



# Master's degree thesis

LOG904-100

**Circular Economy in the Service Sector:  
How Circular Economy Principles Can Transform the  
Service Value Chain**

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## **Preface**

We would like to give a huge thanks to our research supervisor, Nina Pereira Kvalsheim, for being patient and for her excellent guidance and support from the beginning of this work. Her passion and expertise in circular economy have given us motivation and zeal to investigate into this topic. Also, her excellent advice and critical feedback have been crucial through this journey, therefore this study would not have been possible without her.

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Molde 25.05.2021

Anne Cathrine Skinmo

Helene Hassel Fjærli

## **Abstract**

**Purpose** – The purpose of this study is to contribute to the literature on how circular economy principles can affect the service value chain. The study aims to look at how different CE strategies are utilized and how they can affect the value chain of a company in the service industry. Further, the study investigates which challenges the CE principles can bring into the SC and suggestions of how to overcome them.

**Design/methodology/approach** - In order to investigate how CE principles can affect the service value chain, an exploratory multiple case study was conducted of a Norwegian transport service provider and four of their customers. This study is a qualitative study where data were collected through semi-structured interviews, aiming at acquiring insight and information into this topic.

**Findings** – The empirical findings show that the CE principles are utilized differently by the transport service provider and their customers. The reuse and reduce strategies are commonly used strategies, while recycling is less utilized by the companies. Additionally, these strategies bring varying challenges to overcome for the transport service provider. The challenges include economic, network, uncertainty and environmental issues. Still, several measures are discovered to overcome these challenges, where cooperation is a dominant strategy.

**Limitations of the study** – There are mainly a few identified limitations of this study, which may impact the findings. First, the number of customers is limited. Second, the data is only obtained through semi-structured interviews. Finally, the study is limited to the Norwegian market.

**Practical implication** - In a world where consumption is increasing, the ability to reduce waste and keep the materials in use for a longer time period is crucial. The understanding of how companies can use CE principles to gain value is the key to move from a linear to a circular economy.

**Key words** – Circular Economy, Sustainability, Supply Chain Management, Value Chain, Service Industry, Transport Service Provider

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# **1.0 Introduction**

## **1.1 Chapter Introduction**

This chapter introduces the topic for this study. The chapter starts by introducing the background of the study, followed by the research problem, which is derived from the gaps and missing links in the literature. Further, the research questions (RQs) are explained and justified, and this establishes the fundament for the rest of the study. Finally, an overview of the structure of the thesis is provided.

## **1.2 Background and Purpose of the Study**

As the world's consumption increases, the carrying capacity of the planet and its resources go down and the sustainability suffers (Circle Economy 2020a). In 2019, the world population consumed yearly resources as if there were 1.75 planets (Earth Overshoot Day 2019), and with this trend by 2050 the consumption will be as if there are 3 planets (UN 2020). According to the European Commission (2020), about half of the greenhouse gas (GHG) emissions and more than 90 percent of the loss of biodiversity and water stress stems from resource extraction and processing. Therefore, there is an urgent need for the world to transition to more sustainable sociotechnical systems and reevaluate how the population should consume the planet's resources (Geissdoerfer et al. 2017).

To address the sustainability issues there is a need to understand the natural environment and change how we conduct business (Christopher and Holweg 2011). Currently, the world's economy practices a linear model where take-make-use-dispose is the preferred pattern of consumption. Companies extract resources and materials from nature, manufacture them into products and sell them to consumers, who then discards the products when they no longer serve their purposes. By considering the damaging consequences of resource extraction, research and innovation have found ways to improve the resource efficiency and explore alternative forms of energy. Still, a system such as the linear model which is based on consumption instead of restorative use of resources will entail loss of value and negative effects in the material chain. Additionally, several companies have noticed that the linear system increases their exposure to risk, especially through sudden

increases in resource prices and supply disruptions. Therefore, a new model of consumption is needed (Ellen MacArthur Foundation 2015).

The concept of Circular Economy (CE) has recently gained increased attention among scholars, practitioners and policy makers as an alternative to the traditional linear model (Geissdoerfer et al. 2017). The CE is a restorative industrial system, as the “end-of-life” concept is replaced with restoration and materials are looped back into the economic system at the end of their lifetime. It aims at using renewable sources of energy, eliminate toxic materials, and remove the concept of waste (Ellen MacArthur Foundation 2012). The switch from a linear model of economy to a circular one will both reduce negative impact on the natural environment and save companies hundreds of billions of US dollars (Yang et al. 2018). According to the Ellen MacArthur Foundation (2015) a transition into the CE will benefit economies from large material savings, reduction in supply risk and volatility, potential job creation and employment benefits, a reduction in externalities, and long-term resilience in the world economy. The European Commission (2020) argues that the CE also will offer benefits to citizens through providing functional, high-quality and safe products at an affordable price that last longer and are designed for repair, reuse and recycling. This shift will create a new range of services, product-as-service models and digital solutions which improve the quality of life and generate innovative jobs.

Still, a report by Circle Economy (2020b) reveals that the world economy in 2020 was 8,6 percent circular. This implies that 91,4 percent of the world economy still follows a linear pattern of consumption where materials are not looped back into the economic system. Therefore, to reduce the negative environmental impact there is an urgent need to increase the economy’s circularity (Ellen MacArthur Foundation 2015). This must be done through a drive of change in several industries, such as in the service industry. However, there is a lack of research on CE in the service industry (Heyes et al. 2018) and this is further elaborated in the next section.

### 1.3 Research Problem

Previous studies in CE have a large focus on the product value chain. Today, the existing CE frameworks mainly aim at developing circular solutions for products and their production processes (Mendoza et al. 2017, Rashid et al. 2013). However, to make the world economy circular it is not enough to only improve the circularity of physical products. As the CE aims to solve all environmental and resource issues, change needs to happen in various industries. For instance, transport service providers need to act as a nexus through ensuring an efficient and environmentally friendly flow of circular materials and solutions (Deloitte 2020). Therefore, a challenge for the CE is the lack of research in the service sector (Day and Jung 2000, Hayes 2020, Matthyssens and Vandenbempt 2008). In the shift towards a CE, the service sector has the potential to play an essential role because of its strategic position between end-users and manufacturers. This allows companies in the service sector to influence the way customers use the products they purchase. For instance, customers might accept product lease, per-use fees, and participate in take-back programs (Heyes et al. 2018).

Besides, there is a lack of research related to methodologies and real-life applications for how the CE principles can be implemented into service companies' business (Day and Jung 2000, Heyes et al. 2018, Matthyssens and Vandenbempt 2008, Yihsing Yang et al. 2013). The existing literature remains silent on how CE principles can affect the service value chain, which creates a barrier to the implementation of CE among service providers. Additionally, service as a term has no globally agreed upon definition. As the service industry includes different divisions, such as transportation, communication, finance, insurance, and administration, it is hard for researchers to come up with a definition that cover all these areas. Limiting the scope of a research becomes more difficult when there is no definition of the given topic, and therefore it requires more effort to conduct research within this area (Ellram, Tate, and Billington 2004, Ng, Maull, and Yip 2009). At the same time, the service industry is constantly growing and largely affecting the world economy (Leksono, Suparno, and Vanany 2017). By this reason, several manufacturers are interested and have the willingness to become a service provider (Yihsing Yang et al. 2013). As gaining economic value and maintaining their competitive position in the market is key for all businesses, evidence and an established framework for how actors in the service industry successfully can transition into the CE must be proven. Establishing the service industry perspective is

crucial in order to drive the world's economy away from the linear model of consumption. Therefore, this thesis aims to address this gap by analyzing how the implemented CE principles can transform the service value chain. Based hereon, the following research problem is defined:

*There is lack of knowledge on how CE principles can transform the service value chain.*

To address this, the study takes a holistic approach to the existing literature in order to gain an understanding of how the implementation of CE may affect the value chain of the transport service providers. With the holistic approach, insights into which CE principles the customers of the transport service providers are practicing and are planning to adopt in the future are also acquired. This facilitates the study to discover the connection between such service providers and their customers, and how this may affect transport service providers' entire value chain. In this regard, the study aims at answering four RQs as described in the next section.

## **1.4 Research Questions**

In order to address the research problem and explore how CE principles can transform the service value chain, the following RQs are proposed:

**RQ1: What CE strategies have the transport service providers and their customers already adopted and how are they utilizing them?**

From the extant literature, it is clear that the most established and often referred to CE strategies are the 3Rs: reduce, reuse and recycle (Ellen MacArthur Foundation 2015, Kirchherr, Reike, and Hekkert 2017). These Rs represent key strategies to achieve a CE. According to literature, different authors claim that various numbers of Rs should be included. Some argue that there are three, some six, and others nine (Jawahir and Bradley 2016, Potting et al. 2017). Still, according to Kirchherr, Reike, and Hekkert (2017), 3Rs are the preferred choice among authors as most of the other Rs broadly can be categorized within the three. Therefore, this study will refer to these 3Rs when mentioning CE strategies. Furthermore, the transport service providers' customers are in this study defined as

companies that procure a distribution service from them to support their own business. In short, this RQ seeks to identify the CE strategies that the transport service providers and their customers are practicing and how they are doing it. This will provide insights into the supply chain (SC) of each customer and the transport service provider, detecting where and how they are utilizing their CE strategies.

**RQ2: How are these adopted CE strategies affecting the transport service providers' value chains?**

Every company has their own business model (BM) which describes how they conduct business (Teece 2010). In other words, the BM illustrates how they create, deliver and capture value for all stakeholders in the SC network. As all participants in the SC are connected, all operations throughout the chain will be affected by innovations and changes in each company's BMs. Therefore, all adopted strategies by customers need to be designed into the transport service providers' BM to fit all sources of value creation (Yang et al. 2018). Previous research has typically investigated how and why companies can become more circular by adopting CE strategies, such as by DHL (2016). This study, however, explores this issue from the customers' point of view. Put differently, this RQ aims at investigating how the circularity of the transport service providers' customers affects the service providers' value chain.

**RQ3: What are the challenges the transport service providers may face with a shift from a linear to a circular supply chain among their customers?**

In this changing globalized world, customers' requirements are increasing. Most companies are experiencing stricter requirements from their stakeholders on the economic, social and environmental level (Savitz and Weber 2014). To maintain a competitive position in the market, it is crucial that companies are adapting to these demands and are continuously developing their BM according to the market. Nevertheless, this might bring some challenges. As the different customers usually practice different strategies, adapting to all customer requirements leads to a complex SC (Abbasi 2012, Morana 2013). For instance, a rental strategy will require a responsive SC with a well-established reverse logistic system, while the reuse strategy mainly relies on large volumes and a traditional SC flow (Bonev 2012, Eftestøl-Wilhelmsson, Sankari, and Bask 2019). The main purpose of this RQ is to

explore the challenges that the transport service providers may face from adapting to their customers' changing requirements. The challenges of transitioning from a linear to a CE described in this study is derived from theory due to the lack of evidence within the service industry. The goal for this study is to contribute to documentation within this field.

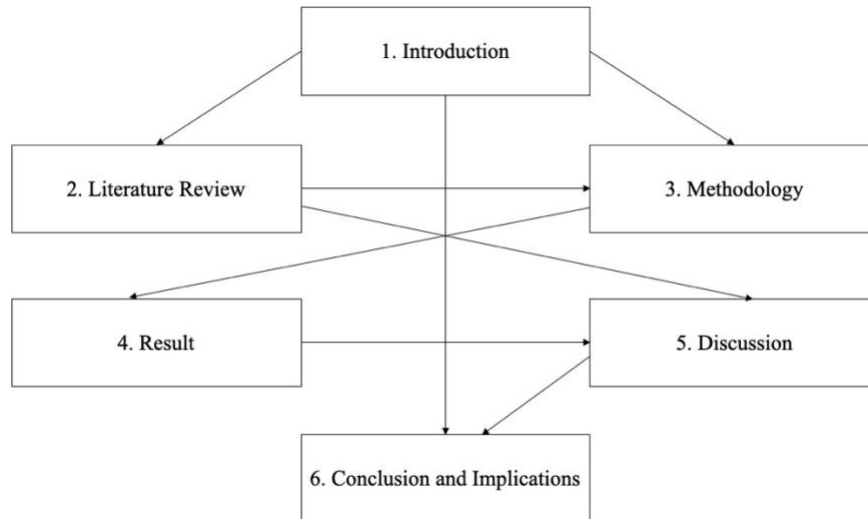
#### **RQ4: How can the transport service providers overcome such challenges?**

This RQ seeks to examine how the transport service providers' value chain can be affected in the future by the adoption of CE strategies among their customers. In a service value chain, the customers are highly involved in all SC processes and therefore it is key to satisfy their requirements (Hussain, Khan, and Al-Aomar 2016). Hence, the main purpose is to detect how the transport service providers should overcome the challenges they are facing to satisfy their customers' requirements. Next, the structure of the thesis is presented.

### **1.5 Thesis Structure**

This study is organized into six chapters, as illustrated in Figure 1-1. Chapter one is the introduction and covers the background and purpose, the research problem, the research questions and the structure of the study. Chapter two presents already existing, relevant literature through a literature review and is divided into three different sections: an overview of CE, CE in SCs, and CE in the service industry. The research methodology employed in this study is explained in chapter three, while chapter four presents the findings and results from the data collection. In chapter five, the findings in chapter four are discussed in the light of the literature review. Chapter six presents the conclusion of the study and consists of a research summary, the implications, the limitations of the study and suggestions for further research.





*Figure 1-1 Thesis Structure*

## **1.6 Chapter Summary**

This chapter provided the background of the study, as well as the research gaps and missing links. Also, the research purpose and research questions were presented. The research questions lay the foundation for the rest of the chapters presented in this thesis. Next, the literature review is introduced, where relevant literature on CE in general, CE in the SC and CE in the service industry will be outlined.

## **2.0 Literature review**

### **2.1 Chapter Introduction**

According to O’Gorman and MacIntosh (2015), the purpose of a literature review is to provide a background and justification for the research conducted in the study. The writer should extract and synthesize the main points and findings through a critical review of the existing literature. This chapter is divided into three main parts: 1) an overview of CE, whose aim is to establish a general knowledge on the topic, and to answer the RQs of which CE strategies the transport service providers and their customers are using; 2) CE in SCs, seeks to understand how the CE strategies are affecting the SCs, and 3) CE in the service industry, as the topic of this thesis is a case company operating in the service industry. Additionally, this chapter reviews literature to understand what the challenges of transitioning from a linear to a circular SC are.

### **2.2 Circular Economy - An Overview**

For a long time, the world’s economy has been linear. A linear economy means that the world follows the traditional industrial model of take-make-use-dispose, where raw materials are extracted, transformed into physical products, being used by consumers, and at the end the product is thrown away as non-recyclable waste. In a CE, however, the value of products, materials and resources are maintained for as long as possible in a closed loop economy. Thus, when the products reach the end of their life they are cycled, or looped back into the economic system. A CE can be described as an industrial system that is designed to be regenerative by intention (Ellen MacArthur Foundation 2015). This implies that the end-of-life concept is replaced with restoration, and the use of renewable energy sources, elimination of toxic materials, and reuse and return to the biosphere is emphasized. To become fully circular, systems need to be created where waste is entirely designed out of the system and there is no need for extracting new resources (Ellen MacArthur Foundation 2014). The subsequent sections cover different aspects of CE, such as its origin, the definition, its components, and its criticisms and barriers.

### **2.2.1 Origin of Circular Economy**

The characteristics of the CE can be traced back to longer than the current use and understanding of the concept. Some authors claim that the CE concept can be traced all the way back to 1758 when the French economist François Quesnay published “Tableau Economique” where assumptions on surplus value from cyclical inputs were presented (Murray, Skene, and Haynes 2015). Certain authors also argue that it was Pearce and Turner (1990) that presented the very first framework that described the concept of a CE (Ghisellini, Cialani, and Ulgiati 2016, Su et al. 2013, Winans, Kendall, and Deng 2017). In “Economics of Natural Resources and the Environment”, Pearce and Turner discussed how the traditional economy has no built-in facilitation for recycling, which results in the nature being treated as a landfill. Therefore, they argued that by considering the environmental issues and the resource scarcity it is beneficial to operate with a closed economic system with circular relationships (Su et al. 2013). Some researchers argue that Pearce and Turner’s presentation of the CE is inspired by previous research of the ecological economist Boulding (1966). He illustrated planet earth as a spaceship with limited resources, and his discussion of open and closed systems had a focus on the interaction between the environment and the economy (Ghisellini, Cialani, and Ulgiati 2016, Lieder and Rashid 2016).

Other researchers also argue that the concept of CE cannot be traced back to a single author or date, but rather several authors in the form of leaders, businesses and academics. The different concepts have been developed and refined over time by many scholars, which have created the concept of CE that is known today. Many authors have presented the different works they consider as the most influential on the CE concept (Ellen MacArthur Foundation 2013, Geissdoerfer et al. 2017, Winans, Kendall, and Deng 2017). The works that are frequently credited by several authors are briefly described in Table 2-1. Further, some of the definitions that are known of CE today will be discussed in the next section.

Table 2-1 Influencing Concepts on the CE

Name	Description	Principles	References
<b>Regenerative design – John T. Lyle 1996</b>	Lyle (1996, 10) defined regenerative design as a replacement of the already existing linear systems of throughput flows with “ <i>cyclical flows at sources, consumption centers, and sinks</i> ”.	<ol style="list-style-type: none"> <li>1. Safe and healthy materials.</li> <li>2. Materials reuse.</li> <li>3. Renewable energy and carbon management.</li> <li>4. Water stewardship.</li> <li>5. Social fairness.</li> </ol>	(Ellen MacArthur Foundation 2013) (Lyle 1996) (Mang and Reed 2012)
<b>Performance Economy - Walter Stahel and Genevieve Reday 1976</b>	When explaining what Performance Economy is, Circular Academy (2020) states “ <i>in a performance economy, object of the sale is not the product itself but rather the performance it provides, and the benefits offered to the user</i> ”.	<ol style="list-style-type: none"> <li>1. Sufficiency over efficiency.</li> <li>2. Selling performance instead of products.</li> </ol>	(Circular Academy 2020) (Ellen MacArthur Foundation 2013) (Product Life Institute 2017) (Stahel 2011)
<b>Cradle-to-Cradle - Michael Braungart and Bill McDonough 1990</b>	Cradle-to-Cradle can be defined as “ <i>the design and production of products of all types in such a way that at the end of their life, they can be truly recycled (upcycled), imitating nature’s cycle with everything either recycled or returned to the earth, directly or indirectly through food, as a completely safe, nontoxic, and biodegradable nutrient</i> ” (Idowu et al. 2013).	<ol style="list-style-type: none"> <li>1. Everything is a resource for something else.</li> <li>2. Use clean and renewable energy.</li> <li>3. Celebrate diversity.</li> </ol>	(Contreras-Lisperguer et al. 2017) (Cradle to Cradle Products Innovation Institute 2020) (Ellen MacArthur Foundation 2013)
<b>Industrial Ecology - Robert A. Frosch and Nicholas E. Gallopoulos 1989</b>	“ <i>Industrial ecology is the study of material and energy flows through industrial systems. Focusing on connections between operator within the ‘industrial ecosystem’, this approach aims at creating closed-loop processes in which waste serves as an input, eliminating the notion of an undesirable by-product</i> ” (Ellen MacArthur Foundation 2013).	<ol style="list-style-type: none"> <li>1. Waste and by-products must systematically be valorized.</li> <li>2. Loss caused by dispersion must be minimized.</li> <li>3. The economy must be dematerialized.</li> <li>4. Energy must rely less on fossil hydrocarbon.</li> </ol>	(Baldassarre et al. 2019) (Ellen MacArthur Foundation 2013) (Frosch and Gallopoulos 1989) (den Hond 2001) (Erkman 2001)
<b>Biomimicry - Janine Benyus 1997</b>	Biomimicry is defined as “ <i>a new discipline that studies nature’s best ideas and then imitates these designs and processes to solve human problems</i> ” (Ellen MacArthur Foundation 2013, 31).	<ol style="list-style-type: none"> <li>1. Nature as a model.</li> <li>2. Nature as a measure.</li> <li>3. Nature as a mentor.</li> </ol>	(Ellen MacArthur Foundation 2013) (Hargroves and Smith 2006)

## 2.2.2 Definition of Circular Economy

Even though the CE has its origins in different theories and frameworks and is a concept of large interest among both practitioners and scholars, there is still no globally agreed upon definition of the concept. This explains why there are several definitions in the literature.

For example, Kirchherr, Reike, and Hekkert (2017) analyzed 114 definitions of CE where the definitions were collected from both peer-reviewed journals and papers written by non-academic players. They examined 148 articles, papers and reports, where they found that the most used definition is by the Ellen MacArthur Foundation (2012, 7):

*[CE is] an industrial system that is restorative or regenerative by intention and design. It replaces the 'end-of-life' concept with restoration, shifts towards the use of renewable energy, eliminates the use of toxic chemicals, which impair reuse, and aims for the elimination of waste through the superior design of materials, products, systems, and within this, business models.*

According to Kirchherr, Reike, and Hekkert (2017), the definition by the Ellen MacArthur Foundation (2012) may have influenced later authors' definitions of the CE. This is because an increase in definitions referring to BMs in the CE occurred after 2012 when the report was published. Kirchherr, Reike, and Hekkert (2017) also found that certain activities are frequently mentioned, such as repair, reuse, remanufacturing, refurbishing and recycling. For instance, Geissdoerfer et al. (2017, 759) include these in their definition:

*[CE is] a regenerative system in which resource input and waste emission, and energy leakage are minimised by slowing, closing, and narrowing material and energy loops. This can be achieved through long-lasting design, maintenance, repair, reuse, remanufacturing, refurbishing, and recycling.*

Still, according to Kirchherr, Reike, and Hekkert (2017) the CE is most often depicted as a combination of reduce, reuse, and recycle. Furthermore, a core characteristic of the CE is that all participants are part of a complex system, where everything is linked together (Ellen MacArthur Foundation 2015). Therefore, this study will use a definition of CE that includes these characteristics, by Jiao and Boons (2014, 21):

*...[CE is] a holistic concept covering the activities of 'reduce, reuse, and recycle' in the process of production, circulation, and consumption.*

The different characteristics found in this definition are further explained in the next section.

### **2.2.3 Components of the Circular Economy**

Following Ellen MacArthur Foundation (2015), there are still certain characteristics that are considered as core components of the CE concept. These include certain fundamental characteristics and the R-framework which further is explained in the subsequent sections (Ellen MacArthur Foundation 2013, 2015, Ghisellini, Cialani, and Ulgiati 2016).

#### **2.2.3.1 Fundamental Characteristics**

According to the Ellen MacArthur Foundation (2015), there are five fundamental characteristics of the CE. The first characteristic is that *waste is designed out*. Traditionally, waste management has been considered as a simple way to get rid of materials by landfilling or incinerating. This is still the dominant waste management strategy worldwide, which results in negative environmental impacts. CE, however, recognizes waste management as a process where resources are recovered, and the negative environmental impact is prevented. In a CE, waste does not exist, because materials are designed to fit into either the biological or technical cycle (Ellen MacArthur Foundation 2015, Ghisellini, Cialani, and Ulgiati 2016). The idea of biological and technical cycles is adopted from the Cradle-to-Cradle concept and may be referred to as products for consumption and products for service. The products for consumption, which is in the biological cycle, are consumed throughout their life cycle through degradation or abrasion and will eventually return to the natural system. Therefore, these products should be designed to safely be returned to the natural environment and cause no negative impact. The products for service, which is in the technical cycle, are materials of human artifice. Returning these materials to the natural environment may cause harm, and therefore they should instead circulate within a closed-loop system through maintenance, reuse, remanufacturing and recycling (Braungart and McDonough 2002). A popularized model of these cycles has been created by the Ellen MacArthur Foundation (2012, 24), as shown in Figure 2-1. This model illustrates how the biological and technical materials cycle through the economy as a regenerative system, as well as how waste is designed out of the process.

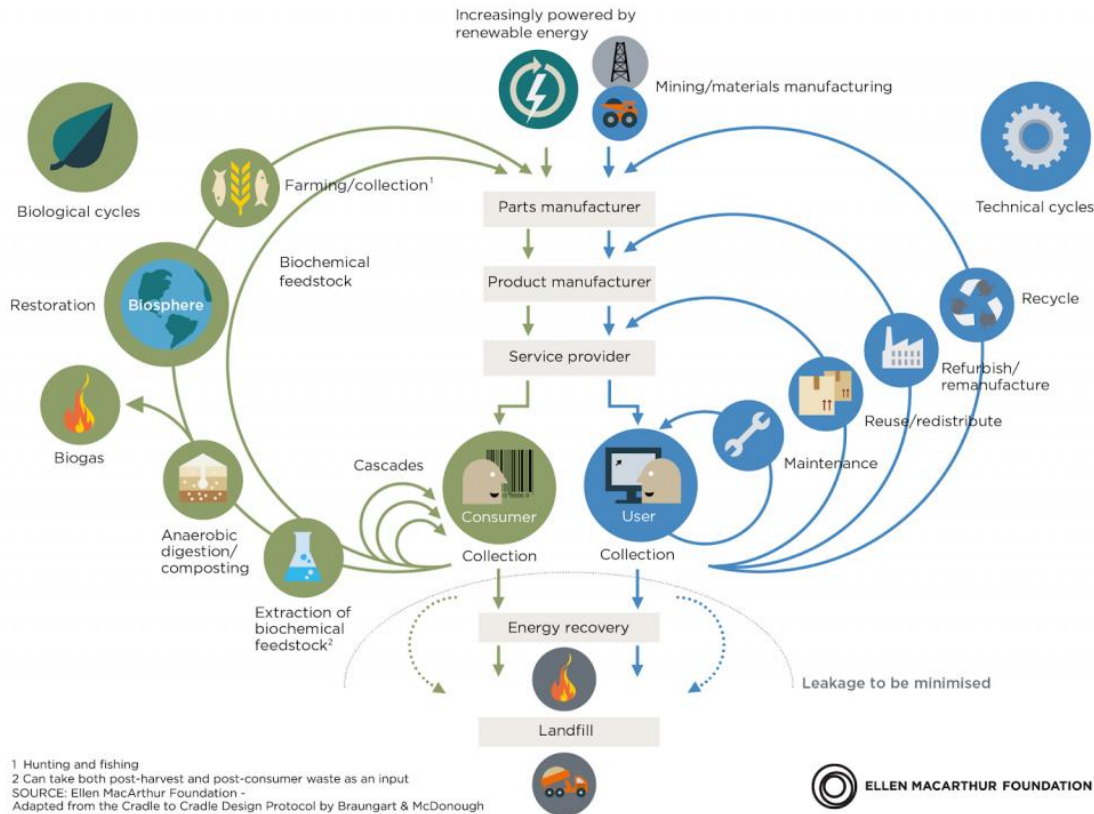


Figure 2-1 CE, a Restorative Industrial System

The second characteristic is that *resilience is built through diversity*. In a living system biodiversity is key to surviving the environmental changes. Similarly, in an economic system a balance of different businesses of various sizes are necessary to thrive in the long term. The large companies provide large volumes and efficiency, while the smaller firms offer new and alternative solutions when crises occur (Ellen MacArthur Foundation 2015, Ulanowicz et al. 2009). The third principle is that *renewable sources need to be used to create energy*. By using renewable energy as the main source of energy in the CE, the dependency on fossil fuels is decreased. This will increase the economic system's resilience toward oil negative effects, such as an increase in oil prices and a lack of supply. Another important impact of shifting towards renewable energy sources is the decrease in the negative environmental impact (Ellen MacArthur Foundation 2015, Ghisellini, Cialani, and Ulgiati 2016).

The fourth characteristic is that *CE needs to be thought of in systems*. The businesses in the CE are part of complex systems where everything is linked closely together. Therefore, when designing the CE these links and their potential consequences need to be taken into

consideration. The production and consumption systems should be designed to simplify resource exchange among the different components, which encourage full resource utilization (Ghisellini, Cialani, and Ulgiati 2016). The fifth and last characteristic is that *the price mechanisms need to reflect the real costs*. In the CE the prices of products and resources should act as messages, and therefore reflect the full costs. This requires full transparency, so that the entire costs of negative externalities are revealed (Ellen MacArthur Foundation 2015). Considering components of CE, the R-framework is the fundamental one and this is explained in the ensuing section.

### **2.2.3.2 The R-Framework**

A core component of CE is the R-framework, which appears in research in many different forms. Commonly, it is referred to as the 3Rs: Reduce, Reuse, and Recycle (Ghisellini, Cialani, and Ulgiati 2016, Sakai et al. 2011, Su et al. 2013). *Reduce* refers to improving the efficiency of production by minimizing the use of resources, such as energy, raw materials and waste. This may be accomplished by introducing simpler packaging and products, newer and better technology, more efficient appliances, a simpler lifestyle, and so on. The way companies are using the reduce principle in practice is by aiming at achieving the concept of eco-efficiency (Ghisellini, Cialani, and Ulgiati 2016, Su et al. 2013). According to Ehrenfeld (2005), eco-efficiency is a business concept that combines performance with development, environment and economics. WBCSD (2000, 4) defines it as:

*Being achieved by the delivery of competitively priced goods and services that satisfy human needs and bring quality of life, while progressively reducing ecological impacts and resource intensity throughout the life cycle, to a level at least in line with the Earth's estimated carrying capacity.*

Figge, Young, and Barkemeyer (2014) describe how companies can increase the eco-efficiency in their production process, by either increasing or keeping the value of the products and at the same time reducing the environmental impact. This is achieved by using fewer resources and less harmful materials per unit of value produced.

According to the EU (2008, 10), the second R, *Reuse*, means “*any operation which products or components that are not waste are used again for the same purpose for which they were*



*conceived*'. Reusing products is very beneficial from an environmental point of view as it requires less resources, energy and labor compared to production processes that calls for extraction of new resources and materials (Ghisellini, Cialani, and Ulgiati 2016). In a study by Castellani, Sala, and Mirabella (2015), they showed that reusing items such as clothes, furniture and books reduce emissions of noxious substances. Some companies apply the reuse principle through offering repair services, which allows them to resell used products. Others may use rental models where they rent products to their customers for a given period, allowing them to maintain the ownership of the products and ensure that the materials are sustainably repurposed at the end of their lifetime (Besch 2005). However, according to Prendeville and Sherry (2014) there are several challenges to implementing the reuse principle. First, the market demand for reused products is poor due to the consumers' perception of these products and their quality. Second, a larger number of manufacturers need to be willing to design durable products and participate in take-back schemes to ensure that the products will be used in multiple cycles. Still, it is argued that it is possible to overcome these challenges by incentivizing companies to favor take-back schemes, and through marketing used products to consumers.

The last R, *Recycle*, encourages the processing of products into new materials at the end of their lifetime in order to reduce the need of virgin materials in the production processes (Su et al. 2013). EU (2008, 10) defines recycling as:

*Any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations.*

Recycling can be divided into two categories, downcycling and upcycling. Downcycling is when products are converted into new materials which are of poorer quality and with reduced functionality. This usually happens by mixing or adding different materials and chemicals together in the process. Downcycling is the most common use of recycling today, which contributes to maintain the linear character of most material flow systems (Ellen MacArthur Foundation 2012). Upcycling, however, is the process of utilizing materials at the end of their lifetime to create new materials of even higher quality or value than the

compositional elements. This practice is embedded in the CE but may be difficult to implement in all material recycling (Sung, Cooper, and Kettley 2019). According to Prendeville and Sherry (2014), it is for instance difficult to upcycle some types of plastics and metals.

Even though the 3Rs are described as the main actions in CE (Ghisellini, Cialani, and Ulgiati 2016), they may be extended to include a fourth R named *Recover* (Kirchherr, Reike, and Hekkert 2017). Jawahir and Bradley (2016) refer to recover as the process of gathering products at the end of their lifetime, and further disassembling, sorting and cleaning them for future use. Even so, the R-framework may be extended to include six Rs, or even nine (Kirchherr, Reike, and Hekkert 2017). According to Potting et al. (2017) nine different Rs can be included in the framework, where they all play a role in reducing the consumption of resources and materials, as well as the minimization of waste. These 9Rs are listed in Figure 2-2 (Kirchherr, Reike, and Hekkert 2017, 224).

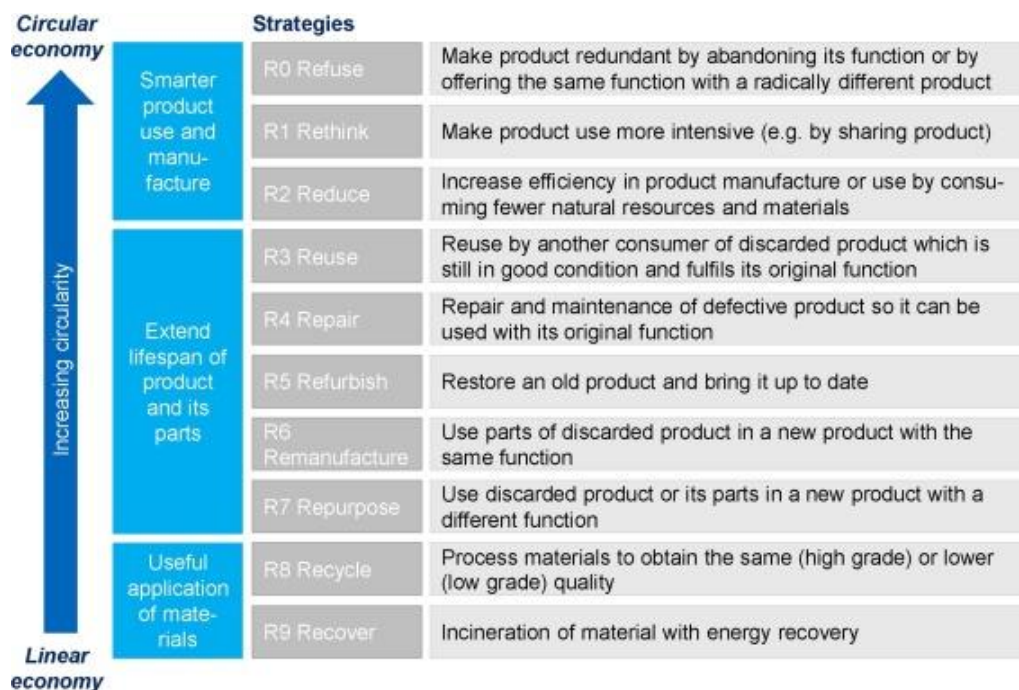


Figure 2-2 The 9R Framework

A feature of the R-framework is the hierarchy of priorities of the different R's that are included. In the hierarchy the first R is viewed as a priority to the second R, and so on (Kirchherr, Reike, and Hekkert 2017). In other words, the different Rs are ranged in a descending priority, as shown in Figure 2-2, where the first R is the most efficient to achieve

the CE objectives. Therefore, refuse, rethink, and reduce are considered the most important Rs, while recover and recycle the least. Figure 2-2 also shows that when only considering the 3R-framework, reduce is acknowledged as the highest prioritized R, while recycle the least (Potting et al. 2017). According to Kirchherr, Reike, and Hekkert (2017), most of the 9Rs are possible to categorize within the broader 3R-framework. The first R in the 3R-framework, *Reduce*, may contain refuse, rethink and redesign. *Reuse* can include repair and refurbishing, while the last R, *Recycle*, may deal with remanufacturing as an upcycling strategy (Steinhilper 1998). Furthermore, the R-framework is closely related to looping models, which is explained in the next section.

#### **2.2.4 Criticisms and Barriers of the Circular Economy**

Even though CE has gained an increasing prominence among authors, Gregson et al. (2015) argue that it is often celebrated and considered as an ideal idea for a sustainable future but is rarely critically examined. However, some authors have described certain barriers and weaknesses of the concept. Some may argue that the CE concept is too vague due to its lack of a globally agreed upon definition among various stakeholders (Kirchherr, Reike, and Hekkert 2017), while other criticisms relate to the practical implementation and practice of CE. The implementation of the 3Rs has received criticism from different authors. The reduction-principle has been criticized due to its limited goals, as well as its intimation that an economy can survive without any inputs from the ecosystem. This may be harmful to the economy, because maintaining spare capacity, diversity and flexibility often decreases operational risk (Inigo and Blok 2019). The main criticism of the reuse-principle is that it requires a change in consumer attitudes, seeing that many consumers may not prefer reused products due to their attitudes towards fashion and utility of products (Baxter, Aurisicchio, and Childs 2017). Finally, recycle is often criticized because certain materials are downgraded after several numbers of reprocessing cycles, and can therefore not be recycled indefinitely. Moreover, the energy used in certain recycling processes may not always come from renewable sources, which downgrades the positive effect recycling has on the environment (Bilitewski 2012, Stahel 2013).

Gregson et al. (2015) claim that perfect circularity with zero waste is unachievable, which is illustrated by both anaerobic digestion and dry recyclables that produce toxic waste when

being recycled. These materials need to rely on prolonged product life cycles but must depend on landfills and incineration when they are disposed. Sauv , Bernard, and Sloan (2016) argue that it usually is more expensive to produce products with longer life cycles, and therefore represents a huge barrier to the CE. Most firms make decisions based on economic considerations, so they will not produce durable goods if that means less profit to the company. Even if companies were able to improve their resource efficiency and gain economic savings, this may result in lower prices in the market and an increased consumption of the products and resources among consumers (Zink and Geyer 2017).

Kirchherr et al. (2018) investigated in their study from 2018 why it only has been a limited progress in the implementation of the CE concept in the EU. The results found that there are several barriers to accomplish this implementation, such as market, cultural, regulatory and technological barriers. The most prominent obstacle was the cultural barriers, which described the lack of interest and awareness among both consumers and companies. Another important point was the market-barrier of low-priced virgin materials, which inhibits the CE to outcompete the linear consumption model. The authors argue that governmental interventions might help overcome some of the barriers, but there is still no guarantee that the CE concept will succeed. This is also claimed by Sauv , Bernard, and Sloan (2016) where they argue that the cost of developing SCs and infrastructure to facilitate for the CE is too expensive without any intervention by authorities. Against this background, the subsequent section describes CE in SCs.

### **2.3 Circular Economy in Supply Chains**

Supply chain management (SCM) represent strategic importance for all companies. In the recent years, the external pressures, globalization and increased competition has influenced the SCM area to develop optimized processes as well as reducing the cycles of production and delivery. This trend leads towards a more sustainable SC (SSC) focusing on the economic, environmental and social aspects. Furthermore, this trend has evolved into a more holistic concept called circular SCs (CSCs) (Morana 2013).

### 2.3.1 Supply Chain Management

The SCM area has gained attention since the early 1980s and is still growing as a research topic within different areas such as manufacturing, distribution, marketing, customer management and transportation. The popularity can be explained by issues such as global sourcing, time- and quality-based competition, and environmental uncertainty (Mentzer et al. 2001). The concept of SCM has no common agreement on its definition among practitioners and researchers, while the SC, however, is more well-defined (Mentzer et al. 2001). La Londe and Masters (1994, 38) define the SC as *“a set of firms that pass the consumer and industrial products forward, and in order to satisfy the end-customer there are normally several independent firms involved in the manufacturing of products”*.

Some authors have tried to define the concept of SCM, for instance, Jones and Riley (1985) explain that SCM deals with the total flow of materials from the supplier at the beginning of the chain to the end user. Likewise, Cooper, Lambert, and Pagh (1997, 2) define SCM as *“an integrative philosophy to manage the total flow of a distribution channel from supplier to the ultimate user”*. The main concern in these definitions is the material flows, while the focus in the later years has shifted towards other areas within SCM such as risk, performance and integration (Halldórsson et al. 2007, Hassini, Surti, and Searcy 2012, Wilding, Wagner, Colicchia, et al. 2012). In a study by Ahi and Searcy (2013) where 173 definitions of SCM were analyzed, they found that the recent focus in the SCM area is on managing the flows of services, materials and information to create value, improve efficiency and the overall performance in the SC. The expanded SCM area includes more aspects than just the economic, it also includes the environmental and social aspects (Morana 2013, Sarkis and Edward 2019), as illustrated in Figure 2-4 (Savitz and Weber 2014, 75). By this reason, the SC concept will include sustainability concerns, which are investigated in the next section.

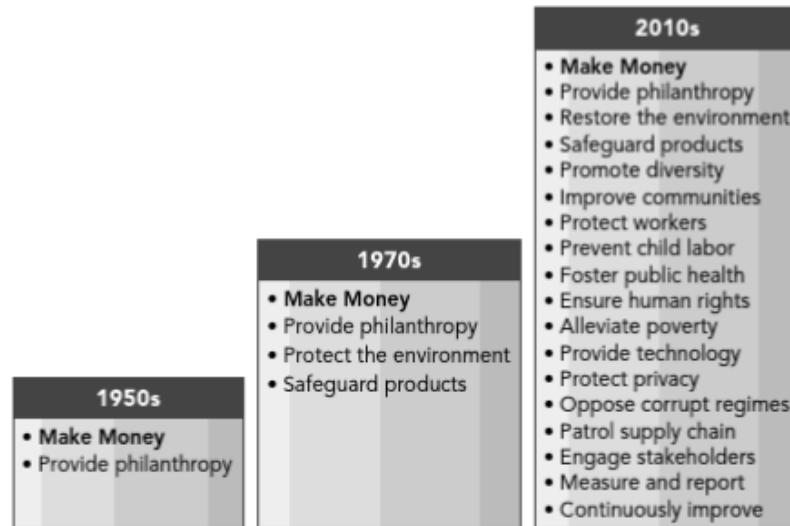


Figure 2-3 The Rise of Corporate Accountability and the Age of Sustainability

### 2.3.2 Sustainable Supply Chain Management

Sustainability was first included in management literature in the early 1990s, and since then its popularity has heavily increased among policy makers, popular press and journals. A general description of a SSC is to use resources to meet the needs of the present without compromising the ability of future generations in meeting their needs (Linton, Klassen, and Jayaraman 2007). A SC cannot survive without input from the outside such as social capital and natural resources, and therefore the external input enables the activities of the SC (Dyllick and Hockerts 2002). Companies need financial resources such as investments and sales revenue, environmental resources such as raw materials and energy, and social resources such as employees' time and infrastructure (Savitz and Weber 2014). Companies depend on their environment to stay competitive and need to secure and maintain the natural environment. By this reason, sustainability has received increased attention to enable a healthy environment (Abbasi 2012). Sustainability as a concept should be integrated into SCM, not separately as an add-on. According to Winter and Knemeyer (2013), the SCM field has an inherent and natural connection to sustainability. SCM and sustainability are linked through the concepts of green SCM (GSCM) and sustainable SCM (SSCM). SSCM is an extension of GSCM, while both address characteristics of SCM with a focus on flow and coordination (Ahi and Searcy 2013). Another linkage is the shift from isolated cost perspectives to create the greatest value along the entire SC (Linton, Klassen, and Jayaraman 2007).

Based on the development of the SCM area and the dependency of the natural environment, sustainability will enhance how companies conduct business. Savitz and Weber (2014) present in their book, three different ways that sustainability enhances business, protecting -, running- and growing the business. *Protecting* concerns knowledge of risk and the ability to mitigate against risk, such as reduce the risk of harm to employees, customers and communities. *Running* can enhance business and includes much of the same components as CE, such as improve productivity, reduce costs and eliminate needless waste. Lastly, *growing* the business has its focus on sustainability. A company can open new markets, launch new products and services, and increase the customer satisfaction and loyalty which is an important factor in CE (Savitz and Weber 2014).

However, there are several challenges in making the SC more sustainable. One of the challenges relates to increased complexity of the SC based on their evolution. For instance, this led to increased transportation and distribution as a result of economic growth. Another example of the increased complexity is the increased consumption and demand for both goods and services through population growth and purchasing power of consumers. Additionally, several examples of complexity are increased business dynamics due to free trade and short product life cycles; increased outsourcing with larger distances between production and consumption; and the number of products evolve because of economies of scope (Abbasi 2012, Morana 2013). In order to mitigate these challenges and to create a more sustainable SC there is a need to work towards a holistic view through CSCs, which is the topic for next section.

### **2.3.3 From Linear to Circular Supply Chains**

Circularity within SCs is a fruitful approach to improve the value, business revenue and environmental impact (Yang et al. 2018). The main purpose for CSCs is to extend the period the materials are kept in use (Ellen MacArthur Foundation 2012). To achieve this, the number of consecutive cycles of the R-framework should be increased or prolonging products durability (De Angelis, Howard, and Miemczyk 2018). According to Batista et al. (2018, 446), CSCs are defined as:

*The coordinated forwards and reverse supply chain via purposeful business ecosystem integration for value creation from product/services, by products and*

*useful waste flows through prolonged life cycles that improve the economic, social and environmental sustainability of organizations.*

SSCM plays a critical role in order to implement a circular strategy (Van Buren et al. 2016). SSCM concerns making the entire SC sustainable and strategically integrate material, information, capital flows and management of the cooperation among all companies in the SC (Carter and Rogers 2008, Wilding, Wagner, Abbasi, et al. 2012). The design of the SSC is important because the entire process from the supplier to the end-customer will change due to the CE focus (Bianchini, Rossi, and Pellegrini 2019). The CSCs divert the used products as waste by recycling value and then reuse in the production of secondary products (Genovese et al. 2017). Additionally, CSCs have huge potential for economic advantages such as cost savings because of reduced packaging waste and design for reuse and disassembly. Another advantage is the reduced health and safety costs due to a safe warehouse and transportation environment, as well as an improvement in the working conditions. Further, the reputation of the company will make the company more attractive to suppliers, customers, potential employees and shareholders (Xu and Cong 2011). To be able to transition from a linear SC to a circular one, there is a prerequisite to change the way business is conducted (Yang et al. 2018). The next section will look into innovation of circular BMs (CBMs).

### **2.3.3.1 Business Model Innovation in a Circular Economy**

All SC operations will be affected by innovations in the BM (Yang et al. 2018). A BM is in general the logic of how a firm conducts business (Teece 2010). The model will describe how the company creates, delivers and captures value for all stakeholders within the network of value. Thereby, there is a need for design and development of new BMs fitted to the CE based on the new sources of value creation (Yang et al. 2018). Linder and Williander (2017, 183) define a CBM as: “*a business model in which the conceptual logic for value creation is based on utilizing the economic value retained in products after use in the production of new offerings*”. All BMs will to a certain extent be a combination of linearity and circularity (Lewandowski 2016). For the transition to a CE, BM innovation (BMI) is a fundamental building block (Planing 2015, Kühl et al. 2019). This is also argued by the Ellen MacArthur Foundation (2014), stating that BMI is crucial in order to mainstream the CE principles in



more business to business (B2B) setups as well as in business to customer (B2C) relationships. There are several components to transform the BM towards including CE principles. The most important component of CBMs is reversed SC logistics (Laubscher and Marinelli 2014), which is presented next.

#### **2.3.3.1.1 Reversed Supply Chain Logistics**

The concept of reverse logistics concern activities in the opposite direction of the traditional SC. Reverse logistics will affect the business by ensuring profitability, increase customer support and at the same time gain competitive advantage (Bonev 2012). In a CE context, reverse logistics and waste valuation operations are considered in addition to the SCM (Eftestøl-Wilhelmsson, Sankari, and Bask 2019). A widely accepted definition of the term reversed logistics is given by Rogers and Tibben-Lembke (2001, 130) as:

*The process of planning, implementing, and controlling the efficient, cost-effective flow of raw materials, in-process inventory, finished goods, and related information from the point of consumption to the point of origin for the purpose of recapturing value or proper disposal.*

The additional activities related to the reverse logistics will according to Guide, Harrison, and Van Wassenhove (2003) be distinguished into five groups. The first activity is to obtain the products from the end-users, while the second is the reverse logistics that moves the products from the user to a point of disposition. Third, the products need to be tested, sorted and disposition to control the conditions of the product, and thereby determine the most economically attractive reuse option. The fourth activity is to refurbish in order to gain the economically attractive option. This can either be done by direct reuse, repair, remanufacture, recycle or disposal. The last and fifth activity is the remarketing to create and exploit markets for refurbished goods and distribute them.

The reverse SC requires challenging and careful design, planning and control. What makes this so complex and challenging is that each type of return demands an appropriate reverse SC to each specific product to optimize the value. Another challenge is that reverse logistics rarely is considered as a business process (Guide, Harrison, and Van Wassenhove 2003), and often isolated from the core business and treated as a silo (van der Valk 2015). This leads to a lack of a holistic approach, which results in a huge potential for failure when trying

to implement closed loop and CSCs. It makes the SC comprehensive and less competitive (De Angelis, Howard, and Miemczyk 2018). Another implication to the silo approach is that managers ignore the importance of speed (Guide, Harrison, and Van Wassenhove 2003), while this is a huge focus in the traditional SC. The holistic view is required to make the SC more circular, therefore, the next section will investigate closed loop SCs (CLSCs) where all activities related to the entire life cycle of the product are included.

#### **2.3.3.1.2 Closed Loop Supply Chains**

A prerequisite to turning the SC operations more circular is firstly the need to shift the linear model into a closed-loop model. The closed-loop model has a more circular design compared to the linear one, therefore, facilitates for a CE (Yang et al. 2018). A CLSC is characterized by performing all regular SC activities, and additionally carrying out reverse logistics. Closed loop SCM is defined by Guide and Van Wassenhove (2009, 10) as, “*the design, control and operation of a system to maximize value creation over the entire life cycle of a product with dynamic recovery of value from different types and volumes of return over time*”. These SCs are regarded as an opportunity to increase a company’s revenue and is not supposed to represent an additional cost (Linton, Klassen, and Jayaraman 2007, Yang et al. 2018).

The change from a linear to a CLSC illustrates that the organization considers environmental management and product life cycle through reduce, reuse and recycle (Guide, Harrison, and Van Wassenhove 2003). However, the implementation of the CLSC into the business is not an easy task. The shift will include new industry standards and focus areas, as well as increase the requirements for investment of resources due to their ability to reuse them. Afterwards, while the product is in use the company need to understand the information flows and distribution in a more detailed way compared to before. When the product reaches the end of the life cycle, a collection system which takes the product back is required, called a reversed process. Additionally, there is a need for continuous coordination of customers, suppliers and non-profit organizations. CLSCs are challenging both in their design and operations because of the balance between the traditional SC activities centered around efficiency and the reverse SC activities (De Angelis, Howard, and Miemczyk 2018). The focus on entirety in CBMs makes it complexed and challenging, and these challenges will be described next.

### **2.3.3.2 Challenges with Circular Business Models**

Several companies consider circularity and saving the environment as a burden and a cost to be minimized. No matter how intelligent and innovative the BM is, some sustainable solutions will never be profitable to the company. By this reason, there is a need for viable BMs combining profitability with environmental sustainability, which maximizes the value of returned products. In order to achieve beneficial BMs, a solution might be legislation to push companies in the right direction and overcome the hurdle. The BMs should be designed to take advantage of all types of product return through their forward SC and the reverse SC, as well as include environmentally friendly disposal. This model is often referred to as the life-cycle approach (Guide, Harrison, and Van Wassenhove 2003).

Linder and Williander (2017) illustrate several benefits with CBM such as cost savings, potential to differentiate and thereby meet low-cost competition, enhanced customer relations, a better understanding of the customer behavior, and reduced environmental impact. There is no doubt that potential benefits exist, on the other side, there is also several challenges and limitations. Customer type is one of the challenges faced by Pearce (2009), as some customers are suitable for remanufactured products and others are not. Another challenge is the requirement for technological expertise about the product to remanufacture (Linder and Williander 2017). A third and widely discussed challenge is the return flow, which is crucial in order to establish the remanufacturing function. A main challenge in this case is related to capacity planning, due to the uncertainty in predictability and reliability of this flow (Östlin, Sundin, and Björkman 2009). According to Östlin, Sundin, and Björkman (2008), the company can mitigate this challenge through closer customer relations. The next section will focus on CE in the service industry.

## **2.4 Circular Economy in the Service Industry**

The growing trend towards CE in the SC has resulted in several studies in the product SCs. However, the service industry is growing and influencing the world economy (Leksono, Suparno, and Vanany 2017) and there are several manufacturers that have the willingness and possibility to become service providers (Yihsing Yang et al. 2013). In spite of that, there is a lack of research on a shift towards CE in the service industry. These areas lack in-depth knowledge (Yihsing Yang et al. 2013), because there are only a few manufacturers in the

service industry that have achieved the ambitious financial objectives (Day and Jung 2000, Matthyssens and Vandenbempt 2008). The next section investigates the service industry and the characteristics of service SCs. Furthermore, the transport industry is explored with the purpose of relating it to the transport service providers, as this is the scope of this study.

### **2.4.1 Service Industry**

The literature concerning service was first conducted early in the 1960s. Today, the literature is still at a youthful stage with different concepts, theories and applications with confusion and no common understanding of service research at an abstract level. An explanation for this confusion is that the service-term is daily used with several meanings and with no globally agreed upon definition (Ellram, Tate, and Billington 2004). Another reason is the numerous debates on the legitimacy of the research as a result of an effort to unify the study of services (Ng, Maull, and Yip 2009). According to Vargo and Lusch (2004), these reasons result in the definition of the services to be more abandoned than resolved. After thirty years of differing literature and no common definition of services, a consensus is emerging that the term service cannot be described and understood by a single academic discipline (Glushko 2008).

According to Qiu (2014, 130), a service can be defined as “*an act of beneficial activity*”. The basic characteristics of a service, and how they differ from goods, is heterogeneity, perishability, client-based relationship, intangibility, inseparability of production and consumption and customer contact (Fisk, Brown, and Bitner 1993). According to Yihsing Yang et al. (2013), a service involves the management of activities based on knowledge where the customer receives value through the intangible output. As the customer requirements increase, it becomes more important for companies to work closely with their clients, as the understanding of the customer is crucial in order to stay competitive (Yihsing Yang et al. 2013). The customer demand is changing and therefore the service industry is increasingly growing (Baltacioglu et al. 2007). As products and services have different characteristics, their SCs also differs. The service SCs will be described next.

### **2.4.1.1 Service Supply Chains**

The concept of service SCs is wide and has gained increased attention in the area of SCM the recent years (Arlbjorn, Freytag, and de Haas 2011). Wang et al. (2015) state that within the SC systems, services play a crucial role. According to Baltacioglu et al. (2007, 112), a service SC can be defined as:

*The network of suppliers, service providers, consumers and other supporting units that performs the functions of transaction of resources requires to produce services; transformation of these resources into supporting and core services; and the delivery of these services to customers.*

Research has concluded that the three basic elements in the service SC include, customers, service integrators and service providers, as illustrated in Figure 2-6 (Sakhuja and Jain 2012, 7). The customer demands services forwarded to the service integrator. The service integrator is often categorized as the core element in the service SC because of their responsibilities for managing customer demand, which is called demand management capability. To deliver appropriate services to the customer, the key is to manage the capacity to service operations, thus, selecting capable service providers to perform the demanded service. Next, the service will be customized and finally delivered to the final customer through a service delivery system (Sakhuja and Jain 2012). Service SCs can be divided into two types, service only SC (SOSC) and product service SC (PSSC). SOSC is characterized by pure services as the output, while PSSC have outputs that is a combination of both services and products (Wang et al. 2015).

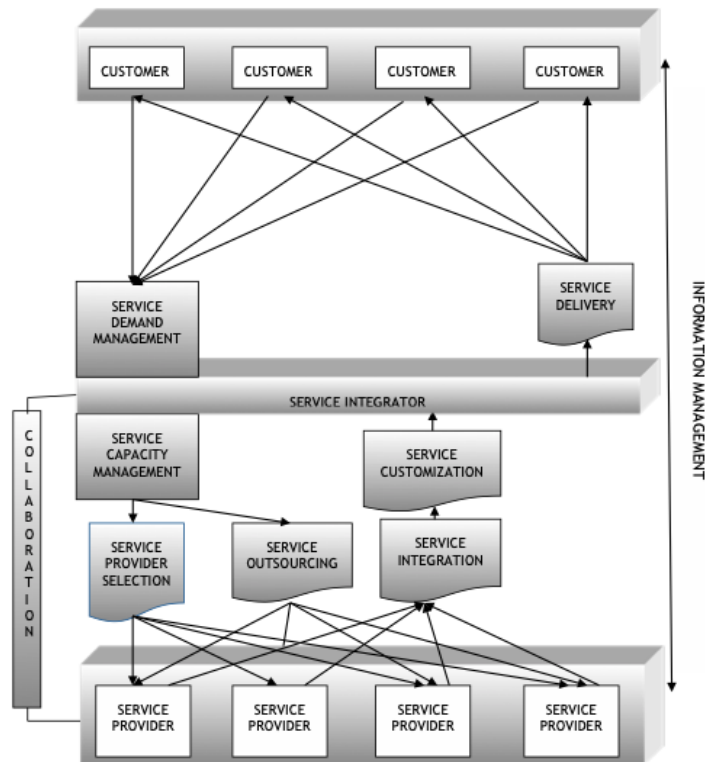


Figure 2-4 An Integrated Conceptual Framework for Service SC

The structure of service SCs have both some similarities and differences with product SCs. A similarity is that both services and products are created, purchased and transferred from one point to another in the SC (Song and Xu 2011). Sengupta, Heiser, and Cook (2006) highlight several important elements in both SCs such as demand -, customer relationship -, and supplier relationship management. A main difference between product SCs and service SCs are the suppliers. In service SCs, the suppliers are the customers (Sampson 2000). During the value delivery process in service SC, human labor is a significant component (Ellram, Tate, and Billington 2004), as the customer is highly involved in the SC processes (Hussain, Khan, and Al-Aomar 2016). The focus on efficiency is also different in the two types of SCs, where capacity management, flexibility of resources, information flows, service performance, and management of cash flow is important to achieve efficiency in the service SC (Cho et al. 2012).

From the existing research about service SCs, several drawbacks have been discovered. First, there is no existing model and the metrics used have limitations (Cho et al. 2012, Estampe et al. 2013). Second, the measurement of service quality for customer satisfaction has no standard instrument (Seth, Deshmukh, and Vrat 2006). The third disadvantage,

discovered by several researchers, is based on communication problems, as there is a lack of conflict discussion across the SC actors (Bichou and Gray 2004, Cutting-Decelle et al. 2007, Seth, Deshmukh, and Vrat 2006). These problems increase as the SCs goals are based on several focus areas such as economic, environmental and social (Blanchard, Comm, and Mathaisel 2008, Chardine-Baumann and Botta-Genoulaz 2014, Comm and Mathaisel 2008). The literature about CSCs in the service industry are, as previously mentioned, in an early stage. The first step of increasing the literature on this topic is to investigate SSCM in the service industry.

#### **2.4.1.2 Sustainable Supply Chain Management in the Service Industry**

SSCM in the service industry is in an infancy stage. The challenges in the service industry are the same as in the manufacturing industry, to reduce the impacts on both the environment and society, while increasing the bottom line (Hussain, Khan, and Al-Aomar 2016). A study conducted by Hasan (2013) indicate that both manufacturing and service firms will increase the environmental performance through sustainable SC practices. Another contribution to sustainability in the service industry is by Hussain, Khan, and Al-Aomar (2016), who identified indicators of how sustainability is assessed in the service SCs. The study resulted in four variables for sustainability: environment management; social responsibility; health, safety and risk management; and customer management. The management of customer and environment is highly correlated. Consumers are increasingly aware of the benefits of services that are environmentally friendly. Therefore, green practices are a key to create well-established customer relationships. Customer management is also correlated with social responsibility. This means that the customer gets a perception of the performance of the company and this is an indicator of its responsibility towards the customers (Hussain, Khan, and Al-Aomar 2016). By keeping the requirements from the customer in mind, there is a need to understand the service element and its power to stay competitive. This phenomenon is called servitization and is explored in the next section.

#### **2.4.2 Servitization**

In the 1980s, the interest for moving away from selling products to providing the combinations of goods and services emerged (Vandermerwe and Rada 1988). In order to stay competitive, manufacturers are transforming into the manufacturing service industry to

increase value creation (Yihsing Yang et al. 2013). This phenomenon is called servitization and was invented because of increased competition (Baines and Lightfoot 2014, Rogelio and Robert 2003). Morelli (2003) sees servitization as the transformation from product identity based on material content to a situation where the material components are connected to the service system. The CSC requires a service friendly, relationship-based approach. To achieve this there are many techniques to use such as lifecycle analysis, leasing and through-life management. Some companies have applied circular strategies such as rent in their SC through adopting servitized elements. Technology systems will gain benefits within this concept through controlling the flow of material returns and monitor product performance over the lifecycle, and thereby achieve increased efficiency. This will also contribute to closer customer relationships, as the relationships across the SC network will change in a CSC because the product ownership is shifted from the customer to the company (De Angelis, Howard, and Miemczyk 2018).

Rogelio and Robert (2003) present three reasons for why the integration between products and services is beneficial. The first reason is the economic arguments. Products with long life cycles can generate high revenue, while services have an overall higher margin and are a larger source of revenue than products (Anderson, Fornell, and Rust 1997). According to Wise and Baumgartner (1999), services contribute to 30 times more turnover for a company than products, as services are more resistant to the economic cycles contributing to investment and equipment purchases (Quinn 1992). Second, the customers are increasingly requiring services, because products are becoming more complex and advanced, which require supporting services to ensure the right performance for the customer (Kumar, Markeset, and Kumar 2004). This trend requires flexible firms and leads toward outsourcing because of core competencies and technological complexities (Lojo 2000), which will increase efficiency and effectiveness (Baltacioglu et al. 2007). The last reason is the competition. Services are by nature less visible and dependent on more labor, and therefore more difficult to imitate (Sasser, Schlesinger, and Heskett 1997). The servitization area is increasing and will be relevant for the next section, where the focus will turn into the transport industry. The transport industry is a huge contributor for the environmental challenges we face today, therefore, this is an investment area in this study (Circle Economy 2020b, Ellen MacArthur Foundation 2015).



### 2.4.3 Circular Economy in the Transport Industry

Transport and logistics are some of the main sources contributing to emissions of GHGs. For instance, about 30 percent of the total GHG emissions in Norway come from transport and distribution, where half of these emissions stem from road traffic. Mobility also contributes to metal and plastic usage, and the packaging used in the distribution is a huge source of waste. Therefore, improved logistics and distribution systems represent large opportunities to reduce the use of energy and resources (Deloitte 2020). The transport system can be classified as a holistic system and a critical part of increasing energy efficiency is by reducing emissions and improving the fuel consumption of vehicles. Sustainable transport options need to be utilized in the market, such as electric cars and by turning the city streets more biker friendly (Eftestøl-Wilhelmsson, Sankari, and Bask 2019).

As put by Bhavesh and Chetan (2020), an effective way to implement CE into freight services is to utilize the reduction principle in the R-framework. This implies, for instance, reducing the fuel consumption, the overall kilometers traveled, and delivery times during the day. In a report by the transport company DHL (2016), they propose to use the opportunities offered by the CE in their operations to meet the challenges of sustainability. They base this shift on four main areas of action: rethinking reverse logistics, peer-to-peer (P2P) drop-off networks, fourth party logistics (4PL) solutions, and eco-efficient packaging. This is illustrated in their model (Figure 2-7) (DHL 2016, 20).

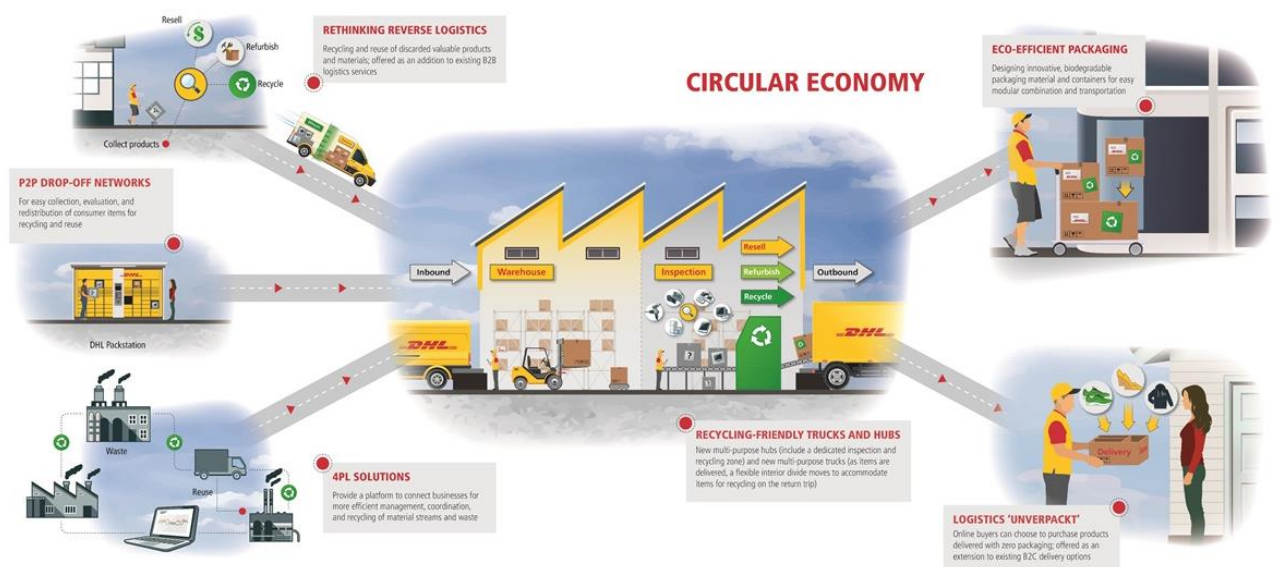


Figure 2-5 DHL CE Main Actions

The first main action, rethinking reverse logistics, refers to their focus on recycling and reuse of valuable products and materials received from the consumers. This requires DHL to invest in multi-purpose vehicles, where the cargo space is divided into two parts: the place for packages to be delivered and storage for the collected goods. This is not only environmentally friendly due to its contribution in facilitating for reuse and recycling, but it also reduces the amount of near-empty delivery vehicles on the road (DHL 2016). According to Ranieri et al. (2018), a key strategy in reducing the negative environmental impact of freight services is by utilizing the full capacity of every vehicle, thus, reducing the number of vehicles on the road. Still, there are challenges to reducing the negative environmental impact of vehicles, especially for urban freight last-mile logistics (LML). Freight LML is the contact point between the consumers and the service provider which is found in the final part of the SC, but it is considered the most expensive and polluting part. Therefore, it is argued that vehicles which run on alternative energy sources, such as electric cars and bikes, are the preferred choice to reduce the pollution from urban freight LML. Additionally, digitalization may be used to optimize the sustainability of the SC through smart warehousing, interconnected logistics systems and advanced information analysis tools (Techane 2020).

Second, P2P drop-off networks are individual stations where the goods collected from the customers are stored, evaluated and redistributed before the reuse or recycle process. Optimally, the neighboring buildings to the drop-off stations are where the repair and recycling process takes place, as it saves the transport service provider from driving large distances to deliver and collect the materials. DHL sees these stations as necessary in order to facilitate for a fast resale process of goods, while contributing to a transition towards CE (DHL 2016). It is also argued by Slavova and Bankova (2017) that cooperating with neighboring companies in clusters is effective to achieve sustainability goals. A cluster is defined as *“a geographic concentration of interconnected companies and associated institutions in a particular field, which are community bound and mutually complementing”* (Porter 2000, 18). Practicing a cluster approach offers several benefits, such as cooperation leading to innovation, reduced complexity in implementing sustainable solutions, synergies by adopting complementing initiatives, and improved capabilities (Slavova and Bankova 2017).

Third, through becoming a 4PL provider DHL can facilitate for effective waste management (DHL 2016). A lot of firms lack knowledge about how to improve their waste management, and how their waste may fit as resources into another process (Ellen MacArthur Foundation 2015). A logistics provider, however, generally has a good overview of other local companies, and their activities. Therefore, DHL as a transport service provider could handle the job as a match maker between these companies, as well as operate the transportation of the materials. This type of matchmaking process may result in an increase in efficient transport and warehousing, reduce the transport volumes, and minimize the use of middlemen such as waste management companies, which may contribute to reducing the barriers of closing the loop of material streams (DHL 2016).

Lastly, by promoting eco-efficient and zero-waste packaging, the waste along the entire value chain gets reduced (DHL 2016). According to Orzan et al. (2018) eco-packaging needs to be safe and healthy for the user and the community; be cost-efficient; be obtained, produced, transported and recycled by using renewable energy sources; and have the ability to effectively be reused and recycled in many production cycles. This will not only be beneficial for the environment but might also provide the companies with a competitive advantage, especially among green consumers. DHL (2016) aims at cooperating with several players in the logistics industry as well as their customers to implement the use of this eco-efficient packaging. For instance, the products might be shipped in reusable boxes, with no additional bubble wrap, air pockets, plastic packaging or cardboard boxes. When delivered, the customer will take the product out of the reusable box, resulting in zero packaging waste.

## **2.5 Chapter Summary**

The literature presented has the purpose to support and justify the arguments used in answering the research problem of this study. The literature of CE such as definitions, characteristics and components are a key for this study. Next, basic literature about SCM is essential to understand how the companies does business and how this will be affected by implementing CE principles. In addition to this, the service industry is investigated to understand how CE strategies will affect companies in this sector. As far as one can see, the literature lacks aspects of CE in the service industry. For example, there are no evidence and documentation of how CE concepts will affect the value chain of companies in this sector. The next chapter presents the methodology employed by this study in answering the RQs.

## **3.0 Methodology**

### **3.1 Chapter Introduction**

According to O’Gorman and MacIntosh (2015), the methodology chapter offers a structured approach to identify the choices that have been made regarding the research design of the study. The main purpose behind explaining every decision of the research design is to facilitate for future replication. This chapter is largely based on the research onion, which is a model developed by Saunders, Lewis, and Thornhill (2007). The research onion consists of several layers that a researcher must pass when conducting a study and developing an effective methodology. The layers included are research philosophy, approach, strategy, method, time horizons, and data collection and analysis. Additionally, this chapter explains the validity and reliability of the study, as well as introduces the five case companies (where one is a service provider and the remaining four, its customers).

### **3.2 Research Philosophy**

The research philosophy of a study is related to the development of knowledge and its nature. The chosen research philosophy contains assumptions of how the researcher views the world, which underpins the selection of research strategy. According to Saunders, Lewis, and Thornhill (2012), there are three different perspectives to consider in the research philosophy: epistemology, ontology and axiology.

*Epistemology* deals with what the researcher considers as acceptable knowledge in their field of study and can be divided into three different perspectives: positivism, realism, and interpretivism (Saunders, Lewis, and Thornhill 2012). First, if a researcher adopts positivism as their research philosophy, they are most likely to work with phenomena that can be observed. Here, a hypothesis will be developed based on existing theory, and further tested and confirmed (Remenyi et al. 1998). Second, realism also relates to scientific enquiry, but differs from positivism as it believes that the external world exists independent of the human mind. Third, interpretivism is a philosophy which allows researchers to interpret the elements in the study in order to understand a social phenomenon. This is commonly used when the object of the study are humans instead of objects such as computers and numbers

(Saunders, Lewis, and Thornhill 2012). In this study, interpretivism is used as the research philosophy in the field of epistemology. Here, the phenomenon of how CE principles can transform the service value chain have been investigated through collecting data and interpreting it in accordance with human actions and beliefs. This is because the data collected are from interviews with humans that work at the studied case companies, and their beliefs, experiences and predictions are considered. Therefore, the four RQs are answered by analyzing, interpreting and comparing data from humans, and cannot be tested and confirmed by using numbers and statistics (Saunders, Lewis, and Thornhill 2012).

*Ontology* concerns the nature of reality, as it questions the assumptions most researchers have about the world and their individual views. There are two aspects of ontology, objectivism and subjectivism. Objectivism focuses on structure and emphasizes that social entities exist independent of social actors. Subjectivism, however, believes that a phenomenon exists due to social actors' perceptions and actions. It builds on the belief that a researcher must explore the subjective meanings of humans in order to truly understand their actions. This study is based on subjectivism, as the opinions and beliefs of humans are considered to understand how the service providers' value chains might transform, as well as what challenges they might face and how they can overcome them. For instance, the challenges are believed to exist due to the respondents' perceptions and cannot truly be understood and mitigated unless we explore their subjective opinions (Saunders, Lewis, and Thornhill 2012).

*Axiology* studies the researcher's judgement about value. This is because the researcher's values may play a significant role in each state of the research and needs to be kept in mind for the result to be credible (Saunders, Lewis, and Thornhill 2012). Heron (1996) argues that humans' values are the main reason for their actions, which means that a researcher's values will affect the judgment of how to conduct the research. The choice of philosophical approach in a study reflects the values of the researcher. For instance, this study has chosen interviews as the preferred form for data collection, which implies that we value personal interaction with the respondents more than anonymous data. It is important that we are aware of our values, as it makes it easier to argue our position if the research decisions are being questioned. The decisions made in this study imply that we value human opinions and perceptions to answer the RQs (Saunders, Lewis, and Thornhill 2012).

### 3.3 Research Approach

The research approach concerns to what extent the researcher is clear about the theory at the beginning of the study. The most common approaches to adopt is a deductive or an inductive approach (Saunders, Lewis, and Thornhill 2007). In addition, there is a third approach called abductive reasoning. *Abduction* begins with an observed surprising fact (Ketokivi and Mantere 2010). This fact is a conclusion and based on this, a set of possible premises are determined and considered as either sufficient or nearly sufficient to explain the conclusion (Saunders et al. 2015). *Deduction* is when the researcher develops a hypothesis and designs a research strategy to test this hypothesis. This approach is commonly used in the natural sciences and concerns testing already existing theory. As deduction concerns testing theory, the goal of *induction* is to build theory. The inductive approach has its origins in the social sciences, and it criticizes the deductive approach by arguing that building rigid methodology that does not give alternative explanations to reality is not always the best choice. As deduction offers a highly structured methodology, induction follows a less structured approach which might reveal alternative explanations to reality. It is also recommended to use a small sample of subjects when using an inductive research approach, and it is most common to use qualitative data (Saunders, Lewis, and Thornhill 2007).

This study had adopted an inductive approach, as its goal was to build theory rather than testing it. A small sample of subjects were interviewed to obtain qualitative data and answer the four RQs. As the goal was to build theory, the respondents' beliefs and perceptions were included to truly understand the phenomenon of how CE strategies can transform the service value chain. To be able to answer the RQs and fill the gaps in the literature, there was a need for detailed data. The qualitative data has contributed to documentation and insight into different customers SCs in varying industries. This is decisive to answer how CE strategies affects the transport service providers' value chain. Based on the gaps in the literature explained in the introduction, the area we wanted insight into is unknown, and therefore, the approach should not be structured and fixed in order to conduct valuable and appropriate data. As the research approach is decided, the next step is to clarify the research strategy.

### **3.4 Research Strategy**

The research strategy reflects the purpose of the study (Saunders, Lewis, and Thornhill 2012). This thesis is categorized as an exploratory multiple case study. According to Saunders, Lewis, and Thornhill (2012), an exploratory study aims to seek new insights and understandings of a phenomenon, and to assess this phenomenon in a new light. This thesis is exploratory because of the lack of theory on the specific topic. Due to the gaps in the academic literature, this study was flexible and adaptable to changes as new data and insight occurred.

Furthermore, a case study approach is commonly used when conducting an exploratory study because it allows the researcher to gain a rich understanding of the context of the research. Yin (2009) distinguishes between single and multiple case studies. A single case study is typically chosen when the researchers want to investigate a critical or unique case, while a multiple case study is usually applied to establish whether a phenomenon occurs in several cases. By this reason, Yin (2009) argues that multiple case studies are preferable, as they offer generalization. To understand the context of the research in a detailed way, this study used a multiple case study approach. The aim of this study is to explore how a real time transport service provider's value chain can be affected by adoption of CE strategies by both itself and its customers. This area is, as far as we know, not investigated yet and there is a need for documentation and evidence to build theory. The unit of analysis in this study is the company itself. To increase insight, we looked at the service provider called Helthjem and four of their customers as embedded cases to explore the phenomena and the context. The study has multiple sources of evidence with four customers from different industries, which are companies that procure a distribution service from Helthjem to support their own business. Based on the lack of literature, the use of several cases and multiple sources is beneficial to answer questions such as: why, what and how. In this study, this includes how circular the companies are, what CE strategies they have adopted and planning to adopt, how this will affect the service provider's value chain, what challenges this might bring, and how they should face them (Saunders, Lewis, and Thornhill 2012).

Further, the case selection is important in the case study. On some occasions it is possible to collect and analyze data from every case or member in a population, which is called census. Still, often it is impossible to collect all the available data. In this study, it was impossible to

collect data from every member in the population and therefore a sample was used. The sample represented a subgroup in the population and data were collected from them instead of the whole population. The population in this study was all of Helthjem’s customers, but only four were chosen as the sample, as illustrated in Table 3-1. This number of customers was chosen because it was both too impractical and time-consuming to investigate the whole population. It is important that the sample chosen is representable for the entire population, because it increases the credibility of the study’s result (Saunders, Lewis, and Thornhill 2007). To ensure credibility, the customers represent different industries, which made it possible to investigate the RQs from different customer perspectives. The customers are also selected based on their interest in CE and their willingness to contribute to this study. The next section presents the case companies. All the information presented about the customers were obtained during the interviews, while the information about Helthjem was derived from both interviews and online articles.

Table 3-1 Overview of the Case Companies

Company	Industry	Characteristics
<b>Helthjem</b>	Distribution/Transportation	Large focus on sustainability Utilizing existing networks
<b>Bergans</b>	Outdoor Clothing and Equipment	Well-known brand Large focus on sustainability Durable products
<b>Finn.no</b>	Second-Hand Market	Well-known brand name Large number of customers Profitable for Helthjem Online platform
<b>Greenphones</b>	Electronics	Relatively new Up and coming
<b>Red Cross</b>	Clothing Donation	Small percentage of deliveries Not profitable for Helthjem

### ***Helthjem***

Helthjem is a transport company that delivers transport services for small packages, magazines and newspapers in Norway. The company was established in 2015 by the three media groups Schibsted, Amedia and Polaris. Today, more than 1.3 million products are shipped in the network each night, six days per week (Helthjem n.d.-e). Helthjem offers freight services in different markets, such as B2B, B2C and Customer-to-Customer (C2C), as well as easy and reliable return services (Helthjem n.d.-f). The main idea behind Helthjem is to utilize the already existing distribution network for newspapers in Norway. Schibsted, Amedia and Polaris all have large distribution networks for newspapers at different locations



in Norway, and by cooperating with Agderposten and Sunnhordaland Distribusjon, they are covering most areas in the Norwegian market (Schibsted Distribusjon 2016). Therefore, each night when newspapers are delivered at the customers' doorsteps, packages will also be delivered or collected by the newspaper carriers (Helthjem n.d.-a).

Sustainable and environmentally friendly solutions are an important part of Helthjem's strategy. Their sustainability goals are to reduce their use of plastic with 90 percent by 2022, reduce their Co2-emissions with 50 percent by 2025, and facilitate for the consumer to pick green and sustainable options. To achieve these goals Helthjem have, among other things, invested in electric bikes, cars, and Paxsters, which result in a 70 percent decrease in Co2-emissions in their LML. In urban areas, such as Oslo, over 80 percent of their newspaper carriers deliver products by foot, which generates no emissions (Helthjem n.d.-c). Helthjem also finds it important to facilitate for a circular consumption pattern among consumers. In their door-to-door delivering service, over 80 percent of the products transported are related to used products bought at online marketplaces, such as Finn.no, Tise, and Facebook. Helthjem argues that in order to reduce the negative environmental impact, adopting CE principles such as rent, reuse, and prolonging products' lifetime is key. Furthermore, they argue that reliable and well-timed transportation services is very important to make circular solutions the convenient choice among consumers (Helthjem n.d.-d).

According to the CEO of Schibsted Distribusjon, both Helthjem's customers and partners are gaining an increasing interest in environmentally friendly solutions. Therefore, they are expecting Helthjem to have a large focus on sustainability (Helthjem n.d.-b). This was also confirmed during an interview with Helthjem. They further explain that large customers may demand an upper limit of Co2-emissions per shipped package, which challenges Helthjem to find new and sustainable solutions. They also experience an increasing trend among their customers to adopt CE principles such as rent, reuse and repair, which may represent challenges for Helthjem. It is suspected that it might raise issues related to reliability, speed, and risk in their value chain. Due to their competitive environment, it is crucial to detect these challenges early and develop measures in the value chain to face them.

To understand the internal process at Helthjem, an example of a product's journey from C2C was given during their interview. This journey is illustrated in a flow chart found in Figure 3-1. The shipments have different registration points throughout the entire shipping process to ensure traceability. At the point in time when the interview was conducted, Helthjem was operating with five different points of registration: when the shipment is collected, when it arrives at the first terminal, at the second terminal, at the second carrier hub before delivery, and when it is delivered. Still, Helthjem pointed out that they are working on adding more points of registration, such as when the packages are loaded onto the cars.

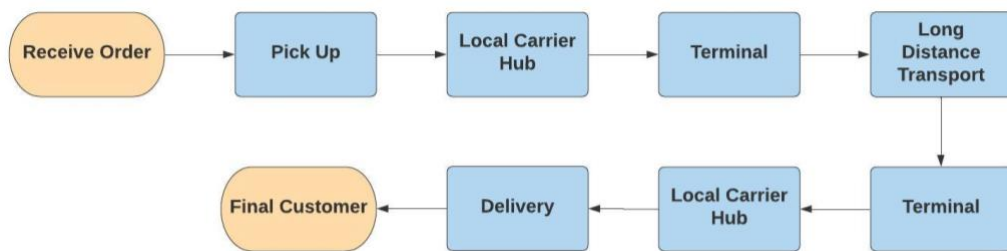


Figure 3-1 Flowchart Helthjem

### ***Finn.no***

Finn.no is an online platform and advertisement website with different sections devoted to vehicles, jobs, real estate, travel, and for-sale. The respondent from Finn.no primarily works with their for-sale section, named “Torget”. At Torget both private consumers and companies can post ads for products such as furniture, clothes, and electronic equipment. The consumers and companies can post both new and used products at the for-sale section, but the dominant category is used products. It is free to post ads at Torget, because Finn.no wants to facilitate for easy access to second-hand products among private consumers. As said by the respondent: *“We want to contribute to letting the consumer lift the product up in the circular cycle and ensure reuse over a long period of time”*.

At Finn.no, a product's journey from seller to buyer begins with a private consumer or company posting an ad at Torget, as illustrated in Figure 3-2. The sellers at Torget can either deliver it personally or ship it through a transport service provider, where they have the option to select Helthjem as the company to transport their products directly at the Finn.no-website. Still, some users choose other transport service providers to transport their products,

but this is not possible to order directly through the Finn.no website. At the point in time of the interview, Finn.no had been a customer of Helthjem for about four years.

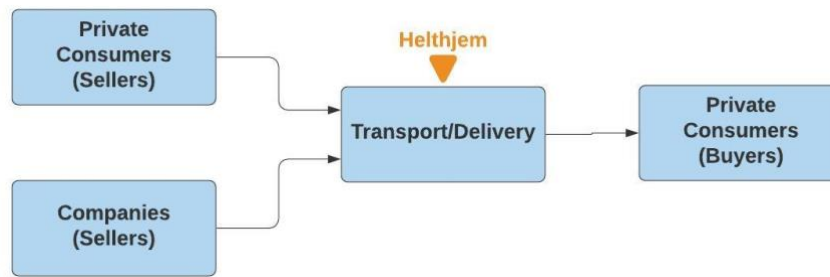


Figure 3-2 Finn.no SC

### ***Greenphones***

Greenphones is a company that aims at buying and selling used mobile phones, as well as repairing them. The main idea is that consumers go into Greenphones' website, registers their used phone, and then receives an offer if Greenphones wants to buy their mobile phone. The phone is then shipped to Greenphones, they inspect and repair it, and sell it to another consumer. They also have a small portion of customers in the business market, where the goal is for these customers to both sell and buy phones at the same time. Greenphones is rapidly growing and at the time of the interview they were buying about 180 phones from consumers each week. In Greenphones' SC about 80-90 percent of their phones are bought from private individuals. These phones are either acquired through their website or from private consumers that comes to their store in Tvedestrand, as illustrated in Figure 3-3. Additionally, they buy some parts and materials from their suppliers, but the only new materials they procure are headphones, phone covers, and parts to repair the phones. When the used mobile phones arrive at Greenphones, they are inspected, repaired, cosmetically fixed, and posted on their website for sale. At the point in time of the interview, Greenphones had not yet started using Helthjem as their transport service provider. However, their plan moving forward was for Helthjem to transport sold phones to the private consumers and companies.

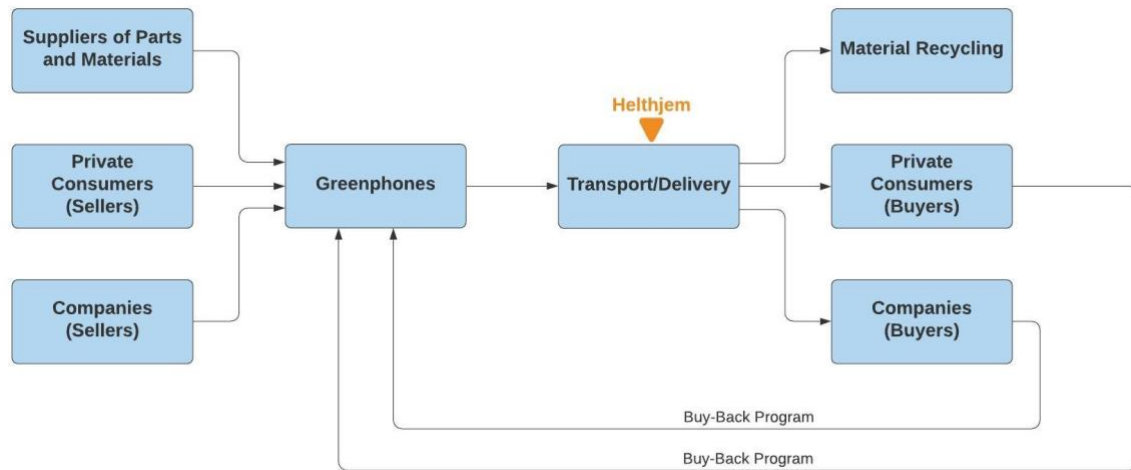


Figure 3-3 Greenphones SC

### ***Bergans***

Bergans is a Norwegian company that produces and develops clothes and equipment for the outdoor sector. Bergans sell most of their products in Norway, but they also have established markets in Sweden and Germany. Traditionally, they have sold their products through other retailers, but have the past four years moved most of their sales to their own brand stores and web shop. A key part of Bergans' strategy is to produce products of high quality, as they consider it crucial when facing the sustainability issues. As said by the respondent:

*Since we are selling products that are used outdoors, we care deeply about the nature. We need fresh air and a healthy and nice nature with good trails and easy possibilities for outdoor activities. Therefore, sustainability is highly prioritized on our agenda - Bergans*

Bergans' SC begins with a design process at Asker in Norway, as shown in Figure 3-4. Their suppliers are located all around the world, mainly in China and Vietnam, but also some in Europe. At the point in time of the interview, Helthjem's transport services had for about two years been used at a pilot project for snowsuits for kids. The main idea behind the pilot project is for parents to rent snowsuits for their kids through a subscription service instead of buying them, and then returning them at the end of the season. Helthjem transports the snowsuits both to the consumer and handles the return service back to Bergans at the end of the season, so Bergans can clean and repair the snowsuits at their location in Oslo before renting them to new customers.

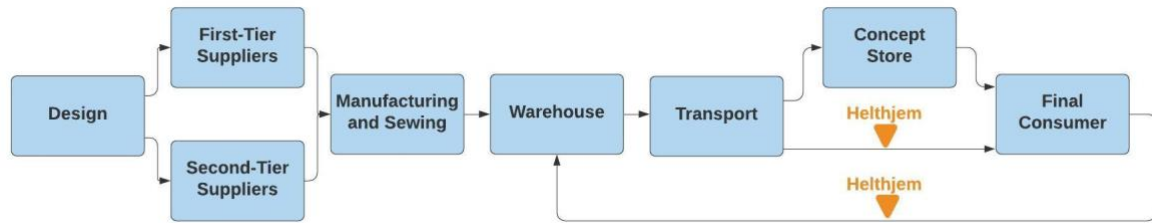


Figure 3-4 Bergans SC

### Red Cross

Røde Kors Tøy og Tekstil AS is a part of the Norwegian Red Cross and will therefore in this study be referred to as Red Cross. They are a company that collects used clothes and fabrics which are donated to the Norwegian Red Cross, and further sells them as a wholesaler. They sell the clothes and fabrics as they are collected, there is no sorting of the clothes and they do not own any stores themselves. Their biggest customer is the British Red Cross, as they own several thrift stores throughout the UK. In 2020, Red Cross collected 800 tons of used clothes, while the biggest player in the Norwegian market, Fretex, collected 17.000 tons. Therefore, Red Cross sees themselves as a small player in the market. As illustrated in Figure 3-5, Red Cross' SC begins with the private consumers wanting to donate used clothes. Helthjem have in cooperation with Red Cross offered a home collection service since 2018, where the main idea is that the consumers leave a bag of used clothes at their doorstep which Helthjem's carriers picks up. Further, the next step in the research onion is to decide on the research method for the study.

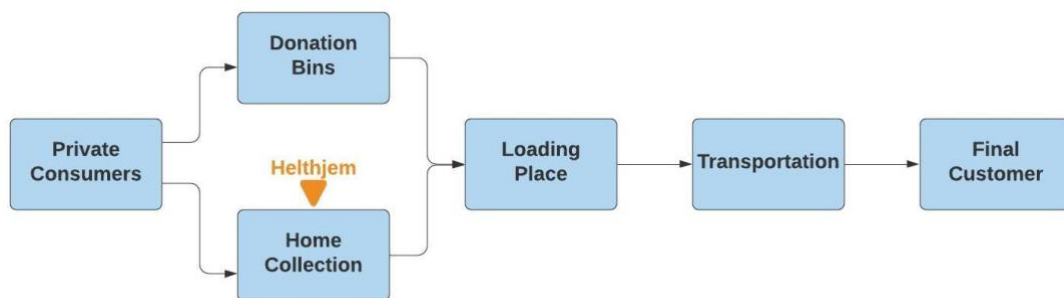


Figure 3-5 Røde Kors Tøy og Tekstil AS SC

### 3.5 Research Method

According to Ruane (2016), a research method can either be quantitative or qualitative depending on the data. Quantitative research is an approach that documents variables by relying on numbers in large samples, while qualitative research documents the reality by relying on words and images in smaller samples. This exploratory multiple case study has produced qualitative data; therefore, the research method of this thesis is qualitative. There are several different definitions of qualitative research and a well-known one is by Van Maanen (1979, 520), who defines it as “*an umbrella term covering an array of interpretive techniques which seek to describe, decode, translate, and otherwise come to terms with the meaning, not the frequency, of certain more or less naturally occurring phenomena in the social world*”.

Even though several definitions of qualitative research exist, most researchers have identified four characteristics as key in this research method which is applied in this study. First, the focus is on *process, understanding, and meaning* (Merriam and Tisdell 2015). The goal in this study was to understand the phenomena from the participants’ perspectives, not from the researchers’ point of views. Second, *the researcher is the primary instrument* to collect data and conduct the analysis. Since the goal of this qualitative research was to gain an understanding of a phenomenon, the researchers of this study were responsive and adaptive in the collection and the analysis of data. In addition, verbal and non-verbal communication were used to increase the understanding. Third, *qualitative research is an inductive process* (Ruane 2016). Based on the lack of theory on the given phenomenon, the researchers collected data to build theories and concepts. Fourth, *the product is richly descriptive* (Merriam and Tisdell 2015), which means that pictures and words were used when presenting the findings of the research. The next step is to decide on the study’s time horizon, which is explained in the following section.

### 3.6 Time Horizons

When conducting a study, the researcher must decide on what time horizon is the most appropriate. The study can either reflect a snapshot of a particular time, or describe a phenomenon happening over a given period. The time horizon can be distinguished between using either a longitudinal study or cross-sectional study. A *longitudinal study* concerns

change and development over time, while a *cross-sectional study* investigates a phenomenon at a particular time and is commonly used for studies with a time constraint. Here, the researcher typically uses surveys or interviews conducted over a short period of time (Saunders, Lewis, and Thornhill 2007). This study is cross-sectional, as there is a restricted time period and limited access to previously published data on the topic. Once the time horizon of the study is decided, the final step is to decide on the method for data collection and analysis, discussed next.

### **3.7 Data Collection and Analysis**

The research model should be designed in an appropriate way to collect the required data and information to answer the RQs. According to Merriam and Tisdell (2015), there are three types of design when gathering qualitative data, interviews, observation, and mining data from documents and artifacts. Data collection in an exploratory study is usually conducted by a search of literature, individual in-depth interviews and/or focus group interviews (Saunders, Lewis, and Thornhill 2012). This exploratory single case study has used two different design-methods, interviews to obtain primary data and a literature search to obtain secondary data. Finally, the data were analyzed to provide valuable results.

#### **3.7.1 Interviews**

Interviews are a systematic activity and one of the most common techniques for data collection with the purpose to obtain a special kind of information (Merriam and Tisdell 2015). According to DeMarrais (2004, 55), a research interview can be defined as “*a process in which a researcher interviews a conversation focused on questions related to a research study*”. The collection of data can take different forms, where the most common is person-to-person encounter. Another well-known form is group interviews or a collective format. Both methods are defined as “*conversations with a purpose*” (Dexter 2006, 136).

Interviews can be categorized into different types, often based on their desired amount of structure. The three main types are named, highly structured, semi-structured and unstructured. The highly structured interviews have predetermined questions, often standardized, where the interview is an oral form or a written survey. The semi-structured

interviews consist of a mix of more or less structured interview questions. The data required from all participants are often specific and the questions used are flexible. Semi-structured interviews have the advantage to make the researcher able to respond to the situation at hand. The last type, unstructured, is open-ended questions with the characteristics to be flexible and exploratory. This type is more like a conversation and useful when the researcher lacks knowledge about the phenomena (Merriam and Tisdell 2015, Saunders, Lewis, and Thornhill 2007). This study used semi-structured interviews with a mix of more or less structured interview questions. The data required from the participants were specific and the questions used were flexible. This kind of interview made the researchers of this study able to respond to the answers from the respondents at hand. This was beneficial when exploring a new topic with a lack of research because the research process was flexible and inductive, and changes occurred as new data were gathered. All the case companies were interviewed in this way, and the customers covered different industries such as retail, electronic equipment, and online platforms. As such, our study is more in-depth and is not affected by trends in individual industries.

Furthermore, a description of the interaction with the case companies and interviews conducted is presented in Table 3-2. All the interviews were recorded with the consent from the respondents. These recordings were afterwards transcribed verbatim. The interviewers were the same for all interviews, the two researchers of this study, where one was the moderator to make it easy for the respondent. The duration of the interviews extended from half an hour to an hour and 15 minutes. The difference can be explained by how consistent they answered the questions and how much they derailed on other topics. It is worth mentioning that due to the Covid-19 pandemic, these interviews were conducted online. Thus, these online interviews were conducted in real time through computer mediated communication (CMC) tools such as Zoom and Teams. These interviews were characterized by verbal communication with a video as a face-to-face interview. Besides, online interviews were also done asynchronously over email and in an online discussion forum. This means there was a lag time and text-based or written interviews (Merriam and Tisdell 2015). However, the downside to conducting such digital interviews is that we were not able to capture body language and eye contact, as we would face to face.



Table 3-2 Interactions with Companies

Company	Respondents	Type	Date	Interviews	
				Duration	Interviewers
Helthjem	Business Development and Innovation Manager	Email	06 July 2020		
Helthjem	Business Development and Innovation Manager	Email	23 August 2020		
Helthjem	Business Development and Innovation Manager	Interview	25 September 2020	01:00:00	2 researchers
Helthjem	Business Development and Innovation Manager	Email	25 November 2020		
Red Cross	CEO	Email	27 November 2020		
Finn.no	Product Director at Finn Torget	Email	30 November 2020		
Helthjem	Business Development and Innovation Manager, and Account Manager	Email	08 January 2021		
Helthjem	Account Manager	Email	11 January 2021		
Greenphones	Investor and advisor	Email	11 January 2021		
Bergans	Project Manager Circular Services	Email	14 January 2021		
Greenphones	Investor and advisor	Email	14 January 2021		
Finn.no	Product Director at Finn Torget	Email	14 January 2021		
Bergans	Project Manager Circular Services	Email	15 January 2021		
Finn.no	Product Director at Finn Torget	Interview	18 January 2021	01:00:00	2 researchers
Red Cross	CEO	Email	20 January 2021		
Bergans	Sustainability Manager	Interview	20 January 2021	01:15:00	2 researchers
Greenphones	Investor and advisor	Interview	20 January 2021	01:15:00	2 researchers
Red Cross	CEO	Interview	25 January 2021	00:30:00	2 researchers
Bergans	Project Manager Circular Services Answers to interview	Email	27 January 2021		
Helthjem	Business Development and Innovation Manager	Interview	02 February 2021	01:00:00	2 researchers

The interview guides were created based on relevant literature and are found attached in Appendix 1-2. To obtain as much relevant data as possible, the respondents were sent an email between two and three days in advance of the interviews with both an information letter and the interview guide. This action ensured that the respondents could be prepared and ask questions if they had any. The interview guides consisted of prepared questions and themes. The purpose with the interviews was to obtain knowledge about how the customers adopted CE strategies and how this can affect Helthjem's value chain as well as their own value chain. This included both knowledge, opinions and feelings from the respondents. To

help the respondents in the right direction, the questions were in between open and leading. The questions were also a mix between general and specific related to the topic (Merriam and Tisdell 2015). In addition to the interviews, this study also used secondary data collected through a literature review.

### **3.7.2 Literature Review**

Independent of research model, a literature review is useful and required to obtain secondary data. Secondary data is existing knowledge and building blocks of all academic activities (Saunders, Lewis, and Thornhill 2012, Snyder 2019). A literature review is in this thesis used to provide an overview of a research problem and create a research agenda. Because of the lack of knowledge of this research area, there would not be possible to evaluate theory evidence nor examining the validity of competing theories (Baumeister and Leary 1997, Torraco 2005, Tranfield, Denyer, and Smart 2003). The conduction of a literature review can be divided into three main groups, systematic, semi-systematic and integrative. The different types have differing approaches such as purpose; research questions; search strategy; sample characteristics; analysis and evaluation; and contribution. The systematic literature review is characterized by the purpose to synthesize and compare through a quantitative analysis. This gives specific RQs and results in evidence of effects. On the other side, integrative literature reviews have the purpose to critique and synthesize through a qualitative approach (Snyder 2019). The RQs are narrow and broad, and the literature is conducted from research articles, books and other published texts (Torraco 2005). The contribution is often theoretical model or framework, or classifications. The semi-systematic review is in between the systematic and integrative reviews (Snyder 2019).

This study's literature review leans towards an integrative literature review based on the qualitative approach. The RQs are broad, and there is a need for a knowledge base to review and expand the theoretical foundations of CE in the service industry. Today, this topic is emerging, and the purpose is to create theoretical frameworks and documentation for evidence. The literature review of this study is presented in Figure 3-6.

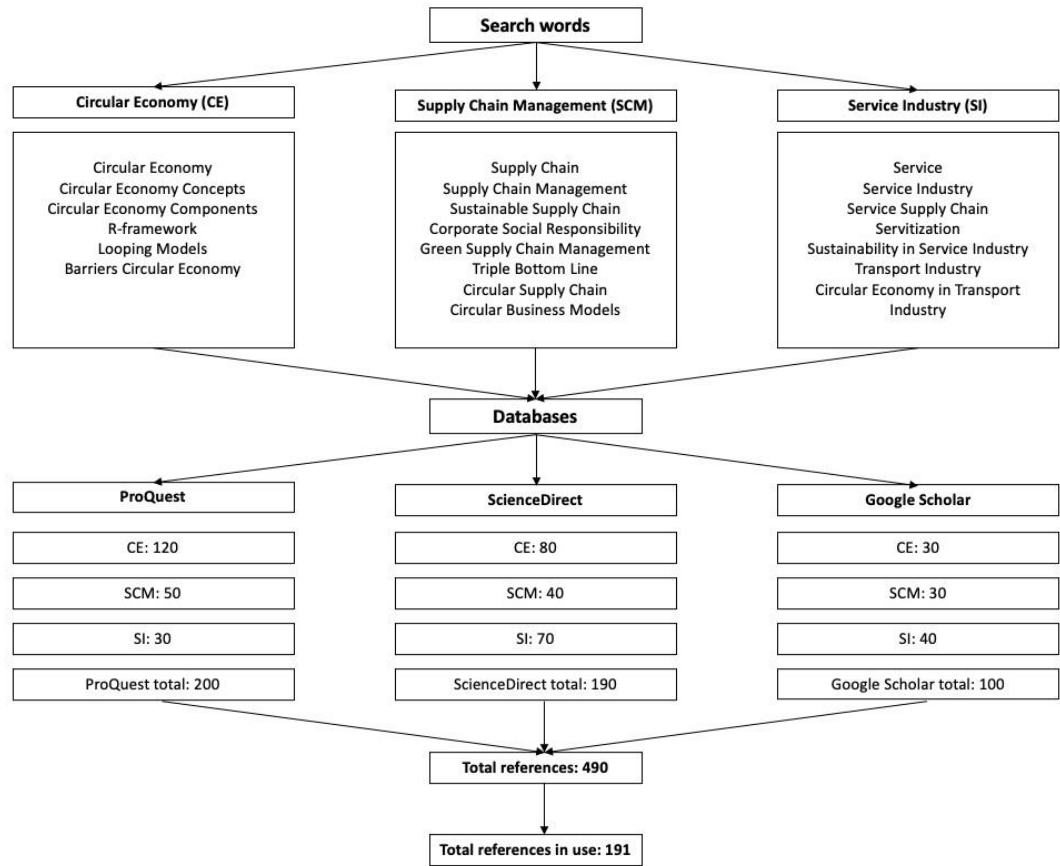


Figure 3-6 Overview of the Literature Review

The literature is obtained from research articles, books and other published texts through a database provided by the University College of Molde called Oria, where all students have free access. Through this database, we accessed three databases, ProQuest, ScienceDirect and Google Scholar. To review the literature, we started by exploring the area of CE in general with different search words, as illustrated in the figure. Further, this was repeated for the SCM and the service industry. In total, the most used databases were ProQuest and ScienceDirect. The total number of relevant references found were about 490, but in the end, the total number of references in use was 191. Next, an explanation of how the collected data were analyzed is given.

### 3.7.3 Data analysis

The gathered data needs to be analyzed to be useful and understood. The analysis of data depends on the type of data, either qualitative or quantitative. Analyzing qualitative data concerns developing theory from the data, in contrast to quantitative data where the purpose

is to categorize into groups to be able to analyze it in a meaningful way (Saunders, Lewis, and Thornhill 2007). As there exists different research approaches, as mentioned before, the data collection is also possible to have either a deductive or an inductive perspective. When using a deductive approach, you use existing theory to both the research process and to the data analysis. On the other hand, when using an inductive approach your goal is to build theory based on your gathered data (Yin 2003). In this exploratory study without theoretical framework, the used approach is inductive because the data were analyzed as it was collected (Saunders, Lewis, and Thornhill 2007).

The qualitative data can take different forms, both in written form such as emails and reports, and non-written form such as audio-recordings. In qualitative research when using interviews, it is recommended to record the audio and afterwards transcribe into actual words in a written document. After the transcription there is a need for a process called data cleaning, meaning correcting all errors from the transcription (Saunders, Lewis, and Thornhill 2007). In this study, the obtained data took both a written form such as email and transcription, and non-written as audio-recording. All interviews were recorded, with permission from the participants, to ensure that all data were included. The audio-recording ensured reliable data and control biases, as well as it made the researchers of the study more concentrated on the respondent instead of taking notes. The recordings were further transcribed in a written document right after the interview. The document included all the records in words and showed who said what.

In the same way as there exists different approaches to use, there are also different analytical strategies. These strategies are divided into two, deductively based analytical procedures and inductively based analytical procedures (Yin 2003). The deductive strategy includes pattern matching or explanation building. The analysis strategies for the inductive approach include a few more, data display and analysis; template analysis; analytical introduction; grounded theory; discourse analysis; and narrative analysis. Based on the approach for this study, the used strategies for analysis include data display and analysis, and analytic induction. *Data display and analysis* was distinguished into three subprocesses, data reduction, data display, and drawing and verifying conclusions. The first step included reducing the collected data to focus on the most important parts. The transcription was translated into English, and the most important parts were selected out. Afterwards, data display concerned structuring the

data in tables to make it easy to handle. The conclusions from all answers by the respondents were added into the table together with some direct quotes. Lastly, the display of data resulted in tables with who said what (persons), conclusions and direct quotes. This final table made it more convenient for comparison. *Analytic induction* included explaining the data and then testing it through the case studies to explore the phenomena. This strategy contributed to the goal of the study, to develop theory, by looking into the data in detail and then see this in the light of the case companies (Saunders, Lewis, and Thornhill 2007). To ensure valuable data and results from these methods, validity and reliability is important which is described in the next section.

### **3.8 Validity and Reliability**

The credibility of research findings will always be an issue when conducting studies. The influencing factors for this issue are many, such as trends, instruments and personal biases. The goal is to reduce the possibility of getting wrong answers, therefore, research design is essential (Saunders, Lewis, and Thornhill 2007). Rogers (1961), cited by Saunders, Lewis, and Thornhill (2007, 149) summarize this in an appropriate way: “*scientific methodology needs to be seen for what it truly is, a way of preventing me from deceiving myself in regard to my creatively formed subjective hunches which have developed out of the relationship between me and my material*”. With the focus on reducing the possibility of wrong answers as much as possible, there are two emphases on research design called validity and reliability.

Validity covers whether the findings in a study concerns what they were intended to (Saunders, Lewis, and Thornhill 2007). According to Yin (2018), validity can be distinguished into three types: construct, internal and external validity. Construct validity considers identifying correct operational measures for the studied concepts, for instance through including several sources of evidence such as documents, interviews, observations, and so on. The internal validity may also be called credibility and deals with the question of whether the research findings match the reality. As a qualitative researcher, a way to ensure internal validity is to collect data from several respondents. External validity answers the question of whether a study’s research can be generalized to other settings or groups (Merriam and Tisdell 2015). In this study, the collected data were based on specific concepts

from the literature and by using stated measures for circularity such as R-framework, it made it easier to compare this with other similar concepts. Several sources of information were also used, such as from documents in the literature review and through interviews. The data in the interviews were collected from several respondents, the service provider and their four customers, which ensured a higher probability of internal validity. In addition, the interviewed customers belong to different industries, and this variety in participants has increased the probability of this study's ability to be generalized to other settings. Still, it is recommended that the study should be replicated to be able to establish such generalizability (Saunders, Lewis, and Thornhill 2012).

Reliability concerns whether the data collection and analysis provide consistent findings, and if they would result in the same findings if they were repeated by another researcher. There are several threats to reliability such as errors and biases among both the participants and the researchers. Therefore, it is crucial that the work and data collection in this study is presented in a fully transparent way which will allow others to judge the findings for themselves and be able to replicate the study (Saunders, Lewis, and Thornhill 2012). This study ensures transparency by including all documentations, as the interview guides is included in the appendix. Additionally, the interview guides avoided leading questions and mainly consisted of two parts, general questions and CE related questions. A factor which might contribute to a reduced reliability is the translation from Norwegian to English when presenting the results, as four of the interviews were conducted in Norwegian.

### **3.9 Chapter Summary**

This chapter has presented relevant research methodology for this study to demonstrate credibility. The philosophy and design of the research has been discussed, as well as data analysis and methods for data collection. As explained in this methodology chapter, this is a qualitative study in the form of an exploratory multiple case study and the data were collected through semi-structured interviews. The next chapter will present the findings from this data collection.

## 4.0 Results

### 4.1 Chapter Introduction

The purpose of this chapter is to present the data and findings obtained from the semi-structured interviews with Helthjem and their four customers. First, what circular strategies Helthjem and the customers are practicing is presented through the R-framework. Second, results based on the customers' perspective on how these strategies might affect Helthjem is shown. Third, what challenges both Helthjem and their customers are facing in the transition from a linear to a CE are presented, while the fourth part summarizes how such challenges can be overcome.

### 4.2 The Adopted CE Strategies

Through the interviews conducted, this section seeks to answer RQ1, thus, *what CE strategies have the transport service providers and their customers already adopted and how they are utilizing them*. From the findings, both Helthjem and their customers all practice different CE strategies. Table 4-1 summarizes the adopted strategies by each customer according to the 3Rs in the R-framework. Further, which CE strategies the companies could imagine themselves adopting in the future have also been investigated. Additionally, an explanation of the strategies adopted by Helthjem to face the increasing demand for sustainable and circular services is also expounded on.

Table 4-1 Already Adopted CE Strategies

Company	Reduce	Reuse	Recycle
<b>Finn.no</b>	Reducing the number of new products in the market	Provides a platform for reuse A small focus on rent	
<b>Greenphones</b>	Reducing the number of new phones in the market	Reuse of phones Repair of phones Buy-back program	Recycling of phones and parts that cannot be reused
<b>Bergans</b>	Redesign Using durable and sustainable materials	Collecting and selling used clothes Repair services A small focus on rent	
<b>Red Cross</b>		Collecting and selling used clothes	
<b>Helthjem</b>	Using electric cars and bikes Delivery by foot in urban areas		

### 4.2.1 Reduce

Three of the interviewed customers practice the reduce principle in the R-framework: Finn.no, Greenphones and Bergans. Additionally, Helthjem had adopted certain strategies to utilize the reduce principle. How the different companies practice reduce is further elaborated in this section.

#### *Reducing the Number of New Products in the Market*

Finn.no's focus is on extending products' life cycle through providing a platform where consumers can sell, and purchase used products. They are constantly working on finding new solutions that will make it easier and more appealing for private consumers to buy used products, which facilitates for the reduce principle. This is because by offering a platform where reused products can be sold and bought, the number of new products entering the market each year is reduced. The amount of waste generated is also reduced, as consumers sell their used products to others instead of throwing them away as waste. Similarly, Greenphones practices the reduce principle by selling used mobile phones at their website and physical store. Through buying, repairing, and reselling used phones, the number of new phones entering the market each year is reduced, as well as the need for virgin materials to produce new products. Additionally, the amount of waste is reduced, because the phones sold to Greenphones would have ended up as waste if they were not resold. By offering their buy-back program, which encourages the consumers to sell their used phones back to Greenphones at the end of their lifetime, they are ensuring the utilization of materials to their fullest potential, thus reducing the negative environmental impact from producing new materials. According to the respondent, the consumers that sell their phones do not always buy a used phone in return. Therefore, Greenphones are constantly looking for new target groups who can contribute to reducing the number of new phones entering the market each year, as well as preventing used phones from becoming waste. An example of such a group is parents who want to buy cheap phones for their kids, as told by the respondent:

*We can take a C-grade telephone, like the worst telephone we have, you put a cover on it, and you refurbish the screen. The phone will look like new and it kind of looks cool for the kids – Greenphones*



### ***Durable and Sustainable Materials***

For Bergans, it is important to offer durable, high-quality products. This is done by carefully cooperating with their fabric suppliers, in order to ensure that the materials used in the production are of high quality and made of sustainable materials. This is explained by the respondent at Bergans:

*We use carefully selected fabrics. We want to ensure quality and functionality. Sustainability is important, so the materials can for instance be made from organic cotton or recycled polyester - Bergans*

By designing durable products, Bergans is practicing the reduce principle. This is because consumers need to buy less new materials, as the products bought from Bergans last for a longer time and do not break as easily as if they were produced with less durable materials. Also, by using sustainable materials such as recycled polyester, they are reducing the negative environmental impact from resource extraction of virgin materials.

Comparably, when discussing which circular strategies Greenphones might adopt in the future, two strategies concerning using durable and sustainable materials were mentioned. First, they want to sell environmentally friendly phone accessories, such as phone covers made of linseed. These types of green accessories are easy to recycle into new materials and is something Greenphones potentially could imagine themselves selling through their website in addition to the mobile phones. By doing so, they would reduce the need to extract virgin materials whenever buying new phone accessories. Second, the respondent argued that environmentally friendly packaging is something they imagine implementing. Greenphones also believed that a continued cooperation with Helthjem would be beneficial if they want to implement a zero-waste strategy in their packaging, and how this could be carried out is summarized by Greenphones:

*I would like to have a situation where we could deliver 10.000 environmentally friendly packaging to Helthjem, and this is kind of in the luxurious world where a Helthjem person would knock on the door and say 'Hi, I'm your Helthjem collector, may I have your phone?'. They would then drop it in the envelope, an environmentally friendly envelope, and then Helthjem would take it from there to the shop in Tvedestrand - Greenphones*

In fact, at the time of the interview, Greenphones was in the process of developing their packaging. They wanted to change their packaging to exclude plastics and paper that cannot be recycled, and rather be made of recycled or environmentally friendly materials. By doing so, the amount of waste generated from packaging is reduced, which was highlighted by the respondent at Greenphones as a large issue in today's world.

### ***Redesign***

Bergans explained that they are cooperating with influencers and students to redesign used products and sell them at their store in Oslo. By using a redesign strategy, they are reducing the negative environmental impact from resource extraction of virgin materials, as well as the amount of waste. However, as of now, redesign is not a profitable strategy and represent only a very small portion of their sold products. The respondent explained that it currently is considered as a fun activity which is used to promote Bergans' sustainability focus on social media.

### ***Electric Cars, Bikes, and Delivery by Foot***

Helthjem has adopted the reduce principle into their value chain by constantly trying to reduce their emissions. During the interview, Helthjem argued that working towards zero emissions is not a CE strategy alone, but in combination with other measures it is a contribution to the CE. When talking about their zero emissions strategy, they stated: "*This is all about reducing*". Helthjem's emissions are already quite low, and moving forward, the goal for Helthjem is to move an even larger portion of their fleet to be powered by alternative fuel options, such as electricity. Additionally, by delivering shipments at night Helthjem avoids driving in queues, which reduces emissions. Since Helthjem constantly is reducing their emissions, they also want to facilitate for their customers' circular strategies by visualizing and promoting how Helthjem easily can support circularity. For instance, Helthjem have played a crucial role in making used products sold at Finn.no available for consumers all over Norway. This contributes to the reduce principle, as they argued that the emissions generated per package shipped by Helthjem is quite low. Therefore, shipping packages to new areas in Norway through the Helthjem network reduces the negative environmental impact, compared to if each individual consumer had to drive to the store to buy the products that Helthjem can transport. This is elaborated by a statement from Helthjem:

*The package can travel large distances, but it travels in a network together with 2000 other packages. So, the additional emissions for that single package are reduced - Helthjem*

Furthermore, Helthjem offers integrated solutions, making it easy for their customers to start up CE projects. For instance, if Bergans started to sell used clothes on their website, Helthjem can start delivery and pick up everywhere in Norway right away. Helthjem also believes that offering good prices to their circular customers is important, as this area is new and might offer new experiences and knowledge which is useful for the future. Helthjem also does marketing and co-branding together with these circular customers, to enhance their visibility to the private consumers especially in terms of the simple, circular solutions they offer.

#### **4.2.2 Reuse**

During the interviews, it was made clear that all the customers practiced the reuse principle in the R-framework. This will be further explained in this section.

##### ***Second-Hand Sales***

All four customers explained that a part of their reuse strategy is to sell used products. As previously mentioned, Finn.no provides a platform where used products can be sold and bought. This is stated by the respondent by saying: *“Our focus is on prolonging products’ lifetime through facilitating for second-hand sales”*. Finn.no stated that reuse is a trend that is rapidly growing. However, Finn.no also explained that there are some barriers among consumers when it comes to buying used products. For instance, Finn.no has experienced that the consumers are more resistant to buying products if they cannot have a look at them in person before buying them, because they are skeptical as to whether the product is of high-quality as per ad’s description. By the same token, Greenphones explained that their main strategy is to sell used phones to consumers and companies through their website and physical store in Tvedestrand. Bergans also sells used products, and they are able to do so by collecting used clothes either at their stores or through collection-bags that consumers can send in the mail. To incentivize consumers to hand in their used clothes, they receive a discount coupon that offers them 20 percent off their next purchase at Bergans as a reward.

The used clothes that are donated to Bergans might be redesigned, repaired, cleaned and inspected before they are resold at their flagship store in Oslo. The respondent at Bergans explained that they are aiming at further developing this strategy, for instance by offering second-hand sales at their website as well. Also Red Cross collects and sells used clothes, but as opposed to Bergans, they sell the clothes to companies instead of private consumers. According to the respondent at Red Cross, their entire BM is based on reuse, as their CE strategy. Thus, their main goal is to eliminate the leakage of resources out of the system, and they believe that the companies that collect and resell used clothes play a crucial role in realizing this goal.

### ***Repair***

The customers that mentioned that they use repair as a CE strategy were Greenphones and Bergans. Typically, Greenphones can repair and resell the same phone three times before losing their quality. Additionally, Bergans explained that they offer repair services, and they are divided into three parts: a large sewing department in Asker, a smaller one in Oslo, and a sewing car that each year drives on a tour to different places in Norway. The sewing car has become quite popular and the respondent at Bergans believes that the reason is that it is easily accessible for consumers, as it travels to where they live (door-to-door). This is also a part of Bergans' strategy of offering durable products, as consumers are offered to repair their broken products instead of throwing them away. Furthermore, Bergans explained that they want to further develop their repair services, as they believe this represents a huge potential: *"To make the repair service even easier and accessible to the consumer is something we want to further develop"*.

Even though Finn.no does not practice a repair strategy today, they mentioned it as a strategy they might adopt in the future. In the past, Finn.no had a section at their website where private consumers could post adverts for small jobs they needed done. Still, the market was not large enough at that point in time, so the section was removed two years ago. Similarly, Red Cross were asked whether they might consider performing repair services in the future. Here, the respondent argued that the potential for this service is more appropriate for transport companies. This is because they have an established distribution system, which makes it easier to bring the product back and forth from the consumer.

## ***Rent***

Both Bergans and Finn.no offer rental services to their consumers. Bergans offer rental services of clothes and equipment at their stores in Oslo and Tromsø. Additionally, their rental services include the subscription service of kids' snowsuits in cooperation with Helthjem. The respondent at Bergans explained that they are aiming at offering both their regular rental services found at the two stores and the subscription service for kids' snowsuits at their website sometime in the future, but they do not yet know when. Finn.no explained that their rental services are limited to car trailers and some types of machines, "*We also have some rental services, but this is not yet something that we have a large focus on*". However, Finn.no mentioned that expanding their rental services might be a CE strategy they would adopt in the future and argued that B2C rental services have more potential than C2C rental services by saying:

*I believe that rental services from consumer to consumer are far away from succeeding as of now, but I think that from a professional company to a private consumer have a larger potential - Finn.no*

The reasoning behind this argument is based on the fact that companies have a better potential to arrange for insurance of the products and have well-established logistics. However, the respondent does not completely discard the idea of a C2C rental services in certain product groups, such as products with a high value because these products are more robust, of higher quality and suitable to last longer.

### **4.2.3 Recycle**

The only company that mentioned that they were practicing the recycle principle were Greenphones. Through the buy-back program, they acquire phones of different quality, where some of them are at their final life cycle. When the phones no longer can be reused, Greenphones ensures that they are responsibly recycled. This is done by disassembling the phones, keeping the parts that still can be used to repair other phones, and the rest is sent to a partner that is a recycling company. By doing so, the consumers are encouraged to sell their phones back to Greenphones, which then ensures that the materials are fully utilized until their final life cycle. Red Cross discussed recycling when asked which CE strategies they might adopt in the future. Currently, Red Cross focuses only on those products that can

be reused in the same form and with the same purpose that they were originally intended. However, Red Cross explained that they receive many donations of clothes that cannot be reused because they are dirty or ripped. Therefore, the respondent believed that there is a huge potential to find new solutions to also utilize these materials and that this might be found through cooperation with others, such as material recycling companies.

### 4.3 The Effect of the Adopted CE Strategies on Helthjem's SC

The purpose of this section is to answer RQ2 of how the adopted CE strategies are affecting the transport service providers' value chains. Hence, the customers were asked how they think their already adopted CE strategies and those strategies they might adopt in the future could affect Helthjem's SC. Their answers are summarized in Table 4-2 and is further explained in the next sections.

Table 4-2 How CE will Affect Helthjem's SC

Company	Summary
<b>Bergans</b>	Volume Growth Cooperation with Other Transport Companies Strengthening Their Brand
<b>Greenphones</b>	Volume Growth Partnerships to Create Pick Up Points Personalization Strengthening Their Brand
<b>Finn.no</b>	Volume Growth Cooperation with Other Transport Companies
<b>Red Cross</b>	Volume Growth Cooperation to Solve Environmental Challenges

#### *Cooperation and Partnerships*

All four customers mentioned that they believe Helthjem will need to cooperate and build stronger relationships in their SC due to the increasing number of CE strategies. Both Bergans and Red Cross mentioned Helthjem's potential to cooperate with other partners to improve and increase their number of services, and thereby offer a more complete personalized and environmentally friendly service for their customers. Bergans explained that they highly value communication with other actors in similar industries who also want to adopt CE strategies into their BMs, as they believe transparency is key to finding new sustainable solutions. Greenphones believed that the customer requirements eventually will push Helthjem to create partnerships with grocery stores, gas stations and kiosks to establish

pick up points. Similarly, Finn.no believed that CE strategies will push Helthjem to enter partnerships to be able to transport larger shipments. For instance, Bergans and Finn.no argued that tents for rent and reused furniture need a transport service provider that can transport larger packages. Moreover, Red Cross mentioned that transport of large packages is a challenge for Helthjem, because the infrastructure need to be restructured.

### ***Volume Growth***

Another aspect that affects the value chain of the case company is the volume. All customers stated that Helthjem's volume most likely will increase due to the CE. Red Cross pointed out that: *"It is all about using their return service to exploit the capacity that already exists"*. The more the Red Cross promotes their home-collection service to consumers, the more the volumes for Helthjem increases. The same goes for Bergans. Today, Bergans use Helthjem for their rental service of snowsuits but see a lot of opportunities to use them in their repair and reuse strategies as well, which will affect volumes of deliveries. Greenphones were also aiming at an increase in their volume, especially in the business market, which also will increase the number of deliveries for Helthjem. Similarly, as Finn.no sees an increase in the trend of purchasing used products, the volumes transported by Helthjem will also increase.

### ***Strengthening Their Brand***

Bergans and Greenphones believed that their cooperation with Helthjem will strengthen the brand of Helthjem. Bergans emphasized that their adopted CE strategies such as the subscription service for snowsuits will benefit Helthjem's brand. The respondent at Bergans explained that the consumers that participated in the first period of the pilot project were satisfied with the transport service offered by the Helthjem, which is beneficial for the transport service provider's reputation. Similarly, Greenphones believed that cooperating with customers offering CE services is something Helthjem could leverage to strengthen their reputation as a green transport service provider.

### ***Personalization***

Greenphones discussed that Helthjem should adopt more personalized services, as all their customers eventually will require different solutions to their various CE strategies. Greenphones had several ideas they would like to realize in cooperation with Helthjem, such as adopting a zero-waste strategy in their packaging, having personal delivery, and creating

secured pick-up and drop-off points for high-value products. However, at the time of the interview, Greenphones argued that Helthjem were not yet differentiating between their customers and offering personalized services at a high enough level. They explained that Helthjem have a similar customer relationship for all customers, with no special treatment. The respondent hoped that this would change in the future:

*They should get away from that mentality of ‘if we do it for them, we need to do it for everybody’. That is kind of a little bit of a Norwegian philosophy -*  
Greenphones

Additionally, the respondent at Greenphones believed that this need for personalization will require Helthjem to become even more environmentally friendly, even though this is a hard task in the transportation industry.

## 4.4 Challenges the Transport Service Providers Face

This section addresses RQ3, thus, *what challenges the transport service providers may face with a shift from a linear to a circular SC among their customers*. Both Helthjem and their customers were asked questions regarding this during their interviews. The first section elaborates the answers given by the customers, while the second section explains Helthjem’s answers.

### 4.4.1 Challenges from the Customers’ Point of View

Table 4-3 shows a summary of the responses of Helthjem’s customers.

*Table 4-3 Challenges from the Customer Point of View*

<b>Company</b>	<b>Challenges Helthjem may face with their customers’ CE transition</b>
<b>Bergans</b>	Customer Service Costs
<b>Greenphones</b>	Rapid Changes Brand Profiling
<b>Finn.no</b>	Coverage Efficiency and Predictability Customer Service Theft Environmental Challenges
<b>Red Cross</b>	Costs Customer Service



### ***Costs***

Both Bergans and Red Cross mentioned that they believe the costs of transitioning into a CE will be a challenge for Helthjem. The respondent at Bergans stated: *“The biggest challenge in relation to circular services is the huge costs for handling the logistics”*. Bergans further argued that the cost of logistics is high and hard to be profitable, as the CE concepts is still in an early stage. They exemplify this through the toll fee they need to pay for both the regular and the return flow. Since Bergans have their manufacturing and production facilities abroad, they face high costs because of these regulations. Additionally, they explained that they want to participate in the transition to a CE, but most of their circular solutions are not yet profitable and therefore they need to continue also selling new products. By the same token, Red Cross mentioned repair as an expensive service. Red Cross also argued that reuse of clothes requires large volumes to be profitable, which is challenging for Helthjem because of their capacity and infrastructure. Another reason is that the users expect the freight to be free, also for the home-deliveries. As pointed out by Bergans:

*The standard of people paying to get packages delivered on their doorstep need to be in place as soon as possible to make these services profitable - Bergans*

### ***Customer Service and Theft***

Customer service was pointed out as a concern for both Bergans and Finn.no. For Bergans this concerned the customer support and the ability to communicate with the consumer. Bergans emphasized that it is hard to establish a relationship between the consumer and Helthjem due to their deliveries at night. This is in line with Red Cross which argued that it is crucial with consumer contact when delivering unique products, such as when transporting repaired products. However, Red Cross explained that this is less important in the reuse market, such as with their home-collection service. Another issue in relation to the customer support is the safety aspect. Finn.no stated that: *“The threat of theft makes it difficult for Helthjem to send expensive products”*. As the packages are both delivered and collected from the consumers’ doorsteps, there is a risk for theft. This is a challenge if Helthjem’s customers need to transport high-value products.

### ***Rapid Changes***

Greenphones pointed out that Helthjem needs to be equipped for rapid changes in the market with the ability to make quick decisions and possess excess capacity and knowledge. This is

hard since they are owned by a large company such as Schibsted. The respondent at Greenphones further argued that it is easier with start-up companies, as it is easier to receive a more personalized service from them. If Helthjem wants to implement rapid changes, it typically comes all the way up to Schibsted as the owner to approve these changes, which might be a time-consuming process.

### ***Brand Profiling***

Greenphones heightened that they do not think Helthjem is leveraging their cooperation with green companies. Today several of their customers focus on circular solutions and sustainability, which should have been more profiled because this will strengthen their brand. Customers care about the environment, and therefore, this is an important piece to profile. Reading their interest in cooperating with Helthjem to adopt a zero-waste strategy in their packaging, the respondent argued:

*If they really wanted to focus on us and contribute into a zero-waste strategy, they should invest the money since this is not that much in total. From a market perspective, this is something they really could leverage for their own company*

- Greenphones

Furthermore, the respondent pointed out that when entering the website of Helthjem, it is difficult to find information regarding their strategy to help save the climate. By this reason, when people visit their website, it seems like they do not focus on CE. If the information regarding their strategies was clear, it may be more attractive for other green companies to cooperate with Helthjem and thereby contribute to more circular services. Therefore, the respondent believed that brand profiling was a challenge for Helthjem.

### ***Coverage, Efficiency and Predictability***

Finn.no believed that being able to cover every household all over Norway will be a challenge for Helthjem. The respondent related this to the challenges concerning efficiency and predictability. Thus, Finn.no argued that the time it takes to transport a product to the consumers has a large variation depending on where in Norway they are located which decreases their predictability. They are hoping that this will improve in the future to increase the accessibility to circular services for all consumers in Norway but believes that this will be a challenge for Helthjem.

### ***Environmental Challenges***

Even though the respondent at Finn.no wants Helthjem to increase their coverage, it is pointed out that this might bring some environmental challenges. As the accessibility to consumption is increased, so does the environmental impact. As stated by the respondent: *“All parts concerning consume such as transport and buying new product is a challenge for the environment”*. Additionally, by making it easier for consumers to return their products, they may purchase and return even more products, thereby doubling the environmental impact from the transport process.

#### **4.4.2 Challenges from Helthjem’s Point of View**

This section presents the challenges Helthjem may face due to their customers’ transition into a CE.

### ***Unique Products***

Helthjem stated that possibly the biggest challenge with CE strategies is that they will be transporting more unique products. This was further explained by Helthjem: *“There is only one dress that is being rented. If it is lost, it is hard to solve that customer challenge”*. This challenge is prominent in the second-hand market as opposed to new products. For example, if a consumer buys a new shirt and it gets lost during transportation, the company will be able to send them a new one. However, this is not the case with second-hand products. For instance, if a child is inheriting a sweater from their grandmother, this sweater represents an emotional value, not just an economic value as a new product would. If this sweater gets lost during transportation, then Helthjem faces a challenge they cannot solve. With such cases, the customer’s trust in Helthjem will most likely decrease, and these stories tend to spread quickly.

### ***Valuable Products***

Another challenge mentioned by Helthjem is that the circular products sometimes are of higher economic value. As of now, Helthjem does not have any measures to avoid theft of packages left at consumers’ doorsteps. Therefore, they cannot transport goods with a higher value than about 10.000 NOK. This was mentioned as a challenge and limitation by Helthjem because the circular products require a different design. To prolong the life cycle

of the products, these products are made of high-quality materials which sometimes makes them more expensive.

### ***Infrastructure***

Helthjem argued that their infrastructure could be a limitation and a challenge, as it is only appropriate for small and medium sized shipments, and therefore bigger packages are impossible to transport. The respondent uses rental services of tents as an example to illustrate this challenge:

*As an example – Tents. A very attractive category for rental services, as they are used for a short period at a relatively high price. They are also something you plan to use well in advance, so you book them a couple of weeks before you are using it. The challenge for us today is that they will not go through our sorting facilities, so we cannot sort the tents to our routes - Helthjem*

### ***Time of Delivery***

Since Helthjem delivers shipments by night, they are limited to a specific group of products where the customer does not have to be home to receive the package. For example, if the customer has ordered a washing machine, the customer need to be home to receive this and check that the product is in shape. These types of products are typically delivered by larger transport service providers such as Posten and PostNord and does not fit with Helthjem's current network.

### ***Customer Service and Documentation***

Customer service was mentioned by Helthjem to be a challenge, as the carriers do not have to be in contact with the consumers at all. On one side, this is a huge advantage as the deliveries will be conducted without any interruptions. Helthjem mentioned that this has especially been beneficial during the Covid-19 pandemic. On the other side, since there is no direct communication between the consumer and the carrier, the consumer has no idea what has happened during the delivery or pick up. If a deviation has happened during the deliveries at night, the consumer will typically call the customer support center during the day. Here, Helthjem explained the problem, by saying:

*The customer calls us at noon. At that point the carrier is sleeping, and we can only use the information that is found in the system – Helthjem*

Helthjem explained that this raises the issue of documentation, as they depends on well-documented deliveries and pick-ups to answer any of the consumers' queries. The respondent explained that they are constantly trying to improve their data tracking and that they are aware that some of their competitors are using more developed technology such as Radio Frequency Identification (RFID). RFID is a method to store and collect data through small devices called RFID-chips. Furthermore, the main challenge regarding documentation for Helthjem is if a deviation happens, such as if the carrier delivers the shipment to the wrong doorstep or forgets to pick up a package. This affects Helthjem's quality, as the documentation found in their system has an error. Additionally, the customer will not know where their package is in the system. Moreover, Helthjem stated that some of their competitors are years ahead of them when it comes to the use of technology for documentation and tracking of data. This means they have a competitive advantage against Helthjem, which makes it easier for them with transparency and trust in their systems.

### ***Coverage***

Helthjem explained that they want more customers and users, which means they need to cover more areas. This is challenging because of the infrastructure in Norway and is both time consuming and expensive. For example, in the northern part of Norway, there is a difficult and advanced route network which implies delays and a long delivery time. The delivery times range from two days to one week, and in the northern of Norway it is often against a week. The customer outside urban areas have lower requirements for delivery times, but to attract more customers the delivery times should be more efficient and accurate. In addition, the case company wants to increase their return services. Their network and carriers are already on the road, the next step is to increase the returns. Helthjem stated that:

*Most returns today happens when a customer drives his own car to a store and delivers the package there – Helthjem*

According to Helthjem, they are working towards having more customers using their return services instead of their own because this is both more convenient and environmentally friendly. During the interview, they stated that about 30 percent of returned shipments comes from the central part of Oslo where consumers can walk to return their packages. This means that 70 percent of the packages are returned by using cars. This represents huge potential to reduce the total impact on the environment.

### ***Predictability and Accuracy***

Helthjem asserted that rental services might lead to challenges regarding predictability and accuracy. The possibility for delays is high, and this is a threat both for Helthjem and their customers. Helthjem explained that CE strategies require them to have a well-established SC, which includes quality, high traceability, a continuous information flow, theft security and decreased deviations. This was exemplified by Helthjem by discussing the transport distance between Oslo and Bergen:

*On this route, delays often occur because of the road infrastructure, which can result in delays between one day to a week – Helthjem*

Thus, this therefore represents challenges, especially for the rental services. The renting strategy entails that the product should be sent to the customer, and within a time frame it should be picked up and delivered back. In these cases, it is unacceptable with delays.

### ***Finding the Right Timing***

Helthjem pointed out the struggle to find the right time to do investment and figuring out what they should invest in. Their customers are implementing different CE strategies, which is unpredictable. Some of the customers, such as Bergans, believes that rent will increase in the future, while Finn.no is unsure. Additionally, the society and market fluctuate constantly. The respondent explained that they aim to be a forward-thinking player that is the first to make important investments, but this also brings risk. By this reason, Helthjem finds it really challenging to know when to do investments.

## **4.5 Overcoming the Challenges**

To answer RQ4 of how the transport service providers can overcome such challenges, both the customers and Helthjem were asked how they believe Helthjem can overcome their challenges related to the transition into a CE, and their answers are presented in the subsequent sections.

### **4.5.1 Overcoming Challenges from the Customers' Point of View**

Table 4-4 shows a summary of the responses of Helthjem's customers.

Table 4-4 How the Customers can Help Helthjem to be More Circular

Company	Summary
<b>Bergans</b>	Increase Volumes
<b>Greenphones</b>	Try to Make an Impact Keeping Helthjem Updated and Involved
<b>Finn.no</b>	Offer Environmentally Friendly Solutions Offer Simple Solutions
<b>Red Cross</b>	Product Development Positioning their Brand

Bergans stated: *“The biggest challenges we have regarding circular services is that it is very expensive to handle the logistics”*. The respondent further elaborated that to continue these circular projects, they need to become profitable. It is believed that to make this profitable, the volumes need to increase. Therefore, Bergans argued that their contribution to helping Helthjem is to continuously try to increase their volumes. When asked how Greenphones may help Helthjem overcome the challenges, they stated: *“I think it all comes down to the impact we make”*. Greenphones further elaborated this by explaining that if they get their message out to a lot of people, it is easier to have influence. This means that Greenphones will have the power to influence consumers to choose their green solutions. Furthermore, the respondent believed that they need to keep Helthjem updated and involve them in their plans and ideas as they stated: *“It all comes down to that classical relationship building ideology”*.

The respondent at Finn.no believed that continuing to offer environmentally friendly solutions in cooperation with Helthjem is a way of helping them. It was explained that they want to offer more environmentally friendly solutions, as well as increase their volume in a sustainable way. Furthermore, Finn.no need to encourage the consumers to select these solutions, through presenting them as simple choices. Red Cross stated: *“I believe that it is through product development we can help them the most”*. By this token, Red Cross argued that they already are helping Helthjem through cooperating to develop the home-collection service. Throughout that process, Helthjem have learned important lessons for the future about their limitations when it comes to these types of services. Furthermore, Red Cross also believed that Helthjem need help positioning their brand. Here, allowing them to associate themselves with a strong brand such as Red Cross is beneficial for Helthjem.

## 4.5.2 Overcoming Challenges from Helthjem's Point of View

During the interview with Helthjem, several solutions to overcome the challenges in the shift from a linear economy to a circular was discussed. The next sections elaborate this.

### *Insurance*

An important mitigation strategy to face the challenges is, according to Helthjem, the use of better insurance. The respondent explained that they already are using an insurance that covers higher values than a standard insurance, and they are also insuring the packages both before picking up and after delivery to the doorsteps. Still, Helthjem emphasized that this only covers the challenges of the economic value. The sentimental value, however, is impossible to cover if the package is lost.

### *Cooperation*

Helthjem stated that the challenges related to large packages could be solved through cooperation. They said: *"We have alliances to handle larger packages, but this is not where our main focus is at"*. In addition, it was added: *"It is not a goal in itself for us to handle all categories of goods"*. Therefore, Helthjem have chosen to focus on small to medium packages and the rest are handled by partnerships. Cooperation was also mentioned as a solution when discussing the issue of delivering high-value products. Helthjem mentioned that it is possible to establish a network of delivery lockers which will keep the products safe, but this is something they want to do in cooperation with other transport service providers. Moreover, Helthjem has been working on introducing pick up locations in their network. These locations were planned to be established in cooperation with grocery stores, so consumers can pick up their shipments there.

### *Tracking and Documentation*

According to Helthjem, a strategy to reduce the risk of losing shipments is better tracking and documentation. Better tracking will according to Helthjem offer the consumers predictability, which hopefully makes the customers more satisfied and builds trust to their brand. For instance, for rent as a strategy, the respondent highlighted an important aspect:

*The predictability to know that you have the package tomorrow is important. If not, they need to add buffer-times. The more time spent on this, the less time for rent. – Helthjem*



Helthjem explained that better documentation will help them discover where and what happened in the event of a deviation. This will help them reduce and improve the mistakes. With more documentation and tracking points, it will be more beneficial and easier for the customers of Helthjem to implement CE strategies such as renting. For example, if one of the customers of the case company have rented out a dress for the weekend and they get the information that this return will be delayed with one day, they have the opportunity to inform the consumer and reschedule the original plan. They can mitigate against unforeseen events.

### ***Building Relationships with Customers***

Helthjem believes that building close relationships with their customers is key. The respondent stated that testing different concepts with their customers is essential to achieve success. By using this strategy, both parties can learn and contribute to more efficient solutions, and this is some of the reasons as to why Helthjem offers good prices to their circular customers. In addition, Helthjem have no requirements for the volumes the circular customers must provide, which lowers the threshold for cooperation. The respondent explained that many of Helthjem's circular customers are not yet profitable, but they believe that this strategy will be profitable in the long run. An example of how relationship building helps Helthjem to test new solutions and thereby learn by their mistakes is their cooperation with Red Cross to establish the home-collection service. As stated by Helthjem:

*We have already made some discoveries. For example, with Red Cross we have seen that the value of the products is so low that it is impossible to make a profit. It is impossible to run the project and be profitable. Or, saying that it is impossible is a bit harsh, but it is not a favorable business case. This is an example of a lesson we learned, where we see that the value of the products should be at least a couple of hundred NOK for us to do it - Helthjem*

Moreover, Helthjem argued that cooperating with their customers helps both parties to strengthen their brand. The respondent exemplified this by mentioning Finn.no, which presents Helthjem as a beneficial option to choose on their online platform.

### ***Environmental Impact***

The environmental footprint is a concern both for several customers and Helthjem themselves. Helthjem explained that they are continuously working towards achieving a

zero-emissions strategy. The respondent explained that wanting to cover every household in Norway might be conflicting with their zero-emission's goal, as it requires more energy to drive even further. Therefore, it is crucial for Helthjem to develop better established routes, but at the same time ensure that this is done in an environmentally friendly way. As an example, the respondent emphasized that they continuously are working on moving larger portions of their fleet onto alternative fuels, such as electricity. Electric cars are beneficial to transition into a CE and these cars, especially in Oslo, seem to be well-functioning.

### ***Adopting New Services***

The respondent at Helthjem believed that looking into performance of new services for the customers might be a solution to some of the challenges. Helthjem exemplified this by mentioning all the activities that happen after a circular product is collected from a private consumer:

*Basically, all reused products require a form of treatment. It can be washing, cleaning, repair, or another type of treatment before it is transported to the next consumer. These are examples of services we do not perform today, but that Bergans does themselves. This is something we could see ourselves doing in the future at a centralized location, a sewing location that can do repair – for instance, both mobile phones and Bergans' clothes at the same location will provide economies of scale - Helthjem*

Still, the respondent argued that this probably would have to be done in cooperation with other companies. This is because there are only a few companies in Norway that are big enough to have the potential to own the entire value chain by themselves.

## **4.6 Chapter Summary**

This chapter presented the findings from the interviews conducted with Helthjem and four of their customers, Finn.no, Greenphones, Bergans and Red Cross. The result shows that each customer and Helthjem practices different CE strategies, and the customers' perception of how Helthjem's SC are affected by these strategies were presented. Moreover, both the customers and Helthjem explained what challenges they believe Helthjem are facing and what they can do to overcome them. The subsequent chapter is an extension of this chapter, as it discusses the presented findings while taking into consideration the literature review.

## 5.0 Discussion

### 5.1 Chapter Introduction

The prior chapter has presented our findings based on the study's research problem whose aim is to investigate how CE strategies can affect the service value chain. These findings are in this chapter discussed against the theory presented in the literature review. The basis for this analysis is the RQs presented in the introduction chapter and consists of four main parts. First, a discussion on which CE strategies the customers and Helthjem are practicing is given, while the second section investigates how these strategies are affecting Helthjem's SC. The third part analyzes the challenges in the shift from a linear to a CE in the service sector. Finally, an analysis of how Helthjem can overcome these challenges is presented.

### 5.2 The Adopted Strategies

This section discusses results pertaining to RQ1 of *what CE strategies the transport service providers and their customers already have adopted, and how they are utilizing them*. This is discussed according to the 3Rs: reduce, reuse and recycle.

#### **Reduce**

Reduce is the most efficient of the 3Rs to achieve the CE objectives and contributes to smarter product use and manufacture (Kirchherr, Reike, and Hekkert 2017, Potting et al. 2017). Based on this fact, adopting the reduce principle into companies' BMs is an efficient strategy and a beneficial starting point to become more circular for all case companies. As the findings show, the companies practice the reduce principle in different ways. For example, Finn.no shows that they are practicing reduce by stating that they want to find new solutions that makes it easier and more appealing for consumers to buy used products. This complies with the reduce principle presented in the literature review, where reduction concerns improving efficiency through minimizing the use of resources and may be accomplished by for instance incentivizing a simpler lifestyle (Ghisellini, Cialani, and Ulgiati 2016, Su et al. 2013). By the same token, offering easy access to used products reduces the amount of waste, as the consumers probably would throw the products away as

waste if they did not have the option to sell it either through Finn.no's platform or through the buy-back program offered by Greenphones. Furthermore, facilitating for reduced waste is a step in the direction of achieving the first fundamental characteristic of the CE, that waste is designed out of the system (Ellen MacArthur Foundation 2015).

As shown in the result, Bergans also reduces the amount of waste and raw materials in use by utilizing durable and sustainable materials in their production process. Durable products might lead to less waste, as their life cycle lasts longer. This also means that consumers buy less new outdoor clothes, which reduces the number of new materials entering the market each year. Additionally, by using recycled materials and redesign already existing products, the need for new materials in the production process is reduced. This complies with the reduce principle, as its goal is to reduce the use of resources (Ghisellini, Cialani, and Ulgiati 2016). Also, by offering repair services to consumers, they ensure that the products' life cycles are prolonged (Ellen MacArthur Foundation 2013).

To fully utilize the reduce principle, there is a need to think in systems (Ghisellini, Cialani, and Ulgiati 2016). This means that the reduce strategy must be utilized in every stage (van der Valk 2015). For example, Greenphones could see themselves starting to sell environmentally friendly accessories and to use sustainable packaging. Here, they are aiming to adopt reduce into several stages of their SC, which implies system thinking. When discussing which type of accessories they might sell, the respondent mentioned phone covers made of linseed. By offering products made of linseed, Greenphones would contribute to having products cycled through the biological cycle, as linseed is compostable and can be safely returned to the natural environment (Braungart and McDonough 2002). Moreover, their goal to use sustainable packaging and adopt a zero-waste strategy is similar to the literature presented by DHL (2016), where they used zero-waste packaging as an action to transition into CE. Both Greenphones and DHL (2016) describe a strategy where products get delivered in reusable boxes or envelopes. Adopting these strategies means that Greenphones would broaden their use of the reduce principle, thus lowering the negative environmental impact (Ghisellini, Cialani, and Ulgiati 2016). Once again, this complies with the first fundamental characteristic of the CE, that waste is designed out of the system (Ellen MacArthur Foundation 2015).

Our findings further indicate that the transport service provider practice the reduce principle in the R-framework differently from their customers by constantly trying to reduce their emissions. As shown in the literature review, reduction may be achieved by minimizing the use of resources such as energy (Ghisellini, Cialani, and Ulgiati 2016), which is what Helthjem is doing by using electric cars and having their carriers deliver shipments by foot in central Oslo. This matches the third fundamental characteristic of CE, which is that renewable sources need to be used to create energy (Ellen MacArthur Foundation 2015). Even though Helthjem stated that their emissions already are quite low, they still have the potential to reduce them even more and completely achieve this fundamental characteristic of CE. Furthermore, their use of an electric truck fleet fits with the recommendations made by Techane (2020), who argues that vehicles running on alternative energy sources is the preferred choice in order to reduce the negative environmental impact from urban freight LML. As renewable sources of energy should be used in a CE, the customers that practice CE strategies most likely would prefer to use a transport service provider that can offer them low emissions.

To enhance the CE, Helthjem want to facilitate for circular solutions among their customers. This is done by visualizing and promoting to their customers how Helthjem can support their CE concepts. This reveals that the fourth fundamental characteristic of CE is evident, which is that CE needs to be thought of in systems. In order to do so, all systems should be designed to simplify the resource exchange among the different components (Ghisellini, Cialani, and Ulgiati 2016), and it can be argued that transportation is key in order to achieve simple solutions for resource exchange. For instance, Helthjem has made it even easier for consumers to donate used clothes to Red Cross through the home-collection service and they have facilitated for an easily accessible rental service of snowsuits for Bergans. Here, Helthjem have facilitated for the reuse principle and made it even more accessible and simpler for both their customers and the consumers. This shows that a transport service provider is an important actor in the system when developing a CE and have the possibility to contribute to reducing the negative environmental impact.

## **Reuse**

The findings suggest that all four customers are practicing the reuse strategy, which is the second most efficient way to achieve the CE objectives according to the R-framework (Kirchherr, Reike, and Hekkert 2017, Potting et al. 2017). A possible explanation to why all

customers practice this strategy is the close connection between reuse and CE, as an important difference between linear and circular BMs is the closed loop and removal of waste (Ellen MacArthur Foundation 2012). Precisely, the findings indicate that Finn.no is interested in prolonging products' lifetime by providing a platform where consumers can sell and purchase used products. This matches the definition of the second R in the R-framework, reuse: *“any operation which products or components that are not waste are used again for the same purpose for which they were conceived”* (EU 2008, 10). Therefore, it is evident that Finn.no practices the reuse strategy by facilitating for materials to be kept in the technical cycle, as reuse is mentioned as a strategy to keep materials within this cycle (Braungart and McDonough 2002).

A discovered issue in the findings regarding Finn.no's reuse model is that they cannot control what happens to the products after they have been sold through the website. This means, it is up to the consumers to decide whether they want to resell the products again, recycle them, or just throw them away as non-recyclable waste (Ellen MacArthur Foundation 2015, Ghisellini, Cialani, and Ulgiati 2016). This differs from Greenphones' reuse strategy, who through the buy-back program ensures that they remain the ownership of the phones at the end of their life cycles. It was explained by Greenphones that they usually can repair and resell the same phone three times, which means that the phones cycle through the technical cycle at least three times. This complies with the literature by Prendeville and Sherry (2014), who argue that incentivizing take-back schemes is a strategy to facilitate for reuse. Bergans also follows this recommendation by offering customers that donates used clothes a discount coupon.

In contrast, Red Cross is the only customer that practices reuse as their only CE strategy. Even though the clothes collected by Red Cross are not sold through their own stores, they are still facilitating for the sale of used clothes in thrift stores in other countries than Norway. This is in accordance with the fourth fundamental characteristic of the CE that it needs to be thought of in systems. The main element of this characteristic is that the CE is a holistic concept where resource exchange should be simplified among the different components (Ghisellini, Cialani, and Ulgiati 2016). The clothes donated in Norway might be considered as waste by the consumers that donate them, but when Red Cross sells them to thrift stores in other countries, they are given a new life cycle.

Even though second-hand sales often are portrayed as solely a positive measure to decrease the negative environmental impact, Finn.no argued during their interview that there are two sides to this. As already explained, the positive impact of Finn.no's platform is that they provide consumers with the option to sell their products instead of throwing them away. Still, this might also lead to increased consumption of resources for certain groups. For instance, some might see the opportunity to resell their used products as a way to ease their conscience and as a justification to why they should buy something new. This is conflicting with the literature presented by Castellani, Sala, and Mirabella (2015), where they present the reuse principle as only something positive for the environment. Similarly, Red Cross mentioned that about 35.000 tons of clothes are collected in Norway each year, while about 80.000 tons are consumed. This means that there is a significant gap. Nevertheless, consumers would likely still prefer to purchase new clothes, and throw their old ones away as non-recyclable waste. Therefore, Red Cross' service at least makes sure that these materials are reused and receive a new life cycle in another country, instead of being incinerated in Norway. By thinking of the CE as a holistic system (Ghisellini, Cialani, and Ulgiati 2016), where everything is linked together, this reduces the total number of raw materials used to produce new clothes, but it does not necessarily decrease the yearly consumption in the Norwegian market.

Other challenges described by Finn.no include that consumers mainly prefer to purchase expensive products and that they are skeptical to whether the ads describe the quality of the products correctly. This corresponds to some of the challenges described by Prendeville and Sherry (2014), who argue that the market demand for reused products is poor due to the consumers' perception of these products and their quality. Still, Finn.no explained that the trend of buying used products is growing and that second-hand shopping has become more accepted among consumers. Therefore, the argument made by Prendeville and Sherry (2014) saying that the market demand for reused products is poor does not comply with the statement made by Finn.no. Our findings indicate that Bergans are facing the challenges mentioned by Finn.no by offering rent and repair services. Both rent and repair services are mentioned by Besch (2005) as strategies to facilitate for the reuse principle. By offering rental services, Bergans ensures that they remain the ownership of the materials, and they wash and repair them between each user to guarantee that they are of good quality. The same goes for the sale of used products, they are all washed, repaired and sometimes redesigned

before sold at their store. By doing so, Bergans are overcoming the challenge mentioned by Prendeville and Sherry (2014), which is that consumers often perceive used products to be of poor quality. Most likely, consumers become less skeptical to buy a used product when it is sold by a professional actor they trust. This also concerns the repair strategy offered by Greenphones, where the phones are inspected, repaired and refurbished at their workshop before sold to consumers and other companies through their website.

During the interview with Bergans, it was explained that they believe repair services to be beneficial and something they want to investigate more in the future to expand their reuse focus. As an example, they explained that their sewing car has become very popular when it drives on tours to different places in Norway to repair products. It therefore makes sense that Bergans are aiming at further developing their repair services, as they have seen that accessibility is key in having consumers repairing their clothes instead of buying new ones. This might motivate the consumers to purchase both used and new products from Bergans, because they know that they easily can have them repaired if they are damaged.

### **Recycle**

Greenphones was the only company saying that they are practicing the recycle principle. Whether the materials are downcycled or upcycled when being shipped to their anonymized recycling partner is not mentioned. As argued by the Ellen MacArthur Foundation (2012), downcycling is the most common use of recycling today. However, by investigating the web page of Greenphones' recycling partner, they are stating that they each year receive iron, metals, paper, wood, plastics and oil that they upcycle into new raw materials, sell to manufacturers all over the world, which then use these raw materials to produce new products. If this is the case with the materials shipped from Greenphones, their products are upcycled, and they are contributing to keeping materials in the technical cycle (Braungart and McDonough 2002).

Red Cross also discussed the issues regarding downcycling of materials. As explained by the Ellen MacArthur Foundation (2012), downcycling is when products are converted into materials of poorer quality, and this is the dominant recycling strategy in the world today. Red Cross sees the potential for finding new solutions to upcycle the materials instead, which would facilitate for a more circular society. They believe that cooperation with



material recycling companies is a way to find these solutions, which complies with the second fundamental characteristic of the CE that resilience is built through diversity. Here, the main attribute is that the CE need a balance of different businesses of various sizes to survive (Ellen MacArthur Foundation 2015, Ulanowicz et al. 2009). By establishing cooperation between different companies, such as Red Cross and material recycling companies, new circular solutions might be found and contribute to the CE thriving.

### **5.3 The Effect of the Adopted CE Strategies on Helthjem's SC**

With the discussion from the previous section in mind, this section aims to answer RQ2, *how these adopted CE strategies are affecting the transport service providers' value chains*. The SC can be affected in different ways which is further discussed in this section. All actors in a SC are linked together. According to Christopher (1992), the definition of a SC is related to the network of all the participating organizations, where producing and delivering a service to the customer includes both the upstream and downstream flow. This indicate that if one of the actors in the network changes their strategy, it will affect the rest in the network as well. This is also the case when designing a CE. As presented in the literature review, the fourth fundamental characteristic of the CE is that it needs to be thought of in systems. This means that all actors in the system are linked closely together and will therefore be affected by each other's actions (Ghisellini, Cialani, and Ulgiati 2016). This indicate that when Helthjem's customers are changing their BM to include more CE strategies, it most likely will affect Helthjem's SC and BM. According to Planing (2015), BMI is an important building block in the transition to a CE. Still, to realize how Helthjem is affected, it is important to know how the different actors design their SC.

The interviewed customers and Helthjem all have different designed SCs. Finn.no and Helthjem have a typical SOSC, as they both offer a service as the output for the customer and no physical products. Finn.no offers a platform for reuse, while Helthjem offers a transport service. Red Cross' SC may be categorized as a PSSC (Wang et al. 2015). They offer both products and services, but to different customers. The donation bins and home-collection service are services offered to private consumers, and the donated clothes are then sold as products to international customers. Greenphones and Bergans also have a typical PSSC because they have a combination of services and products (Wang et al. 2015). Their

SCs have increased the number of added services through servitization where they offer the customer a mix of tangible products and intangible services. By offering the buy-back program, Greenphones retains the ownership of the products at the end of their lifetime, and add services such as maintenance and repair to prolong the life of the mobile phone (De Angelis, Howard, and Miemczyk 2018, Tukker and Tischner 2006). This also concerns Bergans, who offer rental services of kids' snowsuits.

The customers' SCs can most likely affect Helthjem. For instance, volume growth was mentioned by all customers as a likely consequence of their transition into a CE. How this volume growth emerges may be illustrated by considering the benefits a PSSC offers the consumers, and how this again could affect Helthjem's volumes. The integration between products and services has three prominent benefits (Rogelio and Robert 2003):

(1) Designing products with long life cycles might provide *economic benefits* as it often provides a higher revenue. This is because products with long life cycles typically require additional services, such as maintenance and repair, and services have an overall higher profit margin than products (Anderson, Fornell, and Rust 1997). For instance, as Bergans are designing long-lasting products with high-quality materials, they also offer services such as repair to prolong the lifetime even more. This might affect Helthjem by leading to a volume growth, because more products need these services.

(2) *The increased demand for services* that occur is also a benefit offered by PSSCs. For example, the fact that Bergans produces more robust and sustainable products by using high-quality materials makes the products more complex and expensive. This increases the demand of additional services by private consumers to ensure the right performance of the products, such as maintenance (Kumar, Markeset, and Kumar 2004). Also, when products become more expensive, the consumers' willingness to pay for repair services probably increase, as it is too expensive to throw the products away and buy new ones if they break. Furthermore, rented products often need services such as inspection, maintenance, and repair between each rental period. This may affect the SC of Helthjem by needing to transport more products that require such services.

(3) Finally, the last benefit of PSSC is *competitive advantage*. This is based on the fact that services often are more challenging to imitate by competitors than products (Sasser, Schlesinger, and Heskett 1997). When the customer implements services that are difficult to imitate, this increases the requirements for customization and uncertainty of Helthjem's SC,

as they need to be able to adapt to the change in demand for transportation it might cause. This change in demand might result in increased volumes in their SC.

To fully utilize these benefits with a PSSC, cooperation and partnerships might be beneficial. The findings show that all four customers believe that Helthjem need to create new and appropriate partnerships to be able to improve their services. For instance, Greenphones mentioned that Helthjem needed to enter partnerships with grocery stores, gas stations and kiosks to establish pick up points. This is in accordance with the literature presented from Haihong and Nan (2010), which states that a key to deliver appropriate services to the customers in the service SC are to select capable service providers to perform the services. By selecting appropriate partnerships, Helthjem may be able to meet their customers' demands. In order to be able to make the right decisions it is increasingly important for Helthjem to know their customers. Direct and frequent contact will make Helthjem more prepared for the future and the probability to succeed is higher. For example, the customers' thoughts about trends are important insights, as it indicates what will influence their BMs the coming years. To establish important partnerships and capture the customers, Greenphones argued that Helthjem also needs to adopt more personalized services, as their different customers will require different services corresponding to their adopted CE strategies. According to Cho et al. (2012), service performance is key in achieving efficiency in the service SC. Therefore, to achieve efficiency Helthjem needs to perform their service according to their customers' requirements.

By the same token, Finn.no believed that Helthjem will need to enter partnerships to be able to transport larger shipments. This means that the SC of Helthjem need to change into an integrated approach, where they cooperate with capable service providers to perform the demanded service (Sakhuja and Jain 2012). This means that Helthjem can outsource this function, which according to Chopra and Meindl (2016) is beneficial if the third-party can increase the surplus in the SC without causing a significant risk. Discussing the fact that Helthjem should enter partnerships also raises the issue of operating in clusters. According to Slavova and Bankova (2017), the cluster approach is effective to achieve sustainability goals. By cooperating with neighboring companies, Helthjem can increase their innovation, reduce the complexity in implementing sustainable solutions, make synergies by adopting complementing initiatives and improve their capabilities. For instance, both DHL (2016)

and Helthjem discussed establishing P2P drop-off networks, which is a centralized location where circular services are performed. Helthjem believed that this should be established in cooperation with other companies, in order to ensure that they can keep focusing on their core business and facilitate for their customers' circular strategies. In order to establish important partnerships and cooperate with customers, establishing a strong brand in the market is an important contributor. As shown in the result, both Bergans and Greenphones believed that Helthjem would strengthen their brand and reputation among consumers by associating themselves with circular companies. This complies with the literature presented by Park, Sarkis, and Wu (2010), who found that the implementation of CE and GSCM provides companies with value creation, such as an improvement of their reputation.

Even though all of Helthjem's customers most likely will affect their SC, some might have a bigger influence than others. For instance, both Red Cross and Bergans only uses Helthjem in their pilot projects and are using other transport service providers in the rest of their SC. However, Bergans is planning on expanding their CE strategies, such as selling used products and providing rent services at their web page, as well as making their repair services more accessible. This represents a potential for Helthjem, as Bergans explained that the consumers that tested the subscription service was satisfied with the service offered by Helthjem. According to Sakhuja and Jain (2012), to deliver appropriate services to the customer it is important to select capable service providers to perform the service. Therefore, Bergans might decide to expand their relationship with Helthjem when adopting new strategies, as they already know that consumers are satisfied with Helthjem's services. Hence, Helthjem might want to adapt to these new CBMs and show that they are a natural choice when selecting who should perform the freight services.

Both Finn.no and Greenphones have included Helthjem in a larger portion of their SC. Finn.no has chosen Helthjem to be their official transport service provider by offering them as an option at their platform, while Greenphones was planning for Helthjem to transport all their sold phones to consumers and companies. The relationship with Finn.no is well-established, as they have been a customer of Helthjem for four years. By having this close relationship, Finn.no probably has an influence on Helthjem. Additionally, they both are owned by Schibsted, which might make it even easier to cooperate and influence each other. As Greenphones is a new customer of Helthjem, their relationship is not as well-established

yet. Still, Greenphones has several ideas that could be realized through a partnership, such as implementing a zero-waste strategy in the packaging. According to Orzan et al. (2018), adopting sustainable packaging is both beneficial for the environment and provide companies with a competitive advantage, which implies that Helthjem should consider this option for the future. Therefore, an option can be to explore this further through a pilot project. As argued by Slavova and Bankova (2017), cooperation might lead to innovation and implementation of sustainable solutions, and this might be the reality once a stable relationship has been established between Helthjem and Greenphones.

Even though Red Cross have included Helthjem only in the pilot project and are not planning on adopting any new CE strategies soon, their relationship is probably still important for Helthjem. As explained by the respondent at Helthjem, their cooperation through the pilot project have provided both parties with valuable insights. Therefore, keeping these types of relationships that enhance innovation is key when transitioning to a CE. As stated by the Ellen MacArthur Foundation (2014), BMI is crucial in order to mainstream the CE principles in B2B relationships. This means that even though some customers are smaller, newer, or provides less economic value than others, building close relationships that enhances cooperation and BMI is crucial in order to achieve a CBM. On that account, Helthjem should listen to all their customers' inputs and adapt their SC to meet these requirements, if it is possible.

## **5.4 Challenges the Transport Service Providers Face**

This section seeks to answer RQ3, thus, *“What are the challenges Helthjem may face with a shift from a linear to circular SC among their customers?”*. To discuss the challenges, the following sections will be structured into four main parts: economic, network, uncertainty and environmental challenges.

### **Economic Challenges**

The economic considerations are a challenge mentioned by both Bergans and Red Cross. To make CE strategies valuable and possible, the first needed action is to prolong the life cycle of the products. This might be challenging, because it often results in increased costs (Sauvé, Bernard, and Sloan 2016). The respondent at Bergans mentioned this as two conflicting

goals in their BM, because they first and foremost are a company that sells new products to achieve a profit. Still, they want to contribute to the CE, but they have not yet been able to make all their circular solutions profitable. This dilemma result in an uncertainty related to what strategies the customer will adopt. Helthjem wants to facilitate for circular solutions, and therefore they need the customers to be willing to invest in these strategies. However, this might be challenging for some because their circular solutions are not yet profitable, and the overall goal for the company is to earn a profit (Chopra and Meindl 2016). For instance, Red Cross explained that repair is an expensive service that require large volumes to be profitable, and Bergans mentioned that the consumers´ expectations of free freight are a huge challenge to make these strategies valuable.

There is an inherent uncertainty related to if the CBM ever will be profitable. Guide, Harrison, and Van Wassenhove (2003) argued that some sustainable solutions never will be profitable, no matter how intelligent and innovative the BM is. On the other side, Linder and Williander (2017) argued that CBMs will help the companies to achieve cost savings, among other benefits such as reduced environmental impact. These statements point in opposite directions, which result in no common agreed upon recommendations for companies in the service sector for how the CBM will affect their business. Due to the conflicting literature, it might be difficult for Helthjem to decide to what extent they should invest in circular solutions.

### **Network Challenges**

A challenge for Helthjem is to find the most appropriate balance between having the right capacities and capabilities to meet customer requirements, and at the same time reduce the number of resources in use. This was mentioned by Red Cross, who argued that Helthjem does not have the right capacity to handle the large volumes required to make circular services profitable. Having spare capacity and flexibility will according to Inigo and Blok (2019) decrease operational risk. Still, based on a lack of research and evidence of how CE strategies will affect the service SC, it might be difficult for Helthjem to know which capacities and capabilities that is the most appropriate. As stated by Helthjem, there is a challenge to know when to do the right investments. It can be crucial that Helthjem is proactive in order to avoid falling behind their competitors. To be able to deliver appropriate

services in this situation, they might need to use excess resources and capacity, which contradicts with the reduce principle (Ghisellini, Cialani, and Ulgiati 2016).

Our findings further indicate that the process of expanding their coverage might result in increased delivery times, especially in the northern part of Norway. Finn.no believed that this would be a challenge for Helthjem, because the predictability and efficiency to the northern part of Norway will be poor. Helthjem agreed that predictability is a problem to Northern Norway, as the infrastructure on this route is of poorer quality than other parts in the country and deliveries to these areas can take up to a week. On top of that, it is often harder to utilize the whole capacity of the trucks on the longer distances. Additionally, in the northern part of Norway, the consumers are more widespread than in the southern areas. This makes it even more challenging for Helthjem to utilize the capacity because their BM is appropriate for just small and medium packages, not large ones. Even though most customers expect Helthjem to expand their coverage, Helthjem face split customer requirements. Our findings indicate that Finn.no wants Helthjem to expand their coverage, but on the other side they believe that this will have a negative effect on the environment. This is because increased coverage means that even more consumers have access to consume resources, which increases the environmental footprint. This shows that it will be challenging for Helthjem to satisfy all the customers' conflicting goals. This is a challenge related to the trend that SCs have become more complex (Abbasi 2012, Morana 2013).

Another network challenge might be the chosen time of delivery. Helthjem deliver and pick up their packages at night. This is beneficial for the carrier since they are avoiding large queues, thus reducing their emissions of GHGs. This is confirmed by Bhavesh and Chetan (2020), who argue that reducing for instance fuel consumption and delivery time during the day is efficient measures to implementing CE into freight companies. However, by practicing this time of delivery, Helthjem are facing some limitations, such as not being able to deliver all types of products. For instance, products that require the consumer to be present at the delivery, such as TVs and laundry machines from Finn.no, cannot be transported by the Helthjem carriers. The ability to transport all kind of reused products is important. Diversity is a key in the transition into a CE, and one of the characteristics for CE (Ellen MacArthur Foundation 2015, Ulanowicz et al. 2009). Additionally, the time of delivery is challenging when implementing for instance the rent strategy. To make the rent strategy

valuable, the delivery and pick-up should be based on the consumers' needs. Like the BM of Helthjem are structured today, the carriers are not able to pick up the rented products during the day. When a consumer's rental period is finished, the product should quickly be inspected and cleaned before being rented to the next consumer. Therefore, the time aspect is a prerequisite to make the rent service profitable.

An important factor to make time of deliveries efficient is the reversed logistics. When transitioning from a linear to a circular model, there is a need to establish a return flow in addition to the regular flow in the SC (Eftestøl-Wilhelmsson, Sankari, and Bask 2019). Helthjem have an established return network, the challenge is to get the consumer to use it in order to reduce the number of vehicles on the road, as well as to reduce the demand fluctuations. According to Östlin, Sundin, and Björkman (2009), one of the challenges with the CBM is the return flow where capacity planning is a struggling part. There is an inherent uncertainty in predictability and reliability in this flow, which makes it difficult for Helthjem to make it valuable. van der Valk (2015) found in his study that the reversed processes often are treated as a silo, which makes it difficult to achieve a holistic approach. A typical result of treating the reversed processes as a silo is an increased probability for failure of implementing CE (De Angelis, Howard, and Miemczyk 2018). Today's customers have increasingly high requirements (Yihsing Yang et al. 2013), where some of them is speed in their deliveries. This can be exemplified by considering the rent strategy, where speed is essential to be profitable. This is because the less time that is spent on transporting the products, the more they can be rented to consumers. This is confirmed by Bonev (2012), who explain that reversed logistics can increase customer support and help gain a competitive advantage, as well as ensure profitability.

When both the regular and reversed flows in the SC are established, the next important step to achieve a CE is to close the loop. The implementation of this kind of SC is not an easy task, where one of the challenges is the need for coordination of customers, suppliers and non-profit organization (De Angelis, Howard, and Miemczyk 2018). A big challenge for Helthjem is to get all their customers to think in systems, as they all most likely want their own specialized services. This can be illustrated through Greenphones' wish to implement a personalized zero-waste packaging strategy in cooperation with Helthjem. All actions should be based on what's the best for the system they operate in which is a prerequisite for



implementing the integrated concept of CE (Ghisellini, Cialani, and Ulgiati 2016). Therefore, there is no room for silo-thinking.

### **Uncertainty Challenges**

There is an uncertainty of how the CE will develop further, and what strategies that will be the most valuable. According to Hussain, Khan, and Al-Aomar (2016), there is an increasing awareness among consumers about the benefits of services that are environmentally friendly. As an example, it is hard to predict how fast the reuse trend will grow, as it will depend on the attitude among consumers. Baxter, Aurisicchio, and Childs (2017) points out consumer attitude as a challenge in the transition into a more CE. Another uncertainty in Helthjem's SC is that all four customers have different products. Handling unique products means that the consequence of losing them during transportation or theft is more severe than it is with standardized items. Additionally, Helthjem explained that circular products often are designed with durable materials, which sometimes makes them more expensive and therefore increase the risk of theft. This is also confirmed by Prendeville and Sherry (2014), who explained that products for reuse must be designed with durable materials. Accordingly, it is difficult for Helthjem to transport products with a higher value than 10.000 NOK. If the products get lost during transport, they cannot solve the problem and will lose trust. This problem is mentioned by Finn.no, who explained that risk of theft is prominent since the collection and deliveries are from the customers' doorsteps at night. Therefore, they find it difficult to use Helthjem for high-value products, which represent a limitation in Helthjem's SC.

As there is an increasing trend of unique and valuable products among Helthjem's shipments, the importance of data tracking and information sharing is more essential. For Helthjem this include more cooperation with their customers as well as higher requirements for internal information systems. Helthjem explained in their interview that data tracking and information is something they find challenging, because they have few tracking points which makes them vulnerable if something happen to the product. This threatens the customers' and consumers' trust in the Helthjem brand. Having few tracking points in their system is especially challenging when implementing the rent strategy, as it requires detailed information because of the frequent shift of users.

Another issue regarding data tracking and information is the customer service. Consumer contact is an essential part in order to make the service SC valuable, as it is crucial to know your customer in the delivery stage of the service SC (Baltacioglu et al. 2007, Cho et al. 2012, Drzymalski 2012, Shepherd and Günter 2006, Yap and Tan 2012). Both Bergans and Finn.no explained in their interviews that they are concerned about the ability to communicate with the consumers. The reason for this concern by Bergans and Finn.no is related to the struggle to build relationships with the consumers because of deliveries at night, where there is no direct contact when the shipments are delivered. The consumer contact can be a crucial factor for Helthjem's, as trust can be a factor for loyalty and long-lasting relationships. It is challenging for Helthjem to build trust with the consumers when they do not have any direct contact with them and lack documentation because of their few tracking points. Because of this lack of documentation, it can be challenging to answer consumers' queries.

### **Environmental Challenges**

The awareness of environmental challenges among Helthjem's customers is high and they all want to reduce the environmental footprint. For many of the customers, Helthjem handles the transport services between the customers and the private consumers. Therefore, they are all a part of a complex SC network. To be able to transition into a more CE, all actors need to think in systems, as it is a fundamental characteristic of CE (Ghisellini, Cialani, and Ulgiati 2016). With this in mind, Helthjem has a responsibility to reduce their GHG emissions, kilometers on the road and vehicles in use (Bhavesh and Chetan 2020, DHL 2016). As Finn.no mentioned, all consumption is a threat for the environment, but the most important is that the transport is done in an environmentally friendly way. The transport sector stands for some of the main sources contributing to emissions of GHGs and therefore represent large opportunities to reduce the use of energy and resources (Deloitte 2020). Helthjem are already on a good pathway into a more circular transport system.

## **5.5 Overcoming the Challenges**

Knowing which challenges both Helthjem and their customers believe Helthjem are facing, this section aims at discussing RQ4, *“How can the transport service providers overcome*

*such challenges?*”. The discussion will be conducted in the same structure as the previous section, aiming at answering how to face all challenges discussed in RQ3.

### **Economic Challenges**

Helthjem aims at facilitating for circular solutions, but at the same time to be profitable. Guide, Harrison, and Van Wassenhove (2003) argued that some circular solutions will never be profitable, but Linder and Williander (2017) argued that the CBM will gain benefits such as cost savings, potential to differentiate, enhanced customer relationships and reduced environmental impact. When the uncertainty for the CE strategies increases as well as it is unsure if these are valuable, it is hard for companies with the main objective to be profitable (Chopra and Meindl 2016). Here, Bergans suggested to face this challenge by continuously working towards increasing their volumes. When they reach a certain level of volume, the profits will be equal to the costs. However, reaching the goal to be profitable would be even easier if the consumers were willing to pay for the freight services, and therefore, a customer perception needs to be changed.

Lewandowski (2016) argued that all BMs will in some way be a combination of linear and circular. According to Guide, Harrison, and Van Wassenhove (2003), the right pathway into CE is a viable BM combining profitability with environmental sustainability. Today, Helthjem’s BM is a combination of linear and circular, because they offer transport services to earn profit but at the same time try to facilitate for circular solutions as well as reduce their emissions. This means that further circular actions should be conducted step by step in accordance with their customers. As explained by both Helthjem and Red Cross, product development and cooperation are an important measure in making the BM more circular. For instance, through pilot projects they will find out which solutions they should invest in. This illustrates the importance of well-established relationships between Helthjem and their customers in order to having successful projects and transitioning into a CBM (De Angelis, Howard, and Miemczyk 2018).

### **Network Challenges**

In order to achieve the required capacities and capabilities, cooperation with appropriate actors might be a solution. According to Slavova and Bankova (2017), cooperating with neighboring companies is an effective strategy to achieve sustainability goals, thus

facilitating for a CE. Such cooperation implements system thinking and will most likely benefit all actors in the long run. This might help companies utilize the benefits from a CBM, which is cost savings, potential to differentiate, enhanced customer relations, better understanding of the customer behavior and reduce environmental impact (Linder and Williander 2017). To overcome challenges in the transition into a CE, Helthjem should cooperate with other green actors to make the system in the service industry more circular. For instance, cooperation with other transport service providers might assist Helthjem to be able to handle larger packaging sizes and face the capacity issue. According to Chopra and Meindl (2016), the trend of companies specializing and focusing on their core competencies, while outsourcing the rest, is increasing. By doing so, Helthjem would continue to specialize in their most appropriate area, which is transporting small to medium packages, while at the same time offer solutions for larger shipments to their customers. This will help them avoid having excess capacity, resources, and provide the customers with a full customized service.

Another way of offering a customized service, is to expand the window of delivery. Since Helthjem today mainly are delivering and picking up packages during the night, they are facing some challenges. These issues include that they are not able to deliver all types of products and that some CE strategies might be hard to implement. Once again, a beneficial and possible solution to these mentioned challenges is cooperation. As of January 2021, Helthjem did enter a partnership with the Norwegian company Kolonial, who is an online grocery store that offers home delivery services to consumers during the day. This partnership provides consumers with more complete home delivery services, as they can receive both groceries and e-commerce products at the same time at different times during the day (Helthjem 2021). Through this cooperation, the probability of theft is reduced because of flexibility in the time of delivery. These kinds of partnerships should be extended and expanded further to stay competitive, capture customers and transition into a CE.

Predictability of shipments to the northern part of Norway is also another network challenge, but Helthjem argued that offering better tracking will improve the predictability. Helthjem is continuously trying to improve their data tracking and as mentioned in the result, some of their competitors are using advanced technologies such as RFID which provides them with a competitive advantage against Helthjem. According to De Angelis, Howard, and Miemczyk (2018), utilizing technology systems in the SC might lead to closer customer

relationships. Therefore, improvement of data tracking is a needed action for Helthjem in order to stay competitive and easily increase their coverage in Northern Norway. Similarly, the use of data technology might assist Helthjem in improving their capacity utilization on longer distances. However, these systems require time and effort to create value and to be successfully utilized. Although, this action is needed in order to stay competitive.

Another strategy to stay competitive and face their network challenges is to optimize their return flow, which can be handled in several ways. The challenges within reversed logistics from our findings include how to increase the volumes, avoid the silo approach, optimize the speed, and having the service available when the customer require it. To increase the volumes in the return flow, the first efficient action can be to make the consumers aware of the service and its benefits. This was a measure suggested by both Greenphones and Finn.no, who argued that they could help Helthjem overcome this challenge by trying to utilize their impact to having consumers chose Helthjem to transport their products. Furthermore, the silo approach should be avoided to be more circular. As mentioned before, CE is a holistic concept which means the total value increase when the whole system works together (Ellen MacArthur Foundation 2015). As stated by De Angelis, Howard, and Miemczyk (2018), treating the reversed processes as a silo will make the implementation of CE fail (Guide, Harrison, and Van Wassenhove 2003). A challenge for Helthjem is the transport of rented products. Whenever a product is rented, it is crucial that the user quickly can return the product to ensure that the service is valuable. Here, similar partnerships such as the cooperation with Kolonial may provide Helthjem with better opportunities to facilitate for the rent strategy (Schibsted AS 2021).

When the reversed logistics is optimized, the next step to achieve a CE is to close the loop by thinking in system (Ghisellini, Cialani, and Ulgiati 2016, Yang et al. 2018). Therefore, Helthjem must coordinate their customers, suppliers and other organizations to facilitate for the most beneficial services for their customers and the final consumers. This can be achieved by practicing the cluster approach, which will reduce the overall consumption and resources in use (Slavova and Bankova 2017). Moreover, another important action is to improve the information flow between the actors in the network, as an accurate information flow contribute to efficient service SCs (Cho et al. 2012). As explained by Techane (2020), digitalization can contribute to optimize the sustainability of the SC through advanced

information analysis tools. With this in mind, Helthjem could share data and information across the actors to understand the information flow and distribution in a more detailed way.

### **Uncertainty Challenges**

The success of CE strategies depends a lot on customer attitude and market trends, which therefore makes it an important challenge in making the strategies valuable. Khan, Daddi, and Iraldo (2020) said that to utilize the CE opportunities and face the challenges, there will be important to know the customers, market trends and the competitors' actions. In order to do so, Helthjem need continuous communication and relationship building with these actors. This was mentioned by Greenphones, who believed that an important action in assisting Helthjem is to keep them updated and involved in Greenphones' plans and experiences. Also Red Cross believed that cooperation through pilot projects is important to build relationships and learn important lessons for the future to face the volatile market. As stated by Yihsing Yang et al. (2013), as the customer requirements increase, it becomes essential for companies to work closely with their clients to understand their behavior.

The consequences of theft or loss are more severe with circular products compared to standardized items. To overcome this challenge, Helthjem suggested insurance as an important action. By offering better transport insurance, Helthjem builds trust with the private consumers. As consumers are skeptical to the quality of reused products and need reassurance from a professional actor (Prendeville and Sherry 2014), similarly, insurance makes the consumers trust Helthjem. Still, this insurance cannot replace the emotional value, which is an inherent uncertainty with circular products. Luckily, there are some measures that can be implemented to avoid some loss of these products. As suggested by Helthjem, cooperation with other transport service providers to establish delivery lockers is appropriate to avoid theft in the delivery phase. These types of delivery lockers are already established in Norway by other transport service providers such as Posten (Posten AS 2021), which enables the likelihood of establishing such cooperative relationships.

Our findings suggest that an increased number of tracking points might improve the uncertainty connected to customer service and documentation. For instance, their current tracking system does not include a tracking point when the shipments are loaded onto cars and trucks but is possibly something they should include in the future to achieve more

transparency of their processes. By doing so, they are possessing more detailed data and are better equipped to answer consumers' queries in case of deviations, which will increase the quality of their customer service. Similarly, Savitz and Weber (2014) explain that customer satisfaction is a prerequisite in growing the business and achieving a CE. Better tracking and documentation are also important to facilitate for circular solutions. For instance, the rent strategy requires detailed information because of the frequent shift of users.

### **Environmental Challenges**

As a transport service provider, one of the main challenges to overcome is to reduce their GHG emissions, kilometers on the road and vehicles in use (Bhavesh and Chetan 2020). Since transport services represent a threat for the environment, the most important for Helthjem is to make it as environmentally friendly as possible. Therefore, in order to reduce GHG emissions, Helthjem should continue to work towards their goal of reducing their Co2-emissions with 50 percent by 2025 (Helthjem n.d.-c). This is in accordance with the literature presented by Eftestøl-Wilhelmsson, Sankari, and Bask (2019), who explained that sustainable transport options such as electric cars and bikes are necessary. This is especially important in urban areas, as this is where LML is the most expensive and polluting (Ranieri et al. 2018). To reduce the GHG emissions on the longer distances, Helthjem should utilize the full capacity of the trucks. As Helthjem is utilizing an already existing network, the truck routes are predetermined and must be driven every day to also deliver newspapers. With this in mind, Helthjem's main objective is to fully utilize the capacity of these trucks, both in the regular and return flow. As argued by DHL (2016), reducing the number of near-empty vehicles on the road is an action to facilitate for CE in the transport industry. In order to utilize their capacity to the fullest, Helthjem must increase their volumes by having more customers, as well as engage in cooperation with other freight companies.

## **5.6 Chapter Summary**

Based on the RQs, this chapter has linked the findings and the existing literature together. This has revealed the similarities and differences between the results and theory, as well as provided new insights into the explored topic. Accordingly, this has provided documentation about how CE principles might transform the service value chain. Throughout the discussion, different conclusions have been found, which will be presented in the next chapter.

## 6.0 Conclusion and Implications

### 6.1 Chapter Introduction

This chapter's objective is to summarize and present the conclusions found in this study. First, a summary of the findings is given, followed by a conclusion. Further, both the theoretical and managerial implications are presented. Finally, the limitations of the study and recommendations for further research are identified.

### 6.2 Summary of the Findings

This study sought to address four RQs, where RQ1 is “*What CE strategies have the transport service providers and their customers already adopted and how are they utilizing them?*”. The findings of RQ1 shows that Helthjem and the different customers all practice various combinations of the CE strategies according to the 3Rs: reduce, reuse and recycle, and that some might adopt even more strategies in the future. The companies that practice the reduce principle include Finn.no, Greenphones, Bergans and Helthjem. Both Finn.no and Greenphones do so by reducing the number of new materials entering the market each year and reducing the amount of waste, while Bergans designs durable products and practices redesign. Helthjem follows the reduce principle by using electric cars and bikes, having carriers deliver shipments by foot in central Oslo, reducing queues by driving at night, and through supporting and facilitating for circular solutions among their customers. Furthermore, all four customers are practicing the reuse principle, as they all sell reused items. Additionally, Greenphones and Bergans also practice this through offering repair services, as well as Finn.no and Bergans offering rental solutions. Finally, the only company that practices the recycle principle as of today is Greenphones, as they have a recycling partner that they ship the products that cannot be resold to.

RQ2, “*How are these adopted CE strategies affecting the transport service providers' value chains?*”, was answered by asking the customers how they believe their adopted strategies are affecting Helthjem. All customers agreed that Helthjem need to cooperate and build stronger relationships in their SC, as well as experience a volume growth. Additionally, Bergans and Greenphones believed that Helthjem's cooperation with circular companies



would strengthen their brand, and Greenphones also believed that Helthjem would need to adopt more personalized services into their SC.

To explore RQ3, “*What are the challenges the transport service providers may face with a shift from a linear to a circular supply chain among their customers?*”, both Helthjem and the customers were asked this question. Here, several challenges were mentioned by the customers: costs, customer service and theft, rapid changes, brand profiling, coverage, efficiency and predictability, and environmental challenges. Moreover, the challenges mentioned by Helthjem concerned unique and valuable products, infrastructure, time of delivery, customer service and documentation, coverage, predictability and accuracy, and finding the right timing.

Finally, RQ4, “*How can the transport service providers overcome such challenges?*”, aims at answering how Helthjem can overcome the challenges mentioned when investigating RQ3. Bergans believed that they could help Helthjem through increasing their volumes and thus making their circular projects profitable, while Greenphones argued that they need to make an impact among the consumers and involve Helthjem in their plans and ideas. Finn.no believed that they need to continue to offer environmentally and simple solutions to the consumers, while Red Cross claimed that they can assist Helthjem through product development and helping them position their brand among consumers. Moreover, Helthjem mentioned several measures to overcome their challenges: better insurance, cooperation, tracking and documentation, building relationships with customers, reducing their environmental footprint, and adopting new services.

### **6.3 Conclusion**

As the purpose of this study is to answer how CE principles can transform the service value chain, the findings have provided information which makes it possible to draw conclusions. Thus, it is evident that companies from various industries practices different CE strategies. For instance, while Helthjem practices reduce through investing in a fleet powered by alternative fuel options and facilitating for CE among their customers, the other companies focus on reduce through waste and resource reduction. Helthjem’s aim at facilitating for CE

shows that a transport service provider is key in the CE, as they have provided easier access to for instance rent and repair services for consumers. The findings further indicate that the reuse strategy has some challenges, as some consumers tend to sell or donate their used products to ease their conscience. Also, consumers are skeptical to whether the ads describe the quality of the used products correctly, but this is possible to mitigate by having a professional actor perform the maintenance and repair services. It also indicates that easy accessibility is key when providing circular solutions to the consumers, such as repair services. Moreover, the findings show that the recycling strategy is not widespread among the companies, as downcycling is the most common use of recycling today. However, it is argued that it is more likely to develop technologies to achieve upcycling of materials through cooperation between various companies.

Further, the evidence suggests that the various customers might affect the transport service provider differently. This is because some of the customers have a closer relationship with Helthjem than others, which has been established over time or through pilot projects. Additionally, three of the customers are categorized as PSSCs, and one of the benefits derived from this type of SC is volume growth, which again affects the volume transported. However, the combination of different customers might be difficult to handle, which makes transparency and detailed communication between all actors in the SC an important priority. Accordingly, the evidence indicates that cooperation to offer complete and personalized services to the different customers becomes crucial as CE strategies emerge.

The findings also suggest that the challenges can be divided into four main categories: economic, network, uncertainty and environmental challenges. The economic challenges concern that, as of today, most circular solutions are not yet profitable, and therefore some customers are not willing to invest in such solutions. The network challenges include the question of whether the transport service provider is possessing the right capacities and capabilities to succeed. For instance, customers wish for increased coverage, but this raises the issue of lead times and predictability. The time of delivery is also challenging because it limits the transport company from delivering certain product types and performing all CE strategies, seeing that rent services would be even more efficient if the consumers could deliver and receive the products whenever during the day or night. Similarly, with an infrastructure that only fits small to medium packages, it becomes difficult to transport larger

products that has a huge potential to succeed in the rent strategy, such as tents. The uncertainty challenges include the importance of customer perception, because it is hard to predict exactly how fast the CE trend will grow. The findings further indicate that another uncertainty challenge in the SC is that circular products often are unique and sometimes of high value, which means that the consequences of theft and loss are more severe compared to linear items. Finally, the environmental challenges concern that transport services represent a significant source of GHG emissions, especially in the LML. This becomes an even larger challenge for the transport service provider as their customers are transitioning into a CE, because they most likely want a transport service provider with low emissions.

Besides, the following strategies were found as solutions to the above-mentioned challenges. First, to face the economic challenges, measures such as increasing the transported volumes and normalizing that consumers need to pay for freight services were suggested. Also, the evidence suggests that cooperation with customers to conduct pilot projects are essential, as it helps the transport service providers in discovering which solutions that are profitable and not. Furthermore, the network challenges may be faced by cooperation with appropriate actors, such as to transport larger shipments and to expand their delivery window. Moreover, the use of technology to improve their shipment tracking is a measure to face the issues regarding lead times and predictability. To face the uncertainty challenges, the findings indicate that continuous communication and relationship building with the customers might result in increased knowledge regarding consumer perceptions and market trends. Furthermore, the use of insurance and cooperation with other transport service providers to establish delivery lockers are measures to overcome the risk of loss and theft. If a deviation does occur, an increased number of tracking points is beneficial to spot where exactly the error happened, which also improves the quality of the customer service. Finally, the environmental challenges include that transport service providers should invest in more trucks and cars powered by alternative fuel options, as well as continue to utilize deliveries by foot and bikes. On the longer distances, actions to optimize the capacity usage to reduce the number of near-empty vehicles on the road is important to facilitate for the CE.

All in all, CE principles are utilized differently by companies which further bring varying challenges for the transport service providers and their value chain. These challenges vary and are complex, which in the very end means that the transport service providers need to

understand their customers to overcome them. Suitably, the findings indicate that cooperation with other actors and customers is the most dominant strategy to overcome several of the challenges a transport service provider faces in the transition from a linear to a CE. Next, the theoretical and practical implications are explained.

## **6.4 Implications**

### **6.4.1 Theoretical Implications**

In terms of theoretical implications, previous studies have concentrated on the product value chain and how to develop circular solutions for products and production processes (Mendoza et al. 2017, Rashid et al. 2013). In contrast, there is a lack of research surrounding the service industry. The findings in this study contribute to theory related to real-life applications for how CE strategies might transform the value chain of a company in the service industry. This thesis illustrates and documents that the pathway into becoming more circular are different for various companies, depending on which CE strategies they adopt. This study also confirms that as of today, there are several barriers for implementing the CE in the service industry (Kirchherr, Reike, and Hekkert 2017). Accordingly, this thesis provides theoretical evidence of how companies may overcome the barriers to implement CE among service providers. The findings also confirm that several companies have the willingness and interest to adopt more services into their BM and transition into a CE.

### **6.4.2 Practical Implications**

Understanding how companies' utilization of CE strategies affect the value chain is useful in order to encourage more companies to invest in circular solutions and is crucial to reduce the increasing global consumption. The documentation and evidence of this study illustrate that a transport service provider will face challenges as their customers are becoming more circular, but they are possible to mitigate. Therefore, several companies can contribute to the shift towards a more CE. Furthermore, as more companies are adopting circular strategies, discoveries on how to perform these services and at the same time be profitable emerges. Overall, CE principles facilitate for sustainable value creation and this study confirms that a transport service provider can utilize this concept. In the last section, limitations of this study and suggested areas of further research are presented.

## **6.5 Limitations and Further Research**

### **6.5.1 Limitations of the Study**

This study has limitations which may impact the findings. First, the number of customers included in this thesis is limited. This confines how valuable the study is compared to including more companies and industries within the service sector. Second, the methodology is restricted to semi-structured interviews which brings a certain kind of information. To face this issue and extend the gathered data, focus groups would be an appropriate method to obtain more detailed insight into this topic. Furthermore, the data analysis may impact the findings. The gathered data are cleaned and analyzed by the researchers of this study, who also conducted the interviews which may cause some missing information in the result. Lastly, based on the framework and time schedule for this thesis, the study is limited to the Norwegian market. To increase the international value, it would be beneficial to include companies and cases outside the national borders.

### **6.5.2 Areas of Further Research**

In order to deepen the understanding on how CE principles can transform the service value chain, the results and limitations of this study suggest some areas for further research. First, one of the suggested areas is to compare different transport service providers, as this study includes only one transport service provider and their customers. More companies in the service sector need to be explored in order to obtain knowledge of this growing industry and further transition into a CE. Second, this study only investigates a transport service provider in Norway, but this should be extended to include more countries. It can be beneficial to cover cultural differences that might exist in various countries, thus, providing an internationally valuable research. Finally, this research has ignored the effect of governmental interventions to facilitate for the CE. Therefore, investigating how this will benefit the service providers in a transition to the CE can be useful. All in all, CE in the service industry is an area which requires further research from different points of view to enhance the adoption of CE strategies into the service SC.

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# Appendix 1: Interview Guide for Helthjem's Customers

## (A) General questions

1. How do you do business?
2. What does your supply chain look like?
3. Where in your supply chain are you using Helthjem as a transport service provider?
4. Which selection criteria is the most important to you when selecting a transport service provider?
5. Why have you chosen Helthjem to be your transport service provider?
6. For how long have you used Helthjem as your transport service provider?
7. How do you interact with Helthjem as your transport service provider?
  
8. Why is it important for you to provide a platform where users can buy used products as well as additional services to ensure prolonging the products' lifetime?
  - a. Do you believe that this kind of service value chain is the future? How and why?
9. How have you seen that the trend of buying used materials have developed among user over the past three years?
  - a. What do you think is influencing this trend?
10. How do you predict this trend to further develop the next three years?
11. How can you ensure that the trend of buying used materials continues?
  - a. What challenges does this bring?

## (B) CE related questions

1. What CE strategies have you already adopted?
  - b. If you have, why? If not, why not?
2. How are you using these strategies?
  - a. Are there any benefits so far from adopting these CE strategies?
3. How do you think these adopted strategies are affecting Helthjem?
4. What CE strategies are you planning to adopt?
  - a. How will you utilize these strategies?
  - b. How do you think these strategies will affect Helthjem?
5. What challenges do you think Helthjem may face from you transitioning into a circular economy?
  - a. How do you think you can help Helthjem to overcome such challenges?



## **Appendix 2: Interview Guide for Helthjem**

1. What does your entire supply chain look like?
2. Which CE strategies have Helthjem already adopted? If yes, please go to 2a and b.
  - a. What are these CE strategies and why have you chosen those strategies of all CE strategies?
  - b. How is Helthjem utilizing such CE strategies?
3. Do you think these adopted CE strategies are affecting Helthjem's supply chain?
  - a. If yes how? If not, why not?
4. What are the challenges Helthjem may face especially with Helthjem's customers' transition into a CE?
5. How can Helthjem overcome such challenges?