustainability is an integral part of their vision. 69% (n. 27) of companies reported that sustainability is an integral part of their mission. 77% (n. 30) of the companies reported sustainability as an integral part of their strategy. Finally, only one respondent company did not have sustainability as an integral part of their vision, mission or strategy. In terms of CE, 69% (n. 27) of the companies reported that CE is an integral part of their vision. 54% (n. 21) of companies reported that CE is an integral part of their mission. 72% (n. 28) of the companies reported CE as an integral part of their strategy. Lastly, similarly to the sustainability question, only one respondent company did not have CE as an integral part of their vision, mission or strategy.

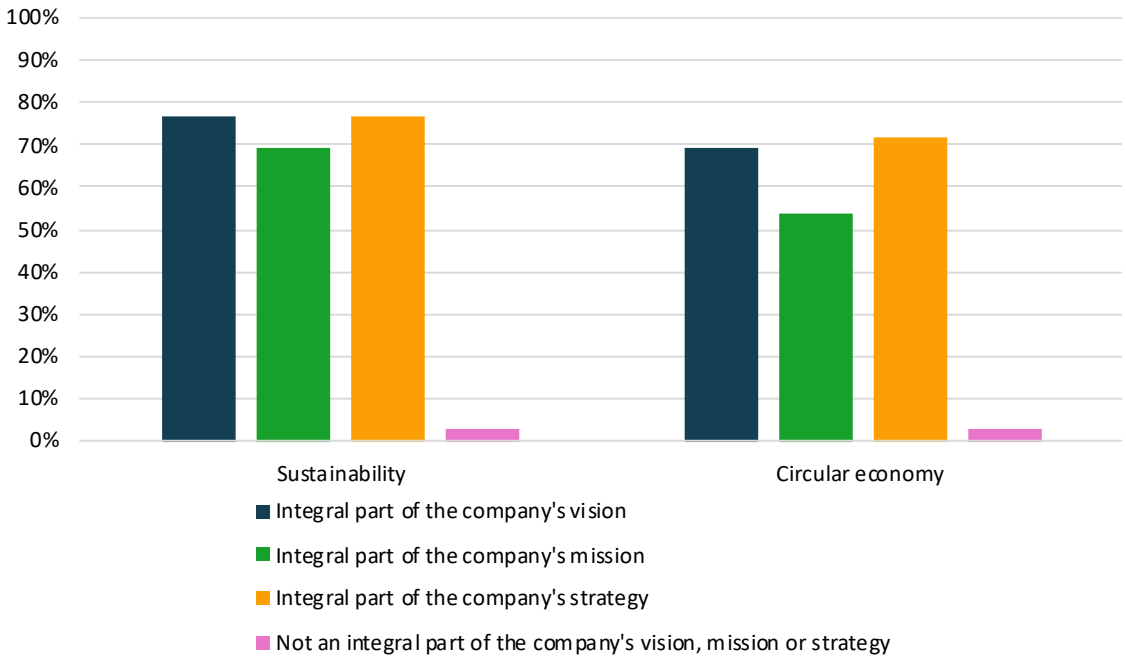

Figure 7: The surveyed companies' commitments to sustainability and circular economy.

A crosstabulation was conducted to gain further information about how different respondents' answers compared between the integration of sustainability and CE. The crosstabulation revealed that the same respondent who reported that CE is not an integral part of the company's vision, mission, and strategy was the same respondent who reported that sustainability was not an important part of the company's vision, mission, and strategy. Therefore, 38 out of 39 companies had committed to CE and sustainability on some level within their vision, mission and strategy. The current study found no significant differences between the answers given by respondents with different backgrounds.

In addition to the vision, mission and strategy, the respondents' commitment to CE and sustainability were also examined based on the respondents recorded environmental responsibility related actions. Figure 8 below presents how the respondents divide between their commitments for the environmental responsibility related actions. It was found that 31 out of 39 respondents were committed to at least one of the mentioned actions. The respondents' most popular environmental responsibility related action was environmental objectives, which 20 respondents were committed to.

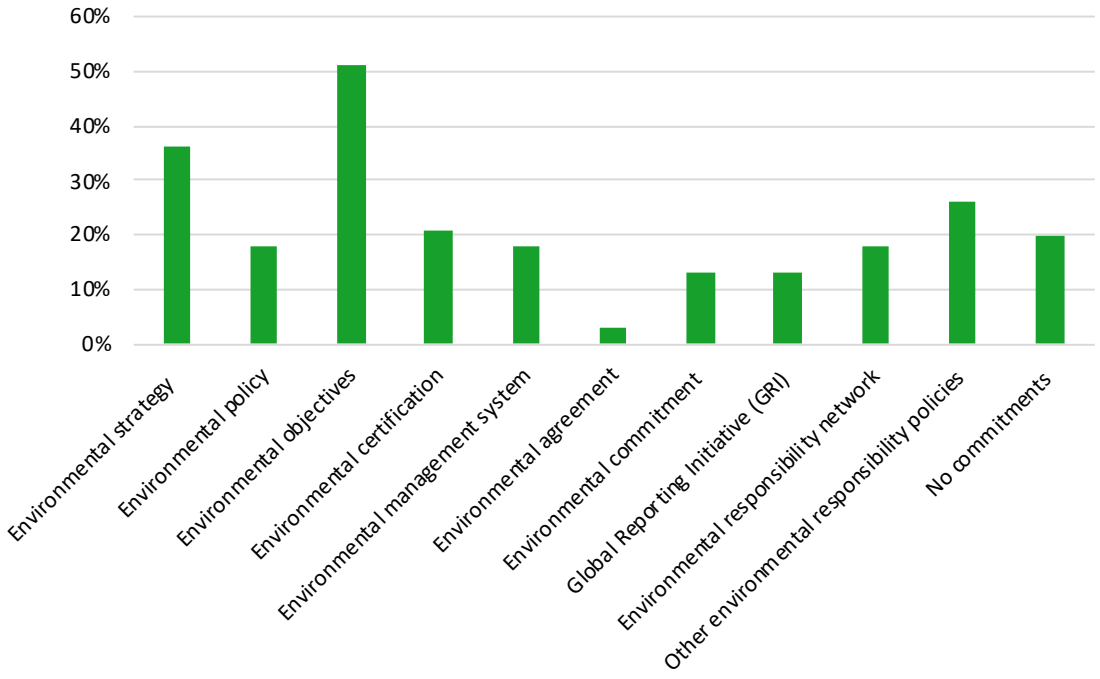

Figure 8: The surveyed companies' environmental responsibility related commitments.

Finally, the last way to measure the respondents' commitment to CE was to determine the respondents' business models. As presented in figure 9, 95% (n. 37) of the respondents have a CE related business model, while only 5% (n. 2) respondents reported having a linear economy-related business model. The most well-represented CE business model was the product-life extension model that 69% (n. 27) of respondents reported having. The current study found no significant differences between the answers given by respondents with different backgrounds.

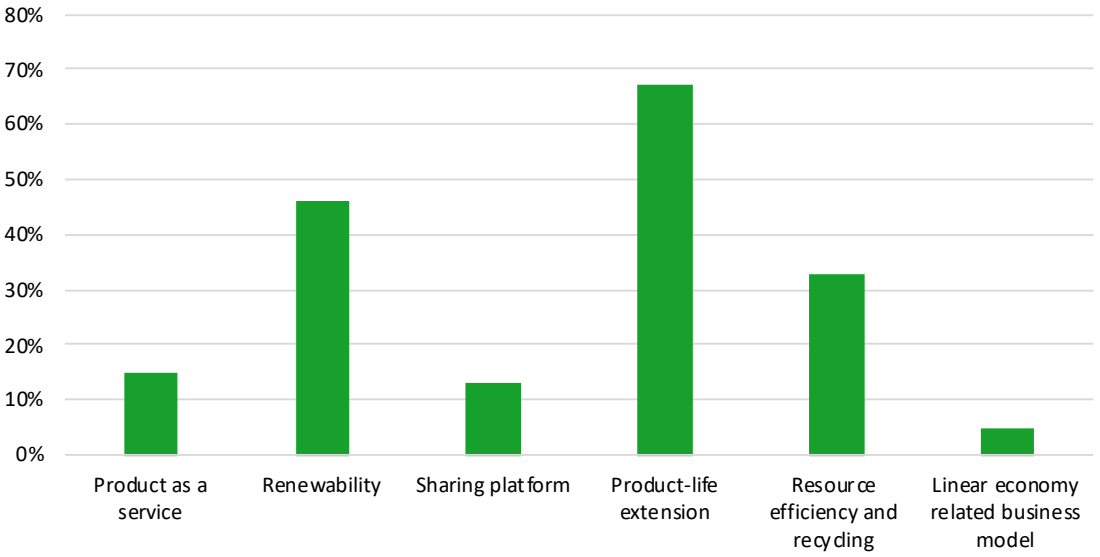

Figure 9: The surveyed companies' business models.

4.3 The usage of ecolabels among the surveyed companies

Based on the survey results, only 23% (n. 9) of the companies have either their products or services ecolabelled, while the majority of companies, 77% (n. 30) of the companies, did not have ecolabels in use. A Mann-Whitney U test was also conducted in SPSS to determine whether or not respondents with different backgrounds provided significantly different answers for having ecolabels in use. The Mann-Whitney U test was conducted between whether or not the company had an ecolabel in use and background variables industry, employees, annual revenue and product type. The tests found no significant differences between the answers for whether or not the companies had ecolabels in use and the answers for the background variables.

In order to present a more holistic picture of the respondents' perspectives on ecolabels, the survey asked whether or not the companies aimed to get new ecolabels. The study found that only 5% (n. 2) of the respondents aimed to get new ecolabels, whereas 51% (n. 20) were not interested in obtaining new ecolabels, and 44% (n. 17) did not know if the company was aiming to get new ecolabels or not. A series of Kruskal-Wallis Tests were conducted to determine whether or not there were significant differences between the answers by different respondents. No significant differences were detected between whether or not the companies aimed to get new ecolabels and the background variables of annual revenue, employees, industry, and having previous ecolabels.

4.3.1 The usage of ecolabels within the companies' suppliers

In addition to the information of the companies, ecolabel use the current study was also interested in finding out how important it was for the respondent companies that their suppliers used ecolabels, other certifications, environmental product declarations or environmental management systems. It was found that 36% (n. 14) of the respondent companies require ecolabels, other certifications, environmental product declarations, or environmental management systems from their suppliers, whereas 49% (n. 19) do not require any of these, and 15% (n. 6) did not know whether or not the company requires any of these. Moreover, 23% (n. 9) of the respondents reported that they require ecolabels from their suppliers.

In addition to the percentages described above, the study was interested in figuring whether or not any significant differences could be found from the respondents' answers for whether or not the companies require ecolabels, other certifications, environmental product declarations, or environmental management systems from their suppliers, A series of Kruskal-Wallis Tests were conducted, the respondents' answers were compared with variables of, company's own ecolabels, industry, employees, annual revenue and product type. No significant differences were found in any of the tests.

4.3.2 The ecolabels used within the companies and their suppliers

The study aimed to determine which ecolabels were most used amongst the respondent companies and their supply chains. Table 4 below presents the frequencies and percentages of the ecolabels that the respondents selected. Four of the nine respondents that recorded having ecolabels had GOTS in use. Similarly, four of the nine respondents had Öko-Tex labels in use.

Ecolabel	*n. (out of 21 selected answers, 9 respondents)*	*% of 21 selected answers and 9 respondents*
Blue Angel Label	1	11,1%
Carbon Trust Footprint label	1	11,1%
EU Ecolabel	1	11,1%
GOTS	4	44,4%
Organic labels (The Finnish Organic Association – The ladybird label, Finnish Organic, EU Organic Products Label, other organic labels)	1	11,1%
Programme for the Endorsement of Forest Certification (PEFC)	1	11,1%
Roundtable on Sustainable Biomaterials	1	11,1%
Forest Stewardship Counci (FSC)	1	11,1%
The Nordic Swan Ecolabel	1	11,1%
Öko-Tex labels	4	44,4%
We have developed our own responsibility label	1	11,1%
Other sector specific labels, what?	2	22,2%
Other labels, what?	2	22,2%

Table 4: The ecolabels used by surveyed companies.

Meanwhile, five out of nine respondents required that their suppliers have GOTS, and six out of the nine respondents required Öko-tex labels from their

suppliers. Tables 5 below present the frequencies and percentages of the ecolabels that the respondents required from their supply chain.

Ecolabels that companies expect from their suppliers	*n. (out of 24 selected answers, 9 respondents)*	*% of 24 selected answers and 9 respondents*
Blue Angel Label	1	11,1%
Blue Sign	2	22,2%
EKOenergy	1	11,1%
EU Ecolabel	2	22,2%
EU Energy Label	1	11,1%
GOTS	5	55,6%
Organic labels (The Finnish Organic Association – The ladybird label, Finnish Organic, EU Organic Products Label, other organic labels)	1	11,1%
Programme for the Endorsement of Forest Certification (PEFC)	1	11,1%
Forest Stewardship Counci (FSC)	1	11,1%
Öko-Tex labels	6	66,7%
Our suppliers have their own company-specific labels	1	11,1%
Other labels, what?	2	22,2%

Table 5: The ecolabels surveyed companies require from their suppliers.

4.4 The drivers for using ecolabels

The current thesis aimed to find out the most important drivers for introducing ecolabels into the organizations' operations. The respondents rated the given drivers one meaning, not at all important or not relevant, two meaning a little important, three meaning somewhat important, four meaning important, and five meaning very important. Between the readily provided reasonings, there was not much variation. As seen in figure 10, based on the medians, the most important drivers were found to be "encourage consumers to buy the company's products" (4), "gaining competitive advantage" (4), "increase the value of products" (4), and "increase the value of the company" (4). While based on the median,

the least important or not relevant driver was found to be "pressure from legislation" (1).

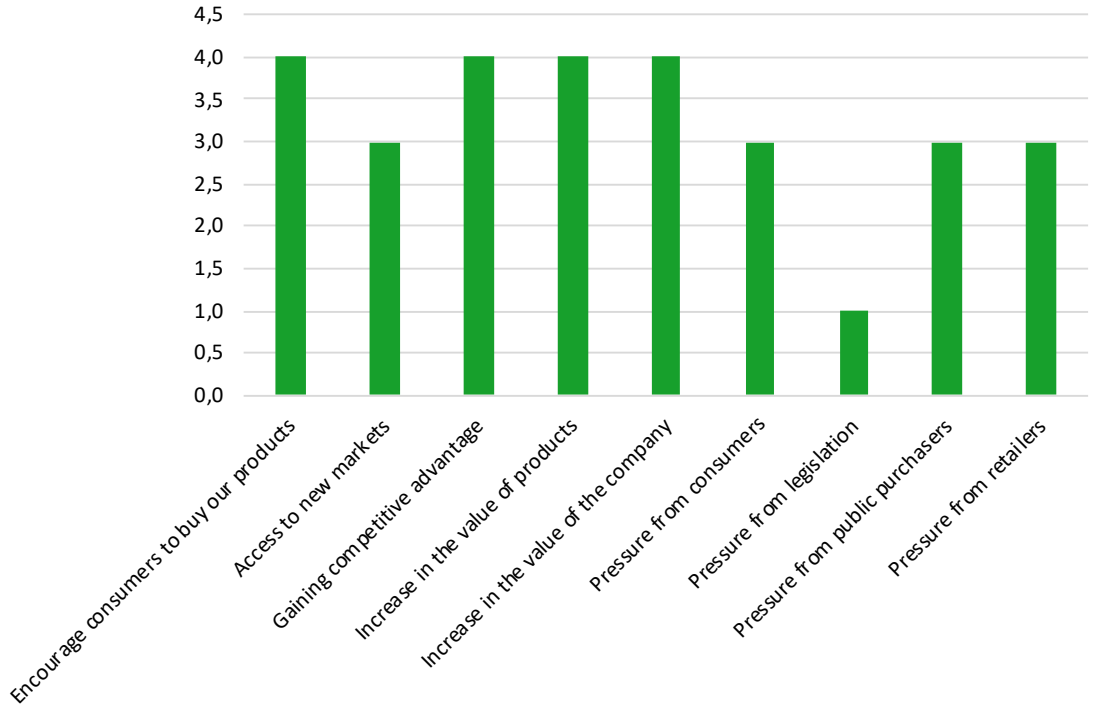

Figure 10: The drivers surveyed companies have for using ecolabels.

In addition to looking at the medians for the ecolabel drivers, Spearman's correlation tests were performed to determine if any of the variables would correlate with the background variables industry, employees, annual revenue and product type. The analysis revealed that there was a significant correlation between companies with many employees and large annual revenues and feeling strong pressures from retailers.

4.5 The barriers for using ecolabels

The current thesis aimed to find out the most important barriers for introducing ecolabels into an organizations operations. The respondents rated the given barriers one meaning, not at all important or not relevant, two meaning a little important, three meaning somewhat important, four meaning important, and five meaning very important. Based on the medians, the most important barrier was that the "cost of obtaining ecolabels is too high" (4). In addition, "there is no market demand for ecolabels" (3), "not enough competitive advantage", "the process of obtaining ecolabels is too long" (3) and "there is not enough evidence of the usefulness of ecolabels in attracting customers" (3) where found to be somewhat

important barriers. The least important barrier was the "lack of recognition from the public sector" (1).

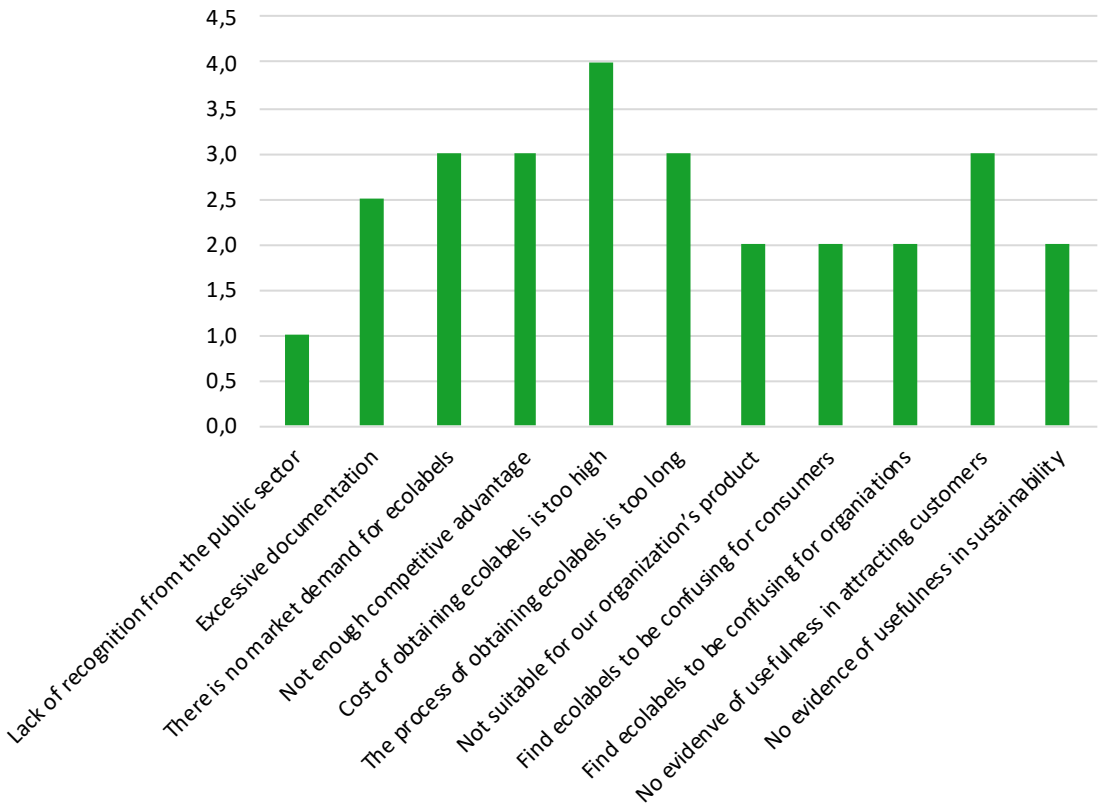

Figure 11: The barriers surveyed companies have for using ecolabels.

In addition to reviewing the medians for ecolabel barriers. Similarly to ecolabel drivers, Spearman's correlation test was conducted to determine whether or not any of the barriers correlated significantly with the background variables industry, employees, annual revenue, and product type. Companies with many employees were found to have significant correlations with "there is not enough evidence of the usefulness of ecolabels in sustainability" barriers.

4.6 The benefits and challenges of ecolabel use

In addition to examining the most important drivers for ecolabel use, the respondents with ecolabels were asked whether or not they had perceived any benefits from using ecolabels. Less than half or 44% (n. 4) of the respondents thought that ecolabels benefitted the organization. At the same time, 56% (n. 5) had found no benefits from using ecolabels. Furthermore, respondents with ecolabels were asked whether or not they had perceived any challenges in using ecolabels. 56%

(n. 5) of the respondents had detected some challenges in using ecolabels. While 44% (n. 4) had found no challenges in using ecolabels.

4.7 How the respondents perceive the relationship between ecolabels and circular economy

The respondents' perceptions about the relationship between ecolabels and CE indicate that out of the nine respondents (the companies with ecolabels), there was no shared opinion for which one of the answer options best describes the relationship between ecolabels and CE. As seen in figure 12, the answers are divided relatively evenly for each of the answer options. Two companies had perceived benefits from using ecolabels in achieving their CE goals. One company felt that ecolabels had hampered or slowed down their process of achieving CE related goals. Two companies did not perceive any correlation between ecolabels and their CE related goals. The rest of the respondents had other answers or were unable to answer the question.

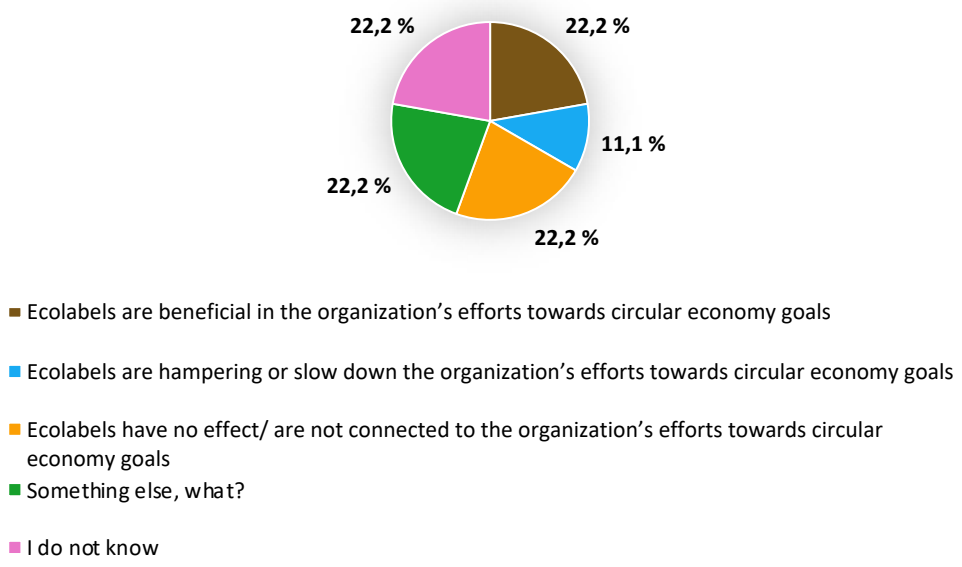

Figure 12: The surveyed companies' perceptions of the relationship between ecolabels and circular economy goals.

It was also discovered that 28% (n. 11) of the respondents use some kind of environmental assessment and improvement tools to advance their circular economy and sustainability goals. 54% (n. 21) of the companies did not use any tools, and 18% (n. 7) of the respondents did not know whether or not their company used tools to assist in achieving CE and sustainability-related goals. Figure 13 reveals all the tools that the respondents used to advance their CE related goals. Lifecycle analysis (n. 5), Carbon footprint (n.5) and environmental management

systems (n. 4) were found to be the most used tools by the respondents. Only one respondent recorded using ecolabels to advance their CE-related goals.

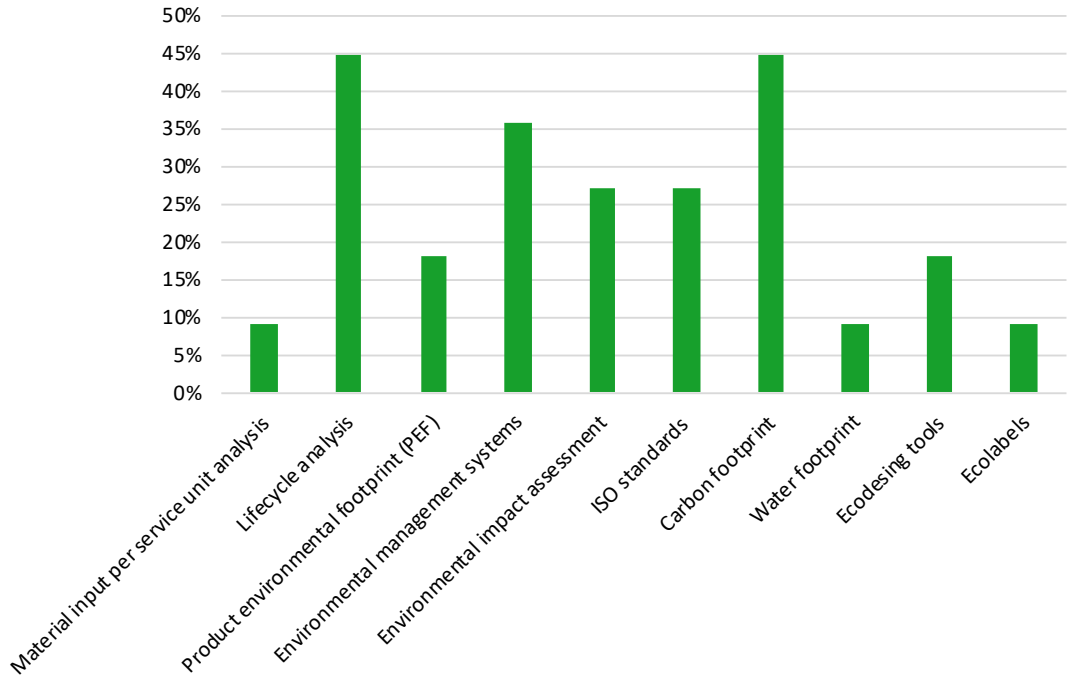

Figure 13: Tools the surveyed companies use to achieve their circular economy related goals.

5 DISCUSSION

5.1 The use of ecolabels within Finnish circular economy forerunners

Most of the respondents had recorded that CE and sustainability are integral parts of their vision, mission and strategy. All but two companies also recorded having CEBMs. It has been suggested in the literature that if a company does not have CE integrated to multiple levels of its operations, the company has not fully committed to CE (Kirchherr et al., 2018). Therefore, most of the companies on the listings can be considered to be fully committed to CE.

Based on the current study, the results suggest that most Finnish CE forerunner companies do not have ecolabels in use. Only 23% (n. 9) of respondents reported currently having ecolabels. Moreover, only 5 % of the companies communicated that they plan to obtain new ecolabels in the future. An explanation for these findings can perhaps stem from the large number of SMEs as respondents. The respondents of the current study were mainly companies with no employees to companies with less than 50 employees. The most represented annual revenue for the respondents was less than 100 000€.

Iraldo and Barberio (2017) discuss that especially SMEs can struggle to apply for ecolabels. Companies can feel that the required documentation for ecolabels is extensive and complicated to combine. Furthermore, obtaining ecolabels is laborious, but the process also requires many resources that small companies might not have (Iraldo & Barberio, 2017). Therefore, especially SMEs with only a few to no employees can find that it is not worth the effort to obtain ecolabels (Donatello et al., 2020).

Furthermore, as ecolabels are often used for communicative and marketing purposes (Iraldo & Barberio 2017), perhaps the respondent companies have found other more cost-effective ways of communicating their environmental performance for their customers. Logically, companies would only introduce eco-innovative products and services if it is financially beneficial (Triguero et al., 2013). According to De Boer (2003), whether or not a company wants to attain ecolabels, if sustainability is integrated into the corporate strategy, the company can gain benefits. In addition, according to Iraldo and Barberio (2017), the EU ecolabel license holders surveyed by the researchers perceived EU ecolabel not to be visible or amongst broader awareness within the market.

Although most of the companies did not have ecolabels within their operations, still 36% (n. 14) of the respondents reportedly require ecolabels, other certifications, environmental product declarations or environmental management systems from their suppliers. However, only 23% (n. 9) of the companies were interested in whether or not their suppliers had ecolabels. According to Winkler (2011), companies might find it easier to balance between economic gains and

environmental gains if they focus on supply chain sustainability more than sustainability on the company level. Furthermore, Winkler (2011) explains that companies can avoid causing adverse effects on the environment if they collaborate on design, production, sourcing and deliveries.

The survey presented the respondents with a list of 22 ecolabels. The most used ecolabels amongst the respondents and their suppliers were GOTS and Öko-Tex labels, which align with the influx of textile industry companies amongst the respondents. Similarly, with the thesis results, a study of Pakistani textile companies by Hayat et al. (2020) found that Öko-Tex labels and GOTS were also the most popular ecolabels used by the Pakistani textile companies.

In addition to GOTS and Öko-tex labels, the surveyed companies reported using 8 out of the other 22 ecolabels presented in the survey. As the other labels vary in terms of product groups and issue focuses, it suggests diversity between the industries that the respondents with ecolabels represent. Out of all the ecolabels that the respondents reported using, six are type I labels and four are other types, and all are the third party verified. Amongst the used ecolabels, the Blue Angel Label, the Carbon Trust Footprint Label, the EU Ecolabel, and the Nordic Swan Ecolabel have some level of lifecycle focus within their criteria.

5.2 Drivers for ecolabel use

The current study found that the most significant driver for obtaining an ecolabel was that ecolabels encourage consumers to buy the company's products. Similarly, Iraldo and Barberio (2017) found that one of the most significant drivers to obtain ecolabels is external pressure from consumers who are increasingly interested in environmentally friendly products. Furthermore, Iraldo and Barberi (2017) state that most existing studies agree that market requirements and societal pressures are the most significant reasons companies invest in eco-innovations. However, Iraldo and Barberio (2017) found that especially market pressure from customers and retailers was a vital driver for attaining the EU ecolabel, and by doing so, competitiveness and increased sales followed. As consumers are increasingly aware of environmental issues, attaining ecolabels can attract consumers and, therefore, achieve a competitive advantage and increased sales.

Kjeldsen et al. (2014) found that the Swan delivered consumer interest via communicating the company's environmental stands and that the biggest motivation for obtaining the Swan for the interviewed companies was increasing sales and taking action on external pressures from the market. External pressures were found to stem from customers and business partners. Bjørner et al. (2004) found in their study about the Swan's effects on Danish consumers that the Swan had a significant effect on the consumers. In addition, the study found that consumers might pay more attention to environmental information on products that are purchased regularly. The researchers suggest that the reason can be that consumers might feel that they are making a more significant environmental impact.

This thesis found that companies with many employees and significant annual revenues felt a lot of pressure from retailers to get ecolabels. The existing knowledge within the literature supports this finding. According to Daddi et al. (2016), it has been discussed in the literature that external pressures can act as drivers for implementing voluntary environmental strategies in companies. Furthermore, Iraldo and Barberio (2017) found that retailers have power in pressuring companies to get ecolabels. Testa et al. (2015) also found that retailers have much power in ecolabel promotion. Larger companies tend to experience more external pressures towards environmental actions, and therefore companies that are larger in size can hold external pressures as more critical drivers (Bansal, 2005).

Gaining a competitive advantage was also a significant driver for the respondents of the thesis. Kjeldsen et al. (2014) found that the Swan delivered companies with a competitive advantage as the companies were amongst the first companies to obtain the label. Similarly to the current study, Iraldo and Barberio (2017) found that 60% of EU ecolabel license holders that the study surveyed used the ecolabel as a tool to increase competitiveness and sales. On the contrary, the EVER study (2006) found that the most significant benefits delivered by EU Ecolabel were enhanced environmental performance while improvements of competitive performance followed. However, Iraldo and Barberio (2017) exclaimed that the situation had turned the other way around in just over ten years between the two studies.

The thesis respondents reported that increasing the value of their products was also an essential driver for getting an ecolabel. According to the EVER study (2006), EU ecolabel can assist companies in achieving increased profits and competitiveness. While changes in turnovers were hard to measure, respondents did not think that turnover related rewards were as big of drivers (EVER study, 2006). Ecolabels aim to increase the market shares of the labelled products (Bjørner et al., 2004). The respondents of the current thesis also kept the increased value of the company as an essential driver. Kjeldsen et al. (2014) found that companies wanted to obtain the Swan to promote their "green company profile" and surge their sales. Furthermore, the study found that companies considered the Swan as an approval stamp for significant environmental actions.

5.3 Barriers for ecolabel use

This thesis found that many companies thought the cost of the ecolabel obtaining process to be too high. Lozano et al. (2010) raised the cost of ecolabels to be one of the barriers that might harm ecolabels survival in the long run. Similarly, Kjeldsen et al. (2014) found that overall costs of the ecolabel implementation process and the application process itself were the most significant barriers for obtaining the Swan. Ecolabels cause both direct and indirect costs for companies. Indirect costs tend to be larger than the direct costs that are involved. It is chal-

lenging to form a holistic picture of all the costs involved in implementing ecolabels due to the multiple indirect costs involved. The amount of indirect costs also varies from a company to another. However, a typical indirect cost identified by companies is the increased amount of required person-hours to combine the documentation (Kjeldsen et al., 2014).

The license fee itself might not be the cost that acts as a barrier for attaining an ecolabel, but high costs are related to the process of demonstrating compliance with the required criteria (Iraldo & Barberio, 2017). Iraldo and Barberio (2017) found that the overall costs of the process were a barrier that was shared between all sizes of companies, and both licence holders and non-license holders. Furthermore, the study found that the costs also correlate with the extensivity and complicatedness of the required documentation to obtain and maintain the EU Ecolabel. According to Kjeldsen et al. (2014), when companies apply for the Swan, making changes in materials or other developments are necessary. Furthermore, according to the interviews conducted by Kjeldsen et al. (2014), some companies also had to make changes in their machinery or equipment, might have challenges in finding suitable suppliers, and the newly approved materials could be more expensive.

The thesis established that companies felt there was not enough evidence that ecolabels help to attract customers. According to Carmona (2011), consumers might not be educated enough about the ecolabel requirements and characteristics to trust the labels. That as a domino effect can cause a lack increase in sales after obtaining an ecolabel. Iraldo and Barberio (2017) found that most of the companies the study surveyed did not think that the concrete effects ecolabels had on company sales were satisfactory. Furthermore, there is a lack of information to back up the argument that consumers consider environmental information in their purchasing behaviour (Bjørner et al., 2004). Finally, most consumers should be better educated about environmental issues for ecolabels to work effectively and consumption patterns to turn into sustainable ones (Brécard et al., 2009).

Similarly to the current study's results, Iraldo and Barberio (2017) found that non-license holders raised stringent criteria requirements as an essential barrier not to get ecolabels. In addition, the amount of documentation, lack of recognition, and lack of public incentives were also significant barriers to attaining the EU ecolabel. On the other hand, license holders held extensive documentation, lack of external incentives, and lack of competitive improvements as the main barriers. Moreover, Kjeldsen et al. (2014) found that the documentation required for the ecolabel application process is time-consuming and challenging for companies. The documentation requires person-hours, communication with suppliers and subcontractors and a distinguished understanding of their operations. According to Iraldo and Barberio (2017), large license holder companies' most significant barrier was the complexity and volume of documentation. Lack of competitive paybacks was also a significant barrier for large license-holder companies. The current study also identified a lack of competitive advantage to be a significant barrier.

According to the thesis results, lack of recognition from the public sector was the least essential barrier for obtaining ecolabels. Much of the research on the field have detected contradictory findings. Iraldo and Barberio (2017) state that the lack of external incentives and lack of recognition by public institutions can be grouped. According to Iraldo and Barberio (2017), the lack of recognition by public institutions was a significant barrier. Furthermore, the EVER study (2006) found that non-license holders found the most significant barriers to be a lack of recognition from multiple external facets such as public institutions, consumers, retailers, costs, and lack of external support in the form of funding. Although legislation can help some companies within specific industries to improve their environmental compliance, in some cases, legislation can hinder companies transition towards sustainability (Papagiannakis et al., 2014).

5.4 Lack of benefits and presence of challenges in ecolabel use

An important finding from the current study is that less than half of the respondents had detected benefits in using ecolabels. Moreover, more than half of the respondents in the current thesis reported facing challenges when using ecolabels. Perhaps the benefits that ecolabels deliver are not transparent or easily measured and therefore hard to detect for companies. Perhaps companies feel that the obtaining process is challenging, and the possible benefits might not be as clear and defined as the companies would hope. Furthermore, lack of benefits can be challenging as obtaining ecolabels is a significant investment (Iraldo & Barberio, 2017).

When companies introduce ecolabels, they expect to be able to gain rewards. Rewards can be, for example, a higher price, better access to markets or competitive advantage (Iraldo & Barberio, 2017). However, sometimes the rewards are not visible, and that might be due to a few reasons. Kjeldsen et al. (2014) suggest that a reason for nonvisible benefits can be that a company does not track the costs and benefits of the label. If new products get labelled and no before data is available, or if the impacts are spread out to different company sectors and hard to combine, it is challenging to find any direct benefits. De Boer (2003) suggests that as ecolabels are generally an answer for pressures towards sustainability, some industries do not face as many pressures and, therefore, do not experience as many benefits from using ecolabels.

Lack of cohesion within ecolabel awarding criteria can cause the absence of sustainability-related benefits (Bratt et al., 2011). Moreover, the voluntariness or self-fondness of ecolabels can decrease the level of trust that consumers have for ecolabels. In comparison, mandatory labels are trusted more by the consumers (Horne, 2009) and might deliver more significant benefits. Also, the industry that a company operates in has a substantial effect on the impacts that implementing the label can cause. For example, if the company operates in an industry where the label is already a common industry standard, the company will most likely not receive a competitive advantage (Kjeldsen et al., 2014).

Benefits can also remain minimal if the ecolabel implementation process is not sufficient enough. A successful ecolabel implementation process requires companywide commitment. Managers and employees are all needed in order to make the changes. Management is often responsible for communicating the advantages of the new implementation for the employees and ensuring that the employees are motivated to make the required changes (Kjeldsen et al., 2014). Motivated employees are needed as changes often apply to the employees' daily tasks. Changes management plays an essential role in the ecolabel implementation process. Often the implementation process follows a top-down methodology (Kjeldsen et al., 2014). Stand-alone sustainability indicators do not hold enough power to deliver benefits for organizations by themselves. Supporting sustainability-related strategies, goals and priorities are also needed (Morioka et al., 2018).

Wagner (2008) mentions that a successful ecolabel implementation process might require a dialogue between the company using them and their stakeholders to make them effective and take the societal expectations into account. Bratt et al. (2011) agree that to gain benefits from ecolabels, stakeholder communication is required. Furthermore, policymakers must support and promote ecolabels to provide credibility for the ecolabels (Horne, 2009; Testa et al., 2015).

5.5 Ecolabels and circular economy as perceived by Finnish circular economy and sustainability forerunners

Based on the current study, companies have different perspectives on the relationship between ecolabels and the circular economy. Only 28% of the respondents reported using assessment and improvement tools to advance their circular economy and sustainability-related goals. Furthermore, the main tools that the respondents used to reach their CE-related goals were Lifecycle analysis (n. 5), environmental management systems (n.4) and Carbon footprint (n. 5). While only one respondent reported that the company uses ecolabels in order to achieve its CE-related goals.

As the views on ecolabels and circular economy's relationship are scattered amongst the respondents, it can perhaps be explained by the different ecolabels that the respondents use. Companies answered the survey from a variety of industries that use different ecolabels. Different ecolabels can consider the CE on different levels. Some ecolabels do not consider CE-related factors at all in their criteria. Based on the literature review, eight ecolabels out of the 22 ecolabels considered in the current thesis have some level of lifecycle focus within their criteria. As ecolabels can be found from all over the world and within various industries and product categories, ecolabels have different goals and purposes and vary from each other significantly (Minkov, 2020).

Kjeldsen et al. (2014) describe how different companies might receive different levels of material efficiency-related benefits from using the Swan. According to Myllymaa et al. (2020), CE has to be independently determined for different industries. The critical difference is between companies with the license for

their entire service operations or production and companies that only have the license for some of their products. If a company is fully licensed, the changes required are significant in terms of energy, water and waste. While companies with only one or few labelled products might still have increased efficiency, the changes are difficult to measure (Kjeldsen et al., 2014).

Furthermore, the environmental benefits of ecolabels depend on how much of the company's operations and products are ecolabelled (Iraldo & Bareberio, 2017). However, Iraldo and Barberio (2017) state that EU ecolabel affects companies' environmental performance, especially in terms of waste and recycling, efficient material use, and air and water emissions. EU Ecolabel users are also found to communicate that the label increased their knowledge on the environmental impacts of their products and services and helped them set targets for improving their environmental performance (Iraldo & Barberio, 2017).

Iraldo and Barberio (2017) found that the EU ecolabel license-holder companies attained holistic improvements in a company's environmental performance. However, the researcher speculated that perhaps companies were not expecting to achieve environmental benefits and gained environmental improvements as secondary benefits. Companies mainly perceived ecolabels as market and consumer-oriented tools. Attaining ecolabels was found to act as a stamp of approval of the comprehensive sustainability strategy that a company already has (Iraldo & Barberio, 2017). However, some studies have found that companies' environmental performance is enhanced after ecolabel introduction, especially within industries that the ecolabel was well suited (Thidell, 2009). According to Iraldo et al. (2020), LCA-based approaches can advance the positive market responses of ecolabels.

However, it is not easy to comprehend the possible contributions of ecolabels towards CE and sustainability (Horne, 2009). According to Meis-Harris et al. (2021), good ecolabels that can perhaps contribute towards CE and sustainability include the following six characteristics, trust, visibility, environmental credibility, market penetration, values clarity and policy integration. However, even if the label includes all the characteristics, it is still unclear how well labels can contribute to changing consumer purchasing behaviour and therefore contribute towards CE and sustainability.

6 CONCLUSIONS

The purpose of the current thesis was to examine how Finnish CE forerunner companies perceive ecolabels. In addition, the thesis aimed to determine whether or not the companies use ecolabels in their operations. The analysis revealed that most of the companies who took part in the survey did not have ecolabels in use. Among the respondents, there were many SMEs who can struggle with obtaining ecolabels, which might explain the findings. Among the nine companies with ecolabels in use, the most popular ecolabels were GOTS and Öko-tex labels, perhaps due to most of the respondents being textile industry companies.

Furthermore, the thesis aimed to determine what the surveyed companies perceived to be the most important drivers and barriers for attaining ecolabels. The most significant drivers for ecolabel use were found to be gaining a competitive advantage, encouraging consumers to buy the company's products, increasing the value of the products, and increasing the company's value. The most significant barriers for attaining ecolabels were the costs of ecolabels being too high and the process of obtaining ecolabels being too long. It was also found that the more employees and larger annual revenues the companies had, the more the companies felt pressure from retailers to get ecolabels. Moreover, the more the companies had employees, the more the companies felt that there is not enough evidence of the usefulness of ecolabels in terms of achieving sustainability.

In addition, the thesis investigated how the Finnish CE forerunner companies perceived the relationship between ecolabels and CE. The analysis revealed that the respondents' perceptions about the relationship were divided, which can be, for example, due to using different ecolabels or representing different industries. It was also found that less than half of the respondents used environmental assessment and improvement tools to advance their CE and sustainability-related goals. Furthermore, only one company reported using ecolabels in advancing their circular economy-related goals.

To conclude, the thesis revealed that if Finnish CE forerunner companies get ecolabels, it tends to be due to achieving a competitive advantage or other related economic benefits. However, companies still struggle with ecolabels or do not find them beneficial enough to start the expensive and lengthy obtaining process. Furthermore, most companies with ecolabels have detected challenges using ecolabels, and the majority of companies have had a hard time detecting benefits from ecolabel use. Based on the thesis, it could be determined that there are still significant barriers for ecolabel use present, especially for Finnish CE SMEs.

6.1 Limitations of the thesis

A variety of limitations can be detected within the thesis process that decreases the reliability of the results. First, the FINIX project's list only had companies

from the textile industry, which means that the setting was somewhat skewed towards textile industry companies. Although, the study aimed to select different companies from different industries and not focus on any one industry over others. Secondly, the two company listings used for the thesis did not have a large accumulative total of companies on them. More listings and, therefore, more companies would have meant more answers for the survey, which could have increased the credibility of the results.

Although the response rate was relatively good because the number of companies that the survey was sent in the first place was low, it would have been beneficial to gain an even better response rate. In as many cases as possible, the invitation email was sent to a person in the company who would have the best knowledge of the company's environmental matters. However, especially with the companies on the FINIX-projects list often only have one email address on their webpage, and it was the general email address for the company. This could have affected the response rate as there was no way to ensure that the email had reached the best possible person to answer the survey. The respondent's role was not asked in the survey as the research wanted to protect the privacy of the respondents as much as possible.

Finally, some of the survey questions could have been formatted differently. For example, question 27 about the relationship between ecolabels and circular economy could have been asked from all respondents to understand the relationship better. Moreover, question 21 about the drivers for using ecolabels could have perhaps included a broader range of answer options from an environmental, social, and economic point of view. Furthermore, the results could have been more interesting if drivers and barriers for attaining ecolabels (questions 21 and 23) would have been asked from both ecolabel holders and other companies. In addition, although "I do not know" options were used as little as possible, but the ones that were present had sizeable impacts on the results as the n was low in any case, and those options took away from the relevant answers. Having fewer of the "I do not know" options could have made the survey more challenging to answer, but it could have also benefitted the reliability of the results.

6.2 Future research proposals

The world is in desperate need of taking action in order to enable the transition towards holistic sustainability. As companies can significantly impact the environments, societies, and economies around them, the author thinks it is crucial to assist companies in achieving their circular economy and sustainability-related goals. Despite the results of the thesis, it is evident that the potential of ecolabels in sustainability and CE transition is widely discussed in the literature. The author suggests that a more comprehensive study about companies perceptions on both ecolabels and CE should be conducted in the future as the world will be unable to assist companies in their transition towards CE and sustainability if

their perceptions about the current trends are unclear. It is fundamental to explore further why companies might not use ecolabels and how ecolabels could be easier to attain for all kinds of companies, especially SMEs. Finally, the overall usefulness of ecolabels in terms of improving a company's environmental performance and circular incentives still requires more research.

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APPENDIX 1 The survey questions

Mandatory questions are marked with an asterisk (*)
Sustainability

1. Has your organization committed to any environmental responsibility related actions, what actions? *

Environmental strategy
Environmental policy
Environmental objectives
Enviornmental certification
Environmental management system (ISO14001, EMAS)
Environmental agreement
Environmental commitment
Global Reporting Initiative (GRI) corporate responsibility reporting
Environmental responsibility network
Other environmental responsibility related policies, what?
No

2. If you wish, you can further describe the content of the environmental responsibility related policies in your organization here.
3. Is sustainability an integral part of your company's vision, mission or strategy? *

Yes, it is an integral part of the vision
Yes, it is an integral part of the mission
Yes, it is an integral part of the strategy
It is not an integral part of the vision, mission and strategy

4. How important are the following actions and practices in supporting sustainability for your organization? (Not at all important / not relevant, a little important, somewhat important, important, very important) *

We use ethical sourcing mechanisms (taking into account responsibility, the environment and human well-being)
We make our products durable to ensure longevity
We use water/ energy/ raw materials efficiently
We have reduced the company's environmental footprint
We develop eco-innovation
We reduce our waste production
We reduce our emissions
We aim for carbon neutrality
We have a sustainable value chain
We are transparent about our activities related to sustainability
We collaborate with our stakeholders to achieve sustainability
We have our top management committed to sustainability
We have a safe work environment
We train our employees on sustainability
We advance employees' rights

We aim to reduce inequality in our own community (inequality based on income, age, gender, disability, race, ethnicity, origin or religion)

5. What other sustainability related actions and practices are important for your organization?
6. What concrete sustainability-related challenges does your company see in the future, and how do you aim to solve them?

Circular economy

7. Which circular economy business model best describes the business model of your organization? (You can choose 1-2 answer options) *

Product as a service (Products act as a service used by customers via leasing or pay-for-use agreement with no transfer of ownership.)
Renewability (Using renewable, recyclable, or biodegradable resource inputs in designing and manufacturing.)
Sharing platform (A platform that encourages users to maximize the usage of a product via for example, selling it forward.)
Product-life extension (Extending a life of a product either via using a product as long as possible or allowing the product to be reused with the help of repairing, or refurbishing.)
Resource efficiency and recycling (Coming up with solutions that are both material and energy efficient).
Other circular economy related business model, what?
Our operations are based on a linear business model

8. Is circular economy an integral part of your company's vision, mission or strategy?*

Yes, it is an integral part of the vision
Yes, it is an integral part of the mission
Yes, it is an integral part of the strategy
It is not an integral part of the vision, mission and strategy

9. How important are the following actions and practices in supporting circular economy for your organization? (Not at all important / not relevant, a little important, somewhat important, important, very important) *

We manufacture refurbished or remanufactured products
We recycle everything we can
We use water/ energy/ raw materials efficiently
We use renewable energy
We reduce our waste production
We reduce our emissions
We use recycled raw materials or components in our products
We have a take back scheme
We make our products durable to ensure longevity
We advance the efficiency or sharing of product utilization
We produce renewable energy
We avoid using dangerous chemicals
We advance the "product as a service" concept
Our production has closed circuits
We use by-products from production as raw materials

The by-products of our production are utilized outside our operations
We have a repair service for our products

10. What other circular economy actions related and practices are important for your organization?
11. What concrete circular economy-related challenges does your company see in the future, and how do you aim to solve them?

Sustainability and circular economy

12. Has your organization used environmental assessment and improvement tools to advance sustainability and circular economy goals? *

Yes
No
I do not know

13. If yes, which of the following tools are used? (Used for sustainability goals, used for circular economy goals, tool not in use)*

Material input per service unit analysis
Lifecycle analysis
Product environmental footprint (PEF)
Environmental product declarations (EPD)
Environmental management systems
Environmental impact assessment
ISO standards
Carbon footprint
Water footprint
Ecodesign tools, which ones?
Ecolabels, which ones?
Other calculators or tools, which ones?

Ecolabels

14. Are any of your organization's products or services currently eco-labelled?*

Yes
No

15. If yes, does your organization's products or services have any of the following ecolabels? *

BCI
B Corporation
Biodegradable products institute label
Blue Angel Label
Blue Sign
Bra Miljöval "Good Environmental Choice"
BREEAM
CarbonNeutral
Carbon Trust Footprint label
Cradle to Cradle Certified(CM) Products Program
Energy Star
EKOenergy
EU Ecolabel

EU Energy Label
GOTS
Leadership in Energy and Environmental Design (LEED)
Organic labels (The Finnish Organic Association – The ladybird label, Finnish Organic, EU Organic Products Label, other organic labels)
Programme for the Endorsement of Forest Certification (PEFC)
Rainforest Alliance
Roundtable on Sustainable Biomaterials
SCS Recycled Content Certification
TCO Certified
Forest Stewardship Council (FSC)
The Nordic Swan Ecolabel
Öko-Tex labels
We have developed our own responsibility label
Other sector specific labels, what?
Other labels, what?

16. Is your company aiming to get new ecolabels? *

Yes, what ecolabel?
No
I do not know

17. Does your organization require ecolabels, other certifications, environmental product declarations or environmental management systems from your suppliers? *

Yes
No
I do not know

18. If so, what? *

We require ecolabels
We require environmental certifications
We require environmental product declarations
We require environmental management systems
We require product environmental footprint (PEF)

19. What environmental management systems?

EU Eco-Management and Audit Scheme (EMAS)
EcoCompass
ISO 14001
WWF Green office
Something else, what?

20. Which ecolabels are you requiring from your suppliers? *

BCI
B Corporation
Biodegradable products institute label
Blue Angel Label
Blue Sign
Bra Miljöval "Good Environmental Choice"
CarbonNeutral

Carbon Trust Footprint label
Cradle to Cradle Certified (CM) Products Program
Energy Star
EKOenergy
EU Ecolabel
EU Energy Label
GOTS
Organic labels (The Finnish Organic Association – The ladybird label, Finnish Organic, EU Organic Products Label, other organic labels)
Programme for the Endorsement of Forest Certification (PEFC)
Rainforest Alliance
Roundtable on Sustainable Biomaterials
SCS Recycled Content Certification
TCO Certified
Forest Stewardship Council (FSC)
The Nordic Swan Ecolabel
Öko-Tex labels
Other sector specific labels, what?
We have developed our own responsibility label
Our suppliers have their own company-specific labels
Other labels, what?

21. If your organization has ecolabels, how important were the following drivers for their introduction? (Not at all important / not relevant, a little important, somewhat important, important, very important) *

Encourage consumers to buy our products
Access to new markets
Gaining competitive advantage
Increase in the value of products
Increase in the value of the company
Pressure from consumers
Pressure from legislation
Pressure from public purchasers
Pressure from retailers

22. What other drivers does/did your organization have for introducing eco-labels into its operations?
23. If your organization does not have ecolabels, how important were the following factors for deciding not to introduce ecolabels into your operations? *

Lack of recognition from the public sector
Excessive documentation
There is no market demand for ecolabels
Not enough competitive advantage
Cost of obtaining ecolabels is too high
The process of obtaining ecolabels is too long
Not suitable for our organization's product
Find ecolabels to be confusing for consumers

Find ecolabels to be confusing for organiations
There is not enough evidence of the usefulness of ecolabels in attracting customers
There is not enough evidence of the usefulness of ecolabels in sustainability

24. What other reasons did your organization have for not introducing ecolabels into its operations?
25. Has your organization detected any challenges in using ecolabels? *

Yes
No

26. Has your organization detected any benefits in using ecolabels *

Yes
No

Ecolabels and circular economy

27. From an organizational perspective which answer best describes the relationship between ecolabels and circular economy goals? *

Ecolabels are beneficial in the organization's efforts towards circular economy goals
Ecolabels are hampering or slow down the organization's efforts towards circular economy goals
Ecolabels have no effect/ are not connected to the organization's efforts towards circular economy goals
Something else, what?
I do not know

28. How have the ecolabels you use contributed to achieving your circular economy goals? *
29. How have the ecolabels you use hampered achieving your circular economy goals? *
30. Name (and select) at least one and at most three ecolabels that affect your circular economy-related goals*
31. Answer the following statements from the perspective of the ecolabels you mentioned above (Not relevant, does not advance at all, advances a little, somewhat advances, advances a lot): *

Use of bio-based, biodegradable, non-toxic or natural materials
Use of recycled materials
Service life extension (eg maintenance, repair, refurbishment, take-back)
Waste prevention or recycling
Innovative business models based on distribution, remanufacturing or service operations
Something else, what?

32. Answer the following statements from the perspective of the ecolabels you mentioned above (Not relevant, does not advance at all, advances a little, somewhat advances, advances a lot):

Use of bio-based, biodegradable, non-toxic or natural materials
Use of recycled materials
Service life extension (eg maintenance, repair, refurbishment, take-back)
Waste prevention or recycling

Innovative business models based on distribution, remanufacturing or service operations
Something else, what?

33. Answer the following statements from the perspective of the ecolabels you mentioned above (Not relevant, does not advance at all, advances a little, somewhat advances, advances a lot):

Use of bio-based, biodegradable, non-toxic or natural materials
Use of recycled materials
Service life extension (eg maintenance, repair, refurbishment, take-back)
Waste prevention or recycling
Innovative business models based on distribution, remanufacturing or service operations
Something else, what?

34. If you wish, you can describe in more detail the circular economy-related goals that ecolabels advance

Background information

35. How many employees does your company have? *

More than 250 employees
50-250 employees
10-49 employees
Less than 10 employees
No employees

36. Which option best describes the annual revenue of your organization (€)?*

More than 100 million
10-100 million
1-9 million
250 000-999 000
100 000-249 000
Less than 100 000

37. Which option best describes the product of your organization? *

Intangible service
Physical product
Both an intangible service and a physical product

38. Which option best describes the industry that your organization operates in? *

Professional, scientific and technical activities
Administrative and support service activities
Information and communication
Mining and quarrying
Real estate activities
Activities of households as employers; undifferentiated goods- and services- producing activities of household for own use
Education
Transportation and storage
Activities of extraterritorial organisations and bodies
Agriculture, forestry and fishing

Accommodation and food service activities
Financial and insurance activities
Construction
Arts, entertainment and recreation
Manufacturing
Human health and social work activities
Wholesale and retail trade; repair of motor vehicles and motorcycles
Water supply; sewerage, waste management and remediation activities
Electricity, gas, steam and air conditioning supply
Public administration and defence; compulsory social security
Other service activities, what?
Other/ industry unknown, what?

39. What area of manufacturing? *

Manufacture of food products
Manufacture of beverages
Manufacture of tobacco products
Manufacture of textiles
Manufacture of wearing apparel
Manufacture of leather and related products
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
Manufacture of paper and paper products
Printing and reproduction of recorded media
Manufacture of coke and refined petroleum products
Manufacture of chemicals and chemical products
Manufacture of basic pharmaceutical products and pharmaceutical preparations
Manufacture of rubber and plastic products
Manufacture of other non-metallic mineral products
Manufacture of basic metals
Manufacture of fabricated metal products, except machinery and equipment
Manufacture of computer, electronic and optical products
Manufacture of electrical equipment
Manufacture of machinery and equipment n.e.c.
Manufacture of motor vehicles, trailers and semi-trailers
Manufacture of other transport equipment
Manufacture of furniture
Other manufacturing
Repair and installation of machinery and equipment

40. Final comments about the topic or the survey