

IMPLEMENTATION OF CIRCULAR ECONOMY PROJECTS:

**EXPECTATIONS, OPPORTUNITIES, AND IMPEDIMENTS IN FINNISH
MSMEs**

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**Author: Juho Saarinen
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Supervisor: Marileena Mäkelä**



JYVÄSKYLÄN YLIOPISTO
UNIVERSITY OF JYVÄSKYLÄ

ABSTRACT

Author Juho Saarinen	
Title Implementation of Circular Economy Projects: Expectations, Opportunities, and Impediments in Finnish MSMEs	
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<p>Abstract</p> <p>Circular Economy (CE) has received worldwide and growing attention as a concept that could provide a sustainable and resource-efficient alternative for the dominant linear economic development model. Despite the attention and potential in creating business value without compromising the integrity of natural ecosystems, the global CE transition is still at its early stages. Micro, Small, and Medium-sized Enterprises (MSMEs) play a crucial role in this transition. Consequently, the micro-level implementation of CE has gained an increasing research interest in recent years. However, the project nature of implementing CE at the micro-level seems to be somewhat overlooked in the current literature.</p> <p>The primary objective of this thesis is to explore the expectations that Finnish MSMEs have for the implementation of CE projects. Also, the thesis aims to examine the perceived impediments and opportunities of implementing CE projects within Finnish MSMEs. By exploring this topic, the thesis intends to provide results that contribute to achieving a more holistic understanding of impediments and opportunities that may occur during CE projects and what is expected from the CE projects. The thesis explores the topic by conducting a qualitative study based on eight semi-structured interviews within six different companies.</p> <p>The results discovered various expectations, impediments, and opportunities to implementing CE projects within Finnish MSMEs. The expectations were primarily related to gaining financial and non-tangible benefits through the projects. Also, pursuing CE projects was expected not to compromise the day-to-day operations of the companies. The results also indicated that uncertainty, lack of time and human resources, COVID-19, and external financing were seen as impediments. Thus, possibly hindering the successful implementation of CE projects. In contrast, the results also indicated that perception of CE and commitment, along with availability to CE-related information and training, were seen as opportunities. Thus, possibly supporting the successful implementation of CE projects.</p>	
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<p>Tiivistelmä</p> <p>Maailmanlaajuisesti kasvavan huomion saavuttanut kierrätys voi konseptina tarjota kestävämmän ja resurssitehokkaamman vaihtoehdon vallitsevalle lineaariselle talousmallille. Vaikka kierrätys tarjoaa mahdollisuuden luoda liikearvoa luonnon ekosysteemien koskemattomuutta vaarantamatta, on globaali siirtymä kierrätystalouteen vasta alussa. Mikro, pienet ja keskisuuret yritykset (PK-yritykset) ovat ratkaisevassa osassa tätä siirtymää, jonka seurauksena kierrätystalouden mikrotason toimeenpano on saavuttanut viime vuosina kasvavaa mielenkiintoa tutkimuskohteena. Projektitason toimeenpano näyttää kuitenkin olevan jokseenkin huomiotta jäänyt aihe nykyisessä kirjallisuudessa.</p> <p>Tämän tutkimuksen pääasiallinen tavoite on tutustua odotuksiin, joita suomalaisilla PK-yrityksillä on kierrätysprojektien toimeenpanoon liittyen. Lisäksi tämä tutkimus pyrkii selvittämään minkälaisia haasteita ja mahdollisuuksia kierrätysprojektien toimeenpanolle nähdään suomalaisissa PK-yrityksissä. Tämä tutkimus pyrkii tuottamaan tuloksia, jotka edesauttavat saavuttamaan holistisemmän ymmärryksen haasteista ja mahdollisuuksista, joita kierrätysprojektien aikana voi ilmetä, sekä selvittää mitä kierrätysprojekteilta odotetaan. Tutkimus perehtyy aiheeseen kvalitatiivisen tutkimusmenetelmän kautta, joka pohjautuu kahdeksaan puolistrukturoituun haastatteluun kuudesta eri yrityksestä.</p> <p>Tulokset paljastivat moninaisia odotuksia, haasteita ja mahdollisuuksia liittyen kierrätysprojektien toimeenpanoon suomalaisissa PK-yrityksissä. Odotukset liittyivät pääsääntöisesti taloudellisen ja aineettoman hyödyn saavuttamiseen projektien kautta. Lisäksi kierrätysprojektien tavoittelun odotettiin olevan vaarantamatta yritysten päivittäistä toimintaa. Tulokset osoittivat myös että, epävarmuus, ajan ja henkilöstön puute, COVID-19, sekä ulkoinen rahoitus nähtiin haasteina. Täten ne koettiin kierrätysprojektien onnistunutta toimeenpanoa mahdollisesti hidastaviksi tekijöiksi. Toisaalta tulokset osoittavat myös, että käsitys kierrätystaloudesta ja sitoutuminen yhdessä kierrätystaloustiedon ja -koulutuksen kanssa nähtiin mahdollisuuksina. Täten ne koettiin kierrätysprojektien onnistunutta toimeenpanoa mahdollisesti tukeviksi tekijöiksi.</p>	
Asiasanat kierrätys, PK-yritykset, kierrätysprojektit, kierrätystalouden toimeenpano	
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LIST OF ABBREVIATIONS

CE - Circular Economy

DfD - Design for Disassembly

DfE - Design for Environment

DfR - Design for Recycling

DfRe - Design for Remanufacturing and Reuse

EC - European Commission

EIP - Eco-Industrial Park

EMS - Environmental Management System

EOL - End-of-Life

EU - European Union

IS - Industrial Symbiosis

LCA - Life Cycle Assessment

MSME - Micro, Small and Medium Enterprises

OECD - Organization for Economic Cooperation and Development

PLC - Product Life Cycle

PRO - Producer Responsibility Organization

PSS - Product Service-System

R&D - Research & Development

SDS - Sustainable Design Strategies

SME - Small and Medium-sized Enterprise

WTE - Waste-to-Energy

3R's - Reduce, Reuse, Recycle

9R's - Reduce, Reuse, Recycle, Refuse, Repair, Refurbish, Remanufacture,
Repurpose, Recover energy

1 INTRODUCTION

1.1 Background

In recent years Circular Economy (CE) has received worldwide and growing attention as a concept that could provide a better and more sustainable alternative for the dominant linear economic development model (Ghisellini et al., 2016). The currently dominant economic development model relies heavily on resource-intensive and unsustainable material flow of extraction, production, consumption and waste (Ness, 2008). Even though, overwhelming number of studies (e.g. Yuan et al., 2008; Ellen MacArthur Foundation, 2013; Ghisellini et al., 2016; Sarja et al., 2021) suggest that this way of business-as-usual is detrimental to the stability of our economies and the integrity of natural ecosystems. By contrast, CE proposes a closed-loop alternative which by definition seeks to minimise the generation of waste and to maintain the value of materials, resources, and goods for as long as possible by circulating them back into the product cycle at the end of their use (European Commission, n.d.). Hence, presenting a far more sustainable and resource-efficient alternative.

According to Sitra (2019) CE could offer organizations the possibility to address the untapped value potential by turning inefficiencies in linear value chains into business value. Similarly, Park et al., (2010) suggest that by incorporating environmental practices into business operations companies could potentially gain competitive advantage, as well as, more integrated environmental and business value creation. Therefore, it could be argued that integrating CE into business operations could potentially result in a win-win situation for both organizational performance and the well-being of the environment. Despite this potential, the worldwide implementation of CE is only still at its early stages (Ghisellini et al., 2016).

Although CE can be quite easily perceived as a rather novel concept, a considerable amount of literature has been published in the field of CE implementation (e.g. Yuan et al., 2008; Kalmykova et al., 2018; Prieto-Sandoval et al., 2018; Ormazabal et al., 2018; Khan et al., 2021) during the past few decades. Especially noteworthy is the high publication record of CE research focused exclusively on issues in China, that might be a result of China's national CE strategy that was approved in January 2009 (Lieder & Rashid, 2016). Previous studies have, however, rarely dealt with an exclusive focus on CE project implementation at micro-level and organizational expectations for their implementation. Sarja et al. (2021) even suggest that the project nature of micro-level CE implementation is overlooked in the current CE literature. Making the project perspective vastly interesting for research. Furthermore, the importance of micro-level implementation is stressed by European Commission (EC) (2019) as they state that Small and Medium-Sized Enterprises (SMEs) are at the very core of CE transition. This makes for a rather sensible statement as SMEs make up to

95% of all companies in Organization for Economic Cooperation and Development (OECD) countries, and 99% of all companies in the European Union (EU) (Filipe et al., 2016; OECD, 2017). Therefore, having also a significant environmental impact and important influence in global CE transition (Ormazabal et al., 2018). Consequently, this research aims to examine CE through existing literature and empirical research by focusing on organizational expectations, impediments and opportunities of CE projects in micro, small and medium-sized enterprises (MSMEs).

1.2 Research objectives and structure

The principal objective of this research is to identify what are the primary expectations that Finnish MSMEs, operating in various industries, have for CE project implementation. Also, the thesis aims to find out to what factors are perceived as impediments regarding CE project implementation, and what factors are perceived as the opportunities regarding the implementation. Consequently the research questions are:

1. What are the primary expectations for circular economy project implementation in Finnish micro, small and medium enterprises?
2. What are perceived as impediments of circular economy project implementation in Finnish micro, small and medium enterprises?
3. What are perceived as opportunities of circular economy project implementation in Finnish micro, small and medium enterprises?

Additionally, the researcher is interested to examine how the organizations involved in the research measure (in case they do) the CE project implementation and its success. Also, the researcher is interested to examine whether the organizations have set goals to enhance the CE and sustainability within the organizations. Exploring this could be considered as the secondary objective of the thesis. Lastly, as there is a lack of extensive literature regarding implementation of CE at project level, the researcher is interested to reflect to which extent the perceived impediments and opportunities of CE projects match with those introduced in existing literature regarding the micro-level implementation of CE.

Finally, the thesis is structured as follows: Section 2 (Theoretical framework) serves to familiarize the reader with existing literature of CE and project implementation and to introduce key concepts related to the research. Section 3 (Data and Methodology) discusses in detail the methodological choices that were made during this study, the data gathering process, and possible limitations to the data. Also, in Section 3 the reliability of the data and the validity of the study is evaluated. Section 4 (Research findings) discusses the results derived from the data analysis. Section 5 (Discussion) reflects the research findings in relation to

the literature review, previously presented in Section 2. Section 6 (Conclusions) summarizes the findings of the research and concludes the study. Also, in this section, further research suggestions are introduced and final acknowledgments are made regarding the research. Finally, the last Section (Appendix) of the thesis introduces the interview frame that was used in the data gathering process of this thesis.

2 THEORETICAL FRAMEWORK

This section will present the theoretical framework of this thesis. The first chapter will discuss the concept of CE by presenting the core principles embedded in the concept, as well as, define what is meant by CE in the context of this thesis. Also, the roots of, contemporarily understood, CE will be examined and the common principles among related sustainability concepts discussed. The second chapter focuses on the implementation of CE, hence discussing the levels of implementation with a particular focus on micro-level implementation methods and project implementation of CE. Besides, discussing implementation, the chapter intends to shed light on possible business model opportunities that arise from micro-level implementation of CE. Lastly chapter three, will examine the implementation by discussing opportunities, impediments and ambivalences of CE implementation at the micro-level.

2.1 Concept of circular economy

This section intends to introduce the concept of CE in a three-fold manner. The first chapter introduces the most prominent definitions of CE and the definition that is used within the context of this thesis. Also, it serves to present the main features related to concept of CE. The second chapter introduces the historical roots of CE, as it is contemporarily understood. The third and last chapter discusses the common principles of CE among the varying approaches presented in the literature.

2.1.1 Defining circular economy

This chapter intends to present the reader with an introduction to the concept of CE, as well as, introduce prominent definitions of CE and discuss the related concepts. Despite the common usage of the term circular economy, there is a lack of consensus on a single agreed definition (Kalmykova et al., 2018). Instead, several definitions of CE have been proposed in the literature. For instance, Kirchherr et al. (2017) alone have gathered and analysed a set of 114 varying definitions of CE in their study. Hence, one might even encounter terminological confusion while researching the topic. However, commonly used definitions include e.g. one from Ellen McArthur Foundation (2012) and one from Prieto-Sandoval et al. (2018). The first one describes CE as:

“an industrial system that is restorative or regenerative by intention and design. It replaces the ‘end-of-life’ concept with restoration, shift towards the use of renewable energy, eliminates the use of toxic chemical, which impair reuse, and aims for the elimination of waste through the superior design of materials, products, systems, and, within this, business models.” (Ellen MacArthur Foundation, 2013, p.7)

Whereas, the latter one describes CE as:

“an economic system that represents a change of paradigm in the way that human society is interrelated with nature and aims to prevent the depletion of resources, close energy and materials loops, and facilitate sustainable development through its implementation at the micro (enterprises and consumers), meso (economic agents integrated in symbiosis) and macro (city, regions and governments) levels. Attaining this circular model requires cyclical and regenerative environmental innovations in the way society legislates, produces and consumes.” (Prieto-Sandoval et al., 2018, p. 610)

Ellen MacArthur Foundation’s definition of CE has even been described as the most prominent definition by Geissdoerfer et al. (2017). Albeit, one would be more cautious with such a statement. Nevertheless, both definitions bring up valid remarks and common principles, such as recirculation of resources, minimization of resource demand, and waste and energy recovery. Thus considering both economic and environmental aspects. A noteworthy difference between the definitions is that where Ellen MacArthur Foundation (2013) describes CE as an industrial system, Prieto-Sandoval et al. (2018) describes it as an economic system. In this thesis, CE is understood through the latter definition composed by Prieto-Sandoval et al. (2018). Since, the latter definition also includes the following components, in addition to the aforementioned common principles: (i) importance as a path for sustainable development, (ii) close relation to the way society innovates, and (iii) multi-level approach (Prieto-Sandoval et al. (2018). Especially, the generally agreed multi-level approach could be seen as a central component to this thesis, as it considers implementation of CE at micro-level i.e. in MSMEs.

CE represents a system-wide shift that produces abiding resilience, provides societal and environmental benefits, and spawn’s economic opportunities. Instead of, simply reducing the undesired impacts of neo-classical, or linear economic development model (Ellen MacArthur Foundation, n.d.). Therefore, presenting an opportunity to reinvent the economy, making it more sustainable and competitive than the current economic development model (European Commission, n.d.). CE is generally portrayed as a circle that depicts the recirculation of resources. This often consists of four steps from which first is to take resources or extract resources from the environment. The second step is to transform the resources into products and services. After which, the third step is the distribution and use of the transformed goods, which can be done by individual consumers or i.e. other companies. The final, and fourth, step is where CE proposes to close the loop by returning goods back into the cycle to be further used as material and energy in other value chains (Ellen MacArthur Foundation, 2013; Prieto-Sandoval et al., 2018; Ormazabal et al., 2018). Additionally, Ellen MacArthur (2013) foundation suggests that the concept of CE is based on three principles namely: “(i) design out waste and pollution, (ii) keep products and materials in use, and (iii) regenerate natural system”. These principles could be seen to extend the aforementioned four steps.

Instead of illustrating CE as a cycle Ellen MacArthur foundation (n.d) presents CE in the form of, what can only be described as, a butterfly (Fig 1.) This form of presenting CE distinguishes two separate flows: The technical and the biological nutrient-based flow of resources.

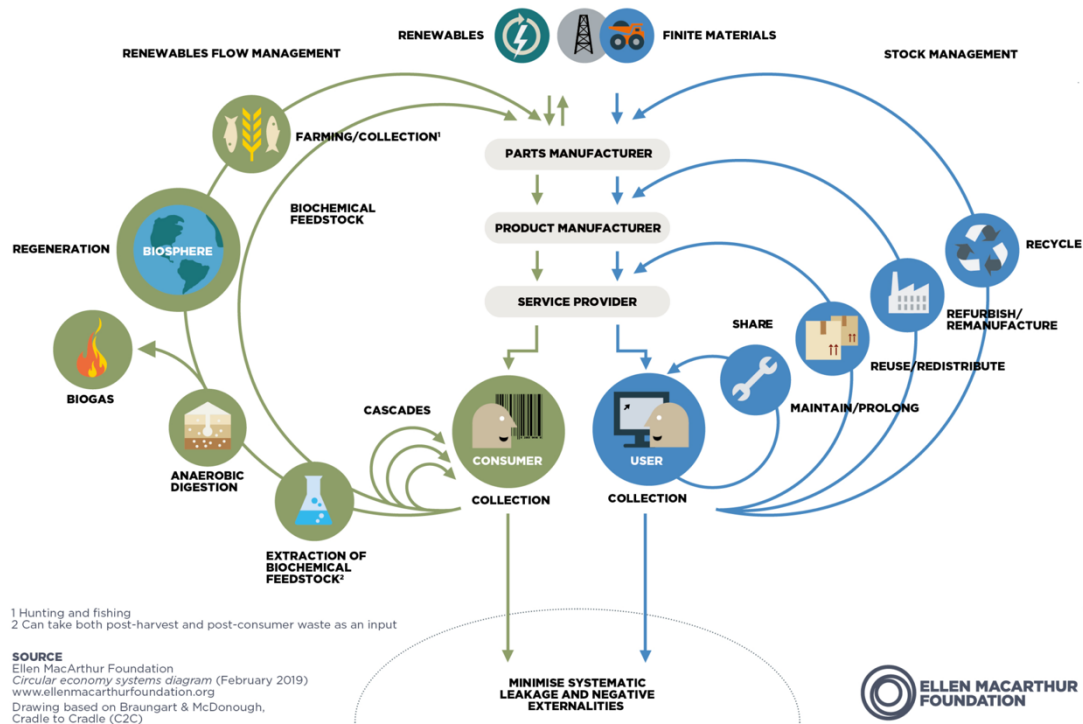


Figure 1. Circular economy systems diagram ® (Ellen MacArthur Foundation, n.d.)

The CE systems diagram intends to capture the flow of technical materials and nutrient-based biological resources while adding an element of financial value (Ellen MacArthur Foundation, n.d.). Furthermore, one might suggest that CE aims to build social and natural capital in the process as well. Nevertheless, on one hand, the left side of the diagram illustrates those resources that can safely re-enter the natural world, eventually biodegrading and re-entering the environment as nutrients. Whereas, on the other hand, the right side of the diagram illustrates those resources that cannot safely re-enter the environment, and therefore must cycle continuously so that their value can be captured time after time (Ellen MacArthur Foundation, n.d.). Albeit being a rather detailed and comprehensive illustration of CE, it fails to visualise the different generally accepted levels of CE. These levels of CE will be further discussed in the Chapter 2.2.1.

2.1.2 Roots and related concepts

This chapter discusses the roots of CE and introduces common principles among the different schools of thought. Ellen MacArthur Foundation's diagram (Fig 1.),

as well as, the whole concept of CE builds on other already well-established concepts (Kalmykova et al., 2018; Ellen MacArthur Foundation, n.d.). For example, Ellen MacArthur Foundation (n.d.) notes that their diagram is most notably influenced by cradle-to-cradle's two material cycles. Kalmykova et al. (2018) suggest that CE draws from concepts, such as spaceman economy by Boulding (1966), limits to growth by Meadows et al. (1972), cradle-to-cradle by Stahel and Reday-Mulvey (1981), industrial ecology by Frosch and Gallopoulos (1989), steady-state economy by Daly (2005), and performance economy by Stahel (2010), among others.

Considering the roots of the concepts from which CE derives, it can hardly be considered as a novel concept as one might first think. Some authors even suggest that CE, or at least the notion of circularity, can be dated as far back as 1758 when François Quesnay set out the concept of a circular flow of income in his book "Tableau Economique" (Murray et al., 2017; Reike et al., 2018). However, the concept of CE and its practical applications to modern economic systems and industrial processes have been gaining momentum only since the 1970s (Geissdoerfer et al., 2017; Reike et al., 2018; Ellen MacArthur Foundation, n.d.). Gradually evolving into the concept of CE, as is contemporarily understood, by incorporating various contributions and different aspects from a variety of concepts, i.e. aforementioned concepts, that share the idea of closed loops.

2.1.3 Common principles

Although, CE field is diverged by various approaches and derived from numerous different sustainability concepts, Kalmykova et al. (2018) suggest that common principles can be identified among the approaches. These principles are namely: stock optimization, eco-efficiency, waste prevention, and 3R's.

Stock optimization refers to augmenting the value of resources at use. For instance, Wijkman & Skånberg (2015, p. 5) can be seen to express stock optimization in their definition of CE by stating that "*rather than discarding products before the value is fully utilized, we should use and re-use them*". Furthermore, numerous similar references to stock optimization can be found in CE literature. As a principle stock optimization is derived from the recognition that Earth's resources are limited, which is also the fundamental acknowledgment in many well-established, and aforementioned, sustainability concepts (Kalmykova et al., 2018).

Similarly, eco-efficiency can be seen as a central aspect and a common principle among diverging approaches, although the emphasis appears to vary according to approach. Since, some consider it as the main purpose and synonymous to CE (e.g. Wijkman & Skånberg, 2015), whereas other approaches consider it as merely one of several consequences of CE (e.g. Ellen MacArthur Foundation, 2013). Despite the varying emphasis, eco-efficiency refers to minimization (toxicity, velocity & volume) and dematerialization of the material flow system (Kalmykova et al., 2018).

Waste prevention is also an often presented principle and a common approach to many sustainability concepts. Likewise to stock optimization, waste prevention can also be seen to stem from the acknowledgment of Earth's finite

capacity to assimilate pollution (Kalmykova et al., 2018). Some approaches even consider waste prevention as the core purpose of CE (Government of People's Republic of China, 2008; Kalmykova et al., 2018).

Finally, according to Kalmykova et al. (2018), the 3R's are yet another shared principle among different CE approaches, that strive to achieve stock optimization and waste prevention. The 3R's are environmental strategies that include reducing, reusing, and recycling. The 3R's are widely cited and by some even referred to as a general term for CE (Government of People's Republic of China, 2008). Although the R's are very recognized in the literature as such, I would be cautious of generalizing it as CE as it may lead to oversimplifying the concept. It should be noted, that in addition to the most known 3R's other extended versions exist as well. For example, van Buren et al. (2016) have listed all-together 9R's, which include: refuse, repair, refurbish, remanufacture, repurpose, and recover energy, in addition to the aforementioned 3R's.

Lastly, it should be noted that there are also differences among the different approaches to CE. For instance, the extent of circularity and the suggested scope of CE may differ according to approach. Therefore, one approach might include only resources from one sector, whereas other approach might include resources at all levels.

2.2 Circular economy implementation

This section intends to scrutinize the CE implementation in a two-fold manner. The overall focus is on the micro-level implementation methods and on business model opportunities that CE withholds. However, the first chapter will first introduce the different scales of CE implementation. After which, the second chapter, focuses on the micro-level implementation in detail. By discussing possible actions and implementation methods in different stages of the CE value chain, as well as by considering some of the business model opportunities that arise from the micro-level CE implementation.

2.2.1 Scales of implementation

This chapter introduces the different scales of CE implementation by briefly explaining the main aspects that constitute each different level of implementation. Generally, there seems to be a consensus within literature that suggest that CE is characterized by a three-layer approach to implementation (Yuan et al., 2008; Prieto-Sandoval et al., 2018). Therefore, implementation of CE can be examined in three distinct levels, namely: micro-, meso-, and macro-level.

First, the micro-level refers to development and improvements that are being done at the enterprise level or consumer level (Prieto-Sandoval et al., 2018.) Therefore, considering improvements that take place within organizations. These improvements can be, for instance, eco-innovation processes, reduction of resource consumption, and designing more environmentally sustainable products.

This implementation level is also the key focus area of this thesis, as it can be considered to withhold CE projects that are being scrutinized in this research.

At the meso, or second level, the primary objective is to develop an eco-industrial network (Yuan et al., 2008). In other words, the meso-level aims to encourage industrial symbiosis (IS), in which organizations form eco-industrial parks (EIP's) and networks that benefit the natural environment, as well as, the regional economy (Geng et al., 2011). Meso-level implementation includes approaches such as cascading, sharing of local infrastructure, and exchange of by-products among other measures (Yuan et al., 2008).

Lastly, the macro-level or third level is focused on national-level implementation through the development of institutional influence and pro-environmental policies (Prieto-Sandoval et al., 2018). It promotes sustainable development, as well as, pro-environmental consumption activities by aiming to create a recycling-oriented society through the development of eco-cities, eco-municipalities, or eco-provinces (Geng et al., 2011; Prieto-Sandoval et al., 2018). Finally, despite the focus of this thesis, all three levels should be considered equally important. Since, they all include the development of resource recovering enterprises and public facilities that support the realization of CE (Yuan et al., 2008).

2.2.2 Micro-level implementation methods of CE

This chapter aims to shed light on available micro-level implementation practices and methods of CE throughout the CE value chain. Implementation of CE in organizations is often closely related to other environmental management practices that companies might engage in, as these practices can also be seen as a pathway towards CE and sustainability (Ormazaba et al., 2018). The actual process of CE implementation in organizations is often an incremental and rather complex process that requires, in many cases, organizational change (Ritzén & Sandström, 2017; Ormazaba et al., 2018; Khan et al., 2021). For companies born under the CE paradigm, e.g., many cleantech start-up's, sustainability might be inherent. However, this is rarely the case with companies founded on the linear economy. Particularly the large and well-established organizations are often slow to start implementing CE due to organizational inertia and resistance towards radical transformation (Lahti et al., 2018). Interestingly, many organizations still undertake processes that account for and favour the implementation of CE, although they do not necessarily link them to the concept of CE (Rizos et al., 2016; Prieto-Sandoval et al., 2018). Instead, they are involved in such projects due to alternative reasons, such as gaining cost reductions, without acknowledging what linear or circular economy even is. Nevertheless, many organizations also do acknowledge what CE is, and purposefully strive towards implementing it through different methods and projects.

Although, no specific guidance for estimating the level of CE implementation exist within the literature, atleast regarding the efforts of individual companies (Prieto-Sandoval et al., 2018). The central methods of micro-level implementation can still be scrutinized through the four steps, previously introduced in chapter 2.1.1, of CE. The four steps consist from stages:

(i) take, (ii) make, (iii) distribute & use, and (iv) recover, that depict the resource flow in CE value chain. Besides authors (e.g. Ellen MacArthur Foundation, 2013; Prieto-Sandoval et al., 2018; Ormazabal et al., 2018) suggesting the allocation to simplified four steps, Kalmykova et al. (2018) have discussed the implementation methods throughout the CE value chain in nine different stages. These stages are: (1) material sourcing, (2) design, (3) manufacturing, (4) distribute & sales, (5) consumption & use, (6),collection & disposal, (7) recycling & recovery, (8) remanufacture, (9) and circular inputs (Kalmykova et al., 2018). Overall, the four steps can be seen to depict the same CE value chain than the nine steps discussed by Kalmykova et al. (2018), although in a rather simplified manner, see Figure 2. This thesis discusses the implementation methods through the four steps, however, acknowledging that the steps consist from various elements and hence can also be allocated into additional steps. Nevertheless, all these value chain stages, whether divided into four or nine step, present companies with an opportunity to take various strategies to engage in projects that account for CE implementation at the micro-level.

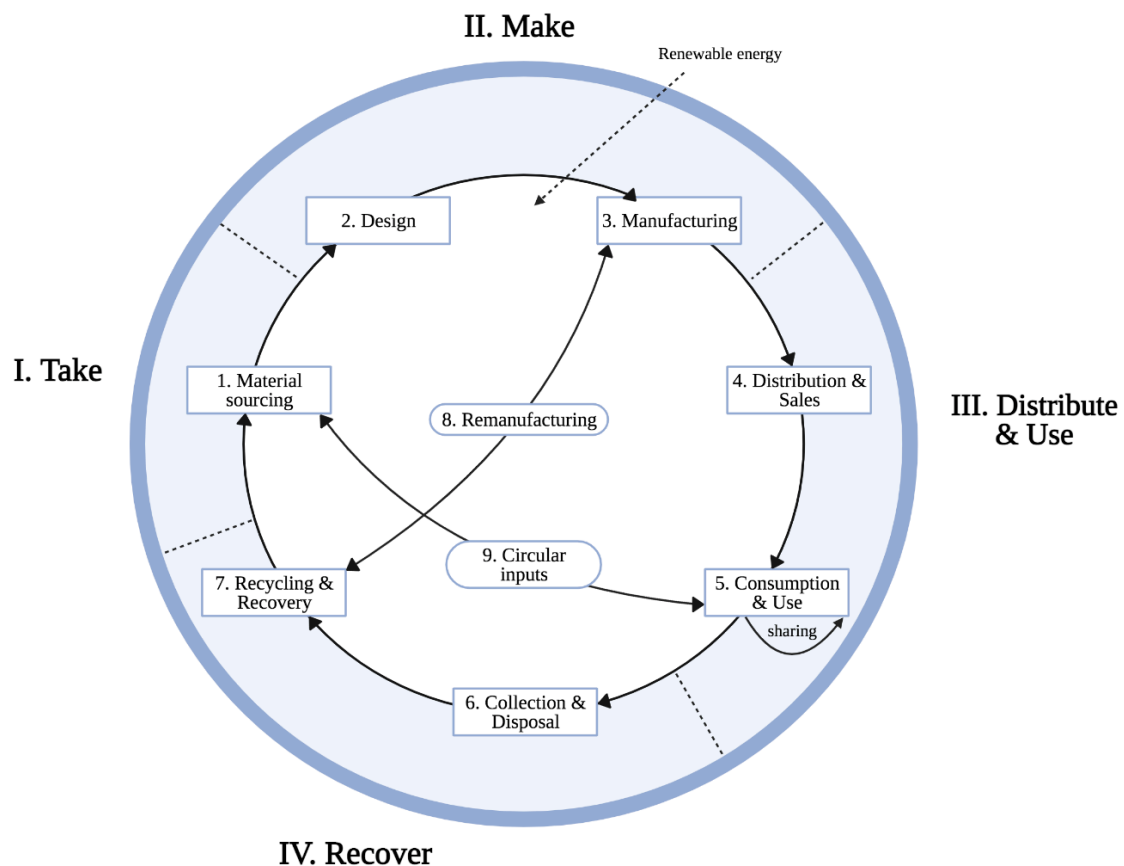


Figure 2. Resource flow through circular economy value chain. Relationship between four and nine steps of the CE value chain. Nine steps adapted from Kalmykova et al. (2018).

In the taking part, that consist of, i.e., resource extraction and material sourcing, of the CE value chain, companies can take implementation methods such as selecting biodegradable or recirculatable materials over materials that are not (Prieto-Sandoval et al., 2018). For example, companies could do a life cycle assessment-based (LCA) evaluation of materials, goods, or services that they intend to use, which allows them to choose resources, or services that inherently have the intended function with lower environmental impact. LCA allows companies to do a standardized and structured evaluation that quantifies all relevant emissions, environmental and health impacts, and consumed resources associated with any goods or services (EC, 2010; Kalmykova et al., 2018), which means that companies have the possibility to use environmental criteria while choosing potential supplier and materials (Prieto-Sandoval et al., 2018). Besides using virgin materials, companies can also engage in CE by using other companies' waste streams (or their own) and by turning old goods into new resources or products. Hence, benefiting from a business model that arises from CE by acting as a “decomposer” of old goods. This is a fundamental component of CE. For instance, Stahel (2016) suggests that CE business models consist of two separate groups: those that operate around extending life through repair, remanufacture, reuse, upgrade; and those that operate around recycling materials by turning goods at the end of their use into new resources, or goods. Furthermore, the taking stage implementation methods include switching to sustainable energy sources regarding production, material extraction & sourcing, and reducing overall resource use where possible.

In the making part of the value chain, companies have arguably even more options regarding CE implementation, as the part considers design aspects and manufacturing processes. According to a study conducted by Prieto-Sandoval et al. (2018), eco-innovation in the design of sustainable services and products is an essential feature of CE implementation in firms. They stress that sustainable design strategies (SDS) have critical implications throughout a product's lifecycle and throughout the CE value chain. SDS could be seen to include many design approaches and opportunities to implementing CE such as eco-design, biomimicry, cradle-to-cradle, design for recycling (DfR), design for remanufacturing and reuse (DfRe), design for disassembly (DfD), and design for environment (DfE), among other approaches (Urbinati et al., 2017; Prieto-Sandoval et al., 2018). Through such SDS, companies can, for instance, extend their products' life cycle, decrease the environmental burden of their products, and allow their products to be easily reused, remanufactured, or recycled by themselves or by other companies. Some SDS may also increase customer loyalty and prevent over-production. For instance, Kalmykova et al. (2018) suggest that by customization and tailor-making products, companies could better meet the needs and preferences of the customers while simultaneously reducing waste. Adding that customer loyalty is built-in, in the sense that satisfied customers could return to the manufacturer to extend the service life of the product and keep their desired features.

Besides design aspects, manufacturing processes present many opportunities for CE implementation at the micro-level. Companies can, for

instance, reduce the environmental burden of their manufacturing processes by internal closed-loop manufacturing processes (e.g., recycling own production waste), using best available practices, increasing energy efficiency and material productivity, and by adapting transparent and scalable production technology (Park et al., 2010; Kalmykova et al., 2018). For example, making manufacturing processes transparent and easily reproducible allows the companies production technology to be easily replicated in other regions using only indigenously available resources (Kalmykova et al., 2018). Hence, a company could expand its operations to other regions with decreased environmental impact and most likely decreased investment- and other affiliated costs. Similarly, efforts in increasing material productivity and energy efficiency could allow companies to gain economic value with decreased material and energy input.

The distribution & use stage considers matters and methods related to distribution and sales and consumption and use. First, the distribution and sales could include implementation approaches such as building a sustainable logistics system, optimizing package design, and reselling and redistributing products (Prieto-Sandoval et al., 2018; Kalmykova et al., 2018). For instance, by optimizing transportation routes of the sold goods, companies could reduce their negative environmental impact and gain cost reduction due to decreased fuel consumption. Similarly, efficient packaging design could reduce the material need of packaging, increase reusability, and decrease the overall size of the package. Thus companies could transport an increased number of packages per freight while minimizing material use of packaging and increasing the reusability and recyclability of the packaging.

Furthermore, companies can engage in resale activities to extend the product life through secondhand use (Kalmykova et al., 2018). The complete products or individual components could be resold where possible. Hence, decreasing the need to produce products that would serve the same purpose as the existing product. The consumption and use phase also offers various approaches that companies can take to implement CE in their operations. For as soon as the goods and services are purchased by other companies or consumers, CE should go on to propose the reduction of the negative environmental impact affiliated with the use phase of the products or services (Stahel, 2016; Prieto-Sandoval et al., 2018). According to Prieto-Sandoval et al. (2018), companies have basically two ways to approach this. First, companies could innovate their business model in a way the customers could return the products after use so that companies can extend the products lifecycle through after-sale services and maintenance activities. Second, they could promote a product service-system model (PSS) or product as a service approach. Hence, shifting towards offering customers the use of tangible products instead of owning them and providing maintenance and repair services throughout the products' lifetime (Prieto-Sandoval et al., 2018; Kalmykova et al., 2018). According to EC (2014), many business opportunities for SMEs are likely to emerge from the PSS approach and business models based on leasing, sharing, repairing, upgrading, or recycling products and individual components. Additionally, companies could design their products to work with sustainable energies, engage with stakeholders to

provide repair, recycling, and replacement guidance, use eco-labeling, and virtualize their products, among other things that could ease the environmental burden of the consumption and use phase. (Prieto-Sandoval et al., 2018; Kalmykova et al., 2018).

Finally, the recovery stage considers collection and disposal, as well as recycle and recovery activities. The implementation methods include, but are not limited to, building channels to communicate and retrieve used products from customers, recovery actions and industrial recirculation of materials, downcycling, by-product use, and energy recovery (Prieto-Sandoval et al., 2018; Kalmykova et al., 2018). For example, by downcycling, companies could convert the used and priorly recovered products and components into new products of lower quality or functionality (Kalmykova et al., 2018). In case downcycling is not possible, companies could also consider converting waste to usable energy through different waste-to-energy (WTE) processes where possible. Companies could also utilize the by-products of their own or others in manufacturing processes to make new products. Therefore, taking concrete implementation measures in closing the loop.

Lastly, besides the stages mentioned above, IS should be mentioned due to its significance in CE implementation. Prieto-Sandoval et al. (2018) state that such industrial metabolism is required and essential for successful CE transition and to close the loops throughout different value chains. Further stating that particularly in SMEs' case, IS helps to build competitive advantage and support environmental innovation through a collaborative atmosphere. IS includes the physical exchange of, for instance, materials, by-streams, and waste that others may use as raw material or in WTE processes. Besides sharing materials, it could include sharing infrastructure with "industrial neighbours" (Prieto-Sandoval et al., 2018). It could be that neighbors symbiosis might enable remanufacturing processes and circular inputs that would be otherwise unachievable. Finally, the implementation methods introduced in this chapter should not be viewed as an exhaustive listing. Instead, they present some examples of methods and projects in which SMEs can improve their business's circularity based on existing literature. These aforementioned methods are summarized in Table 1, which is related to the previously introduced Figure 2.

Table 1. Summary of available implementation methods based on existing CE literature. Table in relation to Fig.2. Adapted from Kalmykova et al. (2018) and Prieto-Sandoval et al. (2018).

CE Value chain stages	Example implementation methods	References
I. Take 1. Material sourcing	- LCA & Supplier audits - Use of renewable energy - Sourcing of sustainable materials	Kalmykova et al., (2018), Prieto-Sandoval et al., (2018)
II. Make 2. Design 3. Manufacturing	- SDS & Eco-innovation: e.g. DfR, DfE, etc. - Product/Service customization - Increasing energy efficiency & material productivity - Reproducible & adaptable manufacturing	Kalmykova et al., (2018), Prieto-Sandoval et al., (2018), Urbinati et al., (2017,) Park et al., (2010)
III. Distribute & Use 4. Distribution and sales 5. Consumption and use	- Optimized package design - Sustainable logistic system - Product as a service and PSS - Re-sell and redistribute	Kalmykova et al., (2018), Prieto-Sandoval et al., (2018), EC, (2014)
IV. Recover 6. Collection and disposal 7. Recycle and recovery	- WTE - Building "take-back" systems - Recirculation of materials - Utilizing by-products - Downcycling	Kalmykova et al., (2018), Prieto-Sandoval et al., (2018)
Industrial Symbiosis 8. Remanufacture 9. Circular inputs	- Sharing infrastructure - Utilizing by-products/waste streams of others - Creating joint value	Kalmykova et al., (2018), Prieto-Sandoval et al., (2018)

2.3 Opportunities and impediments of CE implementation

This section will discuss the opportunities and challenges related to CE implementation, with a focus on relevant factors to micro-level implementation processes. Hence, the chapter intends to shed light on internal and external factors that either hinder or support CE's successful implementation in organizations. This section also considers ambivalent factors that can either hinder or support CE implementation, depending on the context. A summary of these categories is presented in Table 2, at the end of Chapter 2.3.3. Furthermore, while this section

introduces the most critical opportunities, impediments, and ambivalences regarding micro-level implementation and this thesis, it should be noted that it is not exhaustive, and other themes also exist within CE literature.

2.3.1 Opportunities of CE implementation

This chapter examines categories of opportunities that support successful CE implementation of CE. In this context, the term opportunity refers to favourable circumstances for the achievement of CE. In other words, it refers to any factor that may support the successful implementation of CE. The researcher has categorized three different supporting themes from the existing literature, namely: expected financial benefits, expected other benefits, and coping with changing business environment. These supporting (or hindering) factors can be further broadly categorized into two sections, internal and external factors (Govindan & Hasanagic, 2018). The internal level considers factors, stakeholders, and actions that relate to things that are done within the enterprises and may impact the organization. Whereas, external level considers those that are done outside the enterprise. Furthermore, other and more complex categorizations have also been suggested throughout CE literature (Agyemang et al., 2019).

One of the most obvious reasons why companies pursue CE is the expected financial benefits such as cost reduction through resource efficiency, increased competitive advantage through sustainability, and a possibility to expand to new markets. To elaborate, companies could, for instance, turn their waste streams into raw materials for their products, thus creating cost reductions from waste management where possible (Sarja et al., 2021). Companies could also potentially utilize their waste stream by selling waste to “decomposer” companies that could utilize waste as raw material, thus creating additional revenue. Since the waste of one company could be a raw material of another. Several authors (e.g. Rizos et al., 2016; Prieto-Sandoval et al. 2018; Sarja et al., 2021) suggest that these expected economic benefits can be seen as a catalyst towards CE transition and therefore supporting factor for the implementation of CE in organisations. This is only sensible as many organizations would likely strive to increase profitability and competitiveness, even if it would not simultaneously decrease their environmental burden, which CE is suggested to do (Sarja et al., 2021). In addition to economic company-specific benefits, Rizos et al. (2016) and Cooper & Hammond (2018) suggest that implementing CE also has positive economic outcomes beyond the organizational level. As CE may increase job creation, improve productivity, and mitigate exposure to the market and supply-chain risks. These potential economic benefits are related to both internal and external factors.

Another opportunity of CE implementation that can be seen to support CE transition is other expected benefits. These expectations include factors such as strengthening of customer relationships, increase in the prestige of the company’s image due to improved sustainability, and increase in the company’s business and environmental performance (Ormazabal et al., 2018; Lahti et al., 2018; Agyemang et al., 2019). One could also argue that this category could

include increased employee satisfaction, as many young professionals are now more demanding of their employers, and many expect corporate sustainability engagement of some sort. The rationale behind these factors is that by implementing CE, organizations can, for instance, achieve better and longer relationships with their customers (Lahti et al., 2018). A company could also appear as a more favorable option to new customers and employees due to a greener brand image. These expectations could also be considered to derive from both internal and external influences.

Finally, one would define the last category of opportunities that may influence CE transition positively as ‘coping with changing business environment’. As EC (2019 p. 10) states that “*the circular economy is now an irreversible, global megatrend*”, it is only natural for companies to adapt somehow. Consequently, this category is more or less related to risk management towards doing business as usual, which acts to support CE transition in organizations. According to Franco (2017), numerous organizations have come to realize that the linear economic development model leaves them exposed to increased risk through volatility in resource prices and vulnerable to supply restrictions, among other risks. Therefore, leaving managers in an increased need to manage market turbulence through the implementation of CE business models (Lahti et al., 2018). This is an internal and external influence that might push companies towards CE implementation.

2.3.2 Impediments of CE implementation

This chapter focuses on impediments of successful CE implementation. In this context, impediments refer to factors that may hinder or obstruct the successful implementation of CE at the micro-level. Similar to opportunities, impediments have also been categorized into three themes based on the existing CE literature. These themes are identified as short-term vision, lack of resources, and uncertainty.

The first impediment is short-term vision. It is an internal factor that may obstruct CE implementation in organizations. A study conducted by Ormazabal et al. (2018) suggests that SMEs are still focused mainly on only necessary legal requirements, systematization, and cost savings in their environmental management practices. Implying that although SMEs engage in environmental management practices, they do not necessarily perceive CE as one of their priorities. Furthermore, a shift towards a circular business model may require high advance investments and a longer time horizon for revenue generation, which may not suit a company or its shareholders with a short-term vision (Lahti et al., 2018). When the implementation of CE is not viewed as a priority, and the potential opportunities are overlooked, CE implementation is less likely to get the human and financial resources that it may require in order to be successful (Lieder & Rashid, 2016).

The second and perhaps the most conspicuous impediment is the lack of resources. This is an internal factor since it refers to the financial capital and human-based resources available within the organization for CE implementation.

As stated in the previous chapter, CE implementation could require, in some cases, significant financial investments, as well as time and effort, which without the CE transition is not possible. For instance, Agyemang et al. (2018) note that unlike with conventional linear material flow, some stages of CE implementation may call for significant investments to be made by a company to achieve circularity. An example of such a stage could be developing a closed-loop infrastructure and a take-back system. Besides direct financial investments, Rizos et al. (2016) point out that extra effort in developing sustainable services and goods can often translate into additional indirect costs related to research & development (R&D), such as time and money spent by human resources. Consequently, organizations' insufficient financial resources or limited human-based resources may well hinder the implementation of CE.

Finally, the third and last impediment is uncertainty. This can be seen both as an external and internal factor since it refers to uncertainty regarding the organization's external environment and uncertainty within the organization. Companies face numerous risks due to uncertainties surrounding CE. According to Lahti et al. (2018 p. 4) these risks include *"experiencing high unforeseen contracting costs because they [companies] are unable to contract partners, lack the competence to formulate contracts that are detailed enough to secure their interests, or enter into contracts with too much complexity because they cannot visualize the challenges they will face during the transition"*. Consequently, where companies consider CE's implementation too expensive and risky, the actions towards CE implementation are not taken (Lahti et al. 2018). Hence, risk aversion due to uncertainty and the logic of taking small safe steps in organizational development can be seen as obstructing factor towards CE transition (Ritzén & Sandström, 2017). Companies can also be reluctant to implement CE because they are not entirely convinced of the potential future benefits of implementation, such as cost or material savings (Ormazabal et al. 2018). In the end, uncertainty regarding return on investment, other benefits, lack of reference point, and inability to visualize CE implementation's future potential may leave companies hesitant to implement CE practices. Therefore, hindering the CE transition within companies.

2.3.3 Ambivalent factors

Besides opportunities and impediments, there are also factors that may either hinder or support CE implementation in organizations depending on the prevailing circumstances or given context. Therefore, either obstructing or catalyzing CE transition. Sarja et al. (2021) named these factors in their study, quite fittingly, as ambivalences due to their varied nature. This chapter intends to discuss these so-called ambivalent factors based on existing literature. Five different themes have been categorized from existing literature, which one considers relevant and ambivalent regarding the micro-level implementation of CE. These themes are, namely: customers and demand, legislative environment, managerial commitment and existing management systems, existing knowledge, and finally, design and technical aspects. Like the previously presented opportunities and impediments, these themes can also be divided into external and internal factors.

The first ambivalent theme regarding CE implementation is customers and demand. This theme has a dual role as customers tend to value and demand different things instead of having homogenous needs. For instance, on one hand, Sarja et al. (2021) suggest that there is an indisputable customer interest, at least in some customer segments, towards more environmentally friendly and sustainable options. Thus, possibly acting as an incentive for companies to implement CE. This, of course, refers to the mainstreaming of sustainability and it becoming a global megatrend, as previously stated. On the other hand, Scheepens et al. (2016 p. 259) note that customers "*the customers' perceived value is related to the perception of the product by an individual buyer at the moment of purchase (i.e., the expected fun and use after the purchase) and in the use phase thereafter (which can lead to either increased satisfaction or dissatisfaction).*" Implying that customers may, in many cases, prioritize other things, e.g., lower price over the sustainability of the product (and often increased cost). Furthermore, Ranta et al. (2018) suggest that contemporary customer preferences still favor using new products over reusing existing products. Hence, customers and demand can also act as a barrier towards CE implementation.

The second ambivalent theme is the legislative environment. This is purely an external factor that considers legislative environments' dual impact on CE implementation. For instance, Govindan & Hasanagic (2018) note that while governments can make laws that promote cleaner production, end-of-life (EOL) management, and product take-back that support or even mandate adaption of CE principles at the micro-level. Governments might also have existing environmental laws that do not fit the CE concepts in some systems, thus hindering CE implementation. Furthermore, the legislative environment can also create circumstances that either encourage or discourage CE transition through tax incentives. Overall, the legislative environment makes for an interesting factor since it has an undeniable impact on all scales of CE implementation, whether it is micro-, meso-, or macro-level.

The third ambivalent theme is managerial commitment and existing management systems. This is an internal factor that has a significant impact on a company's ability to implement CE practices. For instance, Lahti et al. (2018) and Govindan & Hasanagic (2018) both state that support from management is imperative to enhancing CE implementation practices. Besides commitment, the researchers highlight the importance of top managers' creativity and capacity to shift toward CE business models. This is a sensible argument since often, particularly in SMEs, the structural alignment decisions are solely in the hands of top management (Lahti et al., 2018). Therefore, the lack of managerial commitment, creativity, or capacity can also heavily obstruct the implementation and the shift towards CE. Like managerial commitment, environmental management systems (EMS) can also impact a company's ability to implement CE. As mentioned in Chapter 2.2.2, CE implementation is often heavily related to other environmental management practices that a company might engage in. Hence, it is only natural that existing EMS might support CE implementation at the micro-level, whereas lack of EMS might hinder it. The suggestions regarding the impact of EMS are heavily based on the framework that EMS provides for companies. For instance,

companies may benefit from existing EMS since it helps organizations maximize their material productivity and energy efficiency and implement standardized environmental indicators, among other things (Sarja et al., 2021). Practices that also account for supporting CE implementation. Nevertheless, Sarja et al. (2018) argue that while existing EMS may support a company in CE transition, it still requires additional support from top management to give direction and clarity for the company's strive towards CE.

The fourth ambivalent theme is existing knowledge. This is an internal factor that refers to CE-related knowledge and learning that exist within an organization. Knowledge is not necessarily a necessity in the sense that many companies undertake actions that account for CE implementation without actually acknowledging it, as previously explained in Chapter 2.2.2. However, existing knowledge has an undisputed ability to support CE transition. For instance, Sarja et al. (2021) suggest that for companies to participate in CE projects, they should have knowledge about similar, successful projects and the required technology since gaining CE-specific knowledge likely favors effective CE implementation. This is rather an agreeable suggestion, as it is only logical that companies who possess an existing knowledge of CE and are agile to learn are likely to be better prepared to implement CE projects than those who are not. The lack of relevant knowledge is also highlighted by researchers (e.g. Adams et al., 2017; Agyemang et al., 2018) as hindering factor. A shortage in expertise or detail technical knowledge could act as a bottleneck for successful CE implementation. For instance, remanufacturing products after take-back requires significant amount of expertise and technical knowledge as the process intends to redesign or restore the product in original or better condition (Linder & Williander, 2017). Lack of such technical expertise and know-how will likely hamper the company's ability to implement CE practices.

The fifth and final ambivalent theme is the design and technical aspects. This theme deals with internal factors that impact a company's CE implementation either by supporting or hindering it, depending on the context. Sarja et al. (2021) state that technology and design aspects can support CE implementation in various ways throughout the product lifecycle (PLC). Arguing that while further technological solutions are needed, many current technologies are already able to execute supporting processes regarding CE implementation. For instance, digital technologies can significantly help in sustainable product design, increasing product lifespan, and EOL solutions (Sarja et al., 2021). Correspondingly, Cooper and Hammond (2018) suggested that if producers design their products to be easily recyclable, the consumers are more likely to recycle them. Hence, supporting the take-back part of PLC and CE overall. Urbinati et al. (2017) also stress the supporting properties of design aspects by suggesting that practices such as DfRe, DfR, DfD, DfE allow companies to extend the lifespan of products, use less resources, and to better maintain the value of the product throughout the PLC. Despite these opportunities, many authors (e.g. Pan et al., 2015; Agyemang et al., 2018; Govindan & Hasanagic, 2018) also note that shortcomings in design and technical aspects may hinder CE implementation. Pan et al. (2015) go as far

as to list technical aspects as one of the most challenging barriers for organizations to overcome, as eliminating them requires comprehensive and integrated strategies. Whereas Govindan & Hasanagic (2018) state that complex and inadmissible product design may become a significant challenge for remanufacturers and recyclers. Thus, possibly hindering successful CE implementation. Finally, Table 2 aims to summarize all the opportunities, ambivalences, and impediments discussed within the Section 2.3.

Table 2. Summary of opportunities, ambivalences, and impediments with literature references.

Category	Theme	Internal/ External	References
Opportunities	Expected financial benefits	Both	Sarja et al. (2021), Ormazabal et al. (2018), Rizos et al. (2016), Agyemang et al. (2019)
	Expected other benefits	Both	Ormazabal et al. (2018), Lahti et al. (2018), Agyemang et al. (2019)
	Coping with changing business environment	Both	Lahti et al. (2018), Sarja et al. (2021), Franco (2017)
Ambivalences	Customers and demand	External	Sarja et al. (2021), Agyemang et al. (2019), Scheepens et al. (2016), Ranta et al. (2018)
	Legislative environment	External	Govindan & Hasanagic (2018), Sarja et al. (2021)
	Managerial commitment	Internal	Govindan & Hasanagic (2018), Sarja et al. (2021), Lahti et al. (2018), Agyemang et al. (2019)
	Existing knowledge	Internal	Adams et al. (2017), Sarja et al. (2021), Agyemang et al. (2019), Linder & Williander (2017)
	Design and technical aspects	Internal	Govindan & Hasanagic (2018), Sarja et al. (2021), Agyemang et al. (2019), Pan et al. (2015), Urbinati et al. (2017), Cooper & Hammond (2018)
Impediments	Short-term vision	Internal	Ormazabal et al. (2018), Lahti et al. (2018), Lieder & Rashid (2016)
	Lack of resources	Internal	Lahti et al. (2018), Govindan & Hasanagic (2018), Sarja et al. (2021), Rizos et al. (2016), Agyemang et al. (2019), (EC, 2014)
	Uncertainty	Both	Lahti et al. (2018), Franco (2017), Ritzén & Sandström (2017)

3 DATA AND METHODOLOGY

This section presents the research methodology of the thesis in a four-fold manner. The first chapter intends to briefly describe the chosen research design & strategy and why it was chosen for this study. The second chapter describes the data collection process in detail by explaining the different steps from selecting the data collection method to conducting interviews. The third chapter discusses and illustrates the method of analysing the data. The fourth and the last chapter sheds light on possible limitations related to the data or the chosen methodology by discussing the reliability and validity of the study.

3.1 Research design & strategy

The thesis process began with an idea to explore the CE project implementation in Finnish MSMEs. As previously mentioned in the introduction of this thesis, a recent study by Sarja et al. (2021) have suggested that the project perspective of CE implementation is somewhat overlooked in the current literature, implying that a possible research gap exists. Consequently, partially due to the researcher's personal interest and partially due to lack of existing research on the topic, the researcher deemed the topic as a justified subject to research and dig further into.

The first methodological choice within the thesis was to decide on a suitable research method for the study. The decision was made between qualitative research design and quantitative research design. According to Saunders et al. (2019), qualitative research is focused on developing a conceptual framework and a theoretical contribution by studying meanings and relationships derived from words and images. In contrast, quantitative research is focused on examining relationships of different variables by applying numerical, statistical, and graphical techniques. Equivalently, Eriksson & Kovalainen (2008) state that where the quantitative approach concerns testing hypotheses, providing explanations, and conducting statistical analysis, many qualitative approaches focus on understanding and interpretation and aim to formulate a holistic understanding of the studied issue. They further stress that qualitative research can be particularly relevant when the prior understanding of the phenomenon under scrutiny is limited.

Furthermore, according to Eriksson & Kovalainen (2008), there are two primary research inquiry models: induction and deduction. On one hand, the deduction is based on a principle where existing theory is the first source of knowledge. From existing theory, a researcher can deduce hypotheses that can then be subjected to empirical study. By testing the hypotheses through empirical examination, a researcher can potentially gain certainty in theory development. This is a linear process, which in its strict form is not suitable for qualitative business research (Eriksson & Kovalainen, 2008). On the other hand, induction draws from empirical materials, such as observed cases, statements, and claims, not

from existing theoretical propositions. Hence, proceeding from empirical research to theoretical results, viewing theories as outcomes of empirical research. Eriksson and Kovalainen (2008) state that induction in its pure form is also very rare and most studies involve both deductive and inductive reasoning processes at some point within one study. Hence, identifying and making strict classifications between the two can be difficult.

Since this thesis aims to gain a holistic understanding of expectations, impediments, and opportunities related to CE project implementation in Finnish MSMEs, a qualitative research design was perceived as an appropriate method for the thesis. Additionally, due to a lack of existing research focusing on CE project-level implementation, acquiring sufficient information by quantitative approach would be unobtainable or at least very arduous. Furthermore, this research can be seen to lean towards inductive reasoning since this thesis does not pursue to test hypotheses derived from existing theory. Nevertheless, it should be noted that some characteristics of deductive reasoning also apply to this thesis since this thesis started with a literature review exploring themes related to this thesis. However, it serves to acquaint the researcher and the reader with the phenomena under scrutiny rather than to serve as a foundation for hypotheses.

3.2 Data collection process

Prior to deciding a suitable data collection method, one should first recognize the purpose and the nature of the research (Saunders et al., 2019). The purpose of this thesis is to examine what Finnish MSMEs perceive as impediments and opportunities of CE project implementation, and explore what are the primary expectations for such projects. As this thesis's primary purpose is to gain insight and clarify understanding of CE project implementation in Finnish MSMEs, the thesis can be seen as an exploratory study. According to Saunders et al. (2019), there are multiple ways to conduct exploratory research, however, the most common methods include conducting a search of the literature and interviewing 'experts' in the subject. Consequently, both of these methods were chosen for this thesis, with interviews being the method of collecting the primary data. Interviews were chosen for the data collection method since they can be particularly helpful in gathering data when dealing with complex topics or when open-ended questions are required to gain relevant data (Hair et al., 2015). Also, exploring the research problems of this thesis in an insightful manner requires probing the underlying reasons of how possible challenges and opportunities emerge. Hence, interviews were deemed as an appropriate method for the primary data collection.

There are multiple types of research interviews that vary from being unstructured to highly structured (Hair et al., 2015). These types include, for instance, structured interviews, semistructured interviews, and in-depth interviews. Besides varying in structure, interviews may also vary in size and in the way they are conducted. As a flagrant example, a semistructured interview could be a one-on-one interview conducted face-to-face, or it could also be a focus

group interview, with many interviewees participating at the same time conducted via an online platform. What matters, according to Saunders et al. (2019), is that the interview type is consistent with the research questions, objectives, purpose, and the research strategy that the researcher has adopted. In order to be aligned with the purpose and strategy of this thesis, the researcher chose to use semistructured interviews for collecting primary data. Semistructured interviews were deemed appropriate for this thesis as they allow the researcher also to exercise his own initiative and flexibility (Hair et al. 2015). They provide the researcher with an opportunity to 'probe' responses with further questions, where the researcher wants the interviewee to clarify an answer or build on it (Saunders et al., 2019). Probing is an essential tool when a researcher aims to understand the causal relationship between variables or where it is necessary to understand reasons for answers, opinions, or attitudes. Consequently, semistructured interviews are often affiliated with exploratory studies.

Another vital aspect to consider while conducting semistructured interviews is the expertise and knowledge of the participants. The quality of the data is directly tied to the quality of the contributions from those who participate in the interviews (Saunders et al., 2019). In other words, an interviewee who is well aware of the subject under scrutiny is more likely to give insightful opinions and answer that translate into quality data than an interviewee who has no prior knowledge of the subject. In order to ensure the quality of the data in this thesis, the researcher chose to do semistructured one-on-one interviews with 'experts' that either are or have been in a central role in implementing CE projects in Finnish MSMEs. Meaning that the interviewees currently are, or have previously participated in, organizing, planning, or implementing CE-related projects in their current or former organization. Finding such willing experts for the interviews was a surprisingly arduous process, which is reflected in the number of interviewees secured for the purpose of this thesis.

Nevertheless, at the time of the preliminary search for interviewees, the researcher was gladly able to gain access to a business network, which was participating in a 'circular economy business model -training' that was safeguarded by Sitra, and organized as part of CICAT25 project. By contacting the host of the training, the researcher was given an opportunity to pitch the thesis's idea to the MSMEs involved in the training. After pitching the topic of the thesis and after further persistent persuading via email, and extending the search of suitable MSMEs to other networks, the researcher was able to schedule a sufficient amount of interviews for primary data collection. All and all eight suitable interviewees agreed to be interviewed from a total of six different organizations. The preliminary aspiration was to gain several interviewees from a single organization and therefore gain more participants and varied perceptions to enrich the dataset. However, in many cases, the secured interviewee was alone in charge of CE-related matters in the organization due to the small size of the organization. Therefore other personnel within the organization were incapable of providing insight and quality data for this thesis. Other organizations were also persistently persuaded to participate in the research. However, due to lack of time or interest, they either declined or did not respond to the inquiry to be interviewed.

The secured interviews were held via Zoom -video communications platform due to varying geographical locations between the interviewees and the researcher. Also, due to health-related safety measures, as COVID-19 pandemic was prevailing at the time of the interviews. The size and the maturity of the participating companies were different from one another, which allowed the researcher to gain rich data and identify possible differences between these variables. However, all companies that participated in the research were MSMEs, whose number of employees ranged between 4 and 40. The interviewees were either managers, founders, or CE specialists within these companies. The interviewees' roles and the details of the interviews are further illustrated in Table 3. Albeit there were differences between the companies, the unifying factor among the companies was that they had previously implemented, or were implementing, at the time of the interviews, projects or a project that accounted for enhancing CE within these organizations.

Table 3. Description of the interviewees

No.	Company	Interviewee	Duration of the interview (min)
1	Company A	CEO	26 min
2	Company B	CEO & Founder	25 min
3	Company C	Service manager	60 min
4	Company D	CEO	55 min
5	Company E	Sustainability manager	45 min
6	Company F	CE specialist (Former chairman of the board)	36 min
7	Company F	CE Specialist (Former CEO)	57 min
8	Company F	CEO & Founder	60 min

The interviews were conducted between the 1st and 17th of March 2021. Prior to the interviews, the researcher explained the privacy policy concerning the interviews, ensuring the participants that no personal or identifiable data will be distributed during the process. With permission from each individual interviewee, the researcher recorded each interview to be later transcribed. All, except one, interviews were conducted in Finnish. One interview was conducted in English as it was the native language of the interviewee. Conducting interviews in the native language of the respondent was done to ensure that the respondent would be equally capable of expressing his or her opinions, thoughts, and views verbally. The decision to conduct interviews in the native language of the respondent was also done to create a pleasant and relaxed atmosphere, which according to Hair et al. (2015), is a must in ensuring the cooperation of the interviewee, and thus obtainment of quality data. As most of the interviews were conducted in Finnish, the majority of the interview extracts used in this thesis are translations from Finnish to English done by the researcher. While

acknowledging that the researcher is not a professional translator, the translations were done to the best of the researcher's abilities in a manner that retained the original meaning of the extract in the most accurate way possible.

The interview outline, presented in Appendix 1, consisted of three main parts. The first part of the interview, and the outline, considered the background information of the company and the interviewee and the sustainability and circular economy within the organization. The purpose of this part was to gain an understanding of how the company deals with CE and sustainability in general. Also, the first part aided the researcher in gaining a more holistic understanding of the company's business operations and how respondents perceive CE and sustainability. The second and perhaps the most important part of the interview, and the interview outline, consider the research questions of this research and the nature of the projects. Therefore, focusing on project level implementation of CE by exploring the interviewees' expectations and the perceived impediments and opportunities identified by the interviewees. Finally, the third part of the interview, and the interview outline, consider measuring these projects by looking into indicators and project monitoring.

3.3 Data analysis

This thesis applied thematic analysis as its method for analysing data. According to Braun & Clarke (2008), the thematic analysis should be viewed as a foundational method for qualitative analysis. It is a widely used method, which is often considered as a common approach to qualitative analysis (Braun & Clarke, 2008; Saunders et al., 2019). The fundamental purpose of thematic analysis is to identify, analyse and report patterns (or themes) from a previously collected data set (Braun & Clarke, 2008). The data set could consist of various items, such as documents, interviews, observations, or websites. In principle, the intention is to organize complex data into themes that describe the data in a detailed manner and allow further analysis. There are many ways to go about performing thematic analysis. This thesis followed the four-step approach outlined by Saunders et al. (2019). They outlined four distinct steps for thematic analysis, namely: (1) Becoming familiar with the data, (2) coding your data, (3) searching for themes and recognising relationships, and (4) refining themes and testing propositions.

Getting familiar with the data is potentially the most laborious part of the thematic analysis, at least if one does the transcribing by him or herself. However, it is also one of the most important parts of the thematic analysis, as it serves as a foundation for the whole analysis. Consequently, Braun & Clarke (2008) describe immersing oneself with all aspects of the data as a vital part of thematic analysis. As part of this thesis, the word-to-word transcribing of the interviews was done by the researcher, which served to ensure familiarity with the collected data. Besides doing the transcribing process, the researcher re-read the transcripts on multiple occasions throughout the project and made notes to fully understand the underlying meanings within the data.

After the familiarity of the data was ensured, the researcher moved to code the data. Coding is a process of assigning values or names to each unit of data within a data set with a code that represents or summarises the extract's meaning (Saunders et al., 2019). According to Hair et al. (2015), the purpose of coding is to comprise a small number of relevant and representative data from a larger amount of undifferentiated data. Therefore, enabling the researcher to focus only on the relevant and significant characteristics within the data. By fragmenting the larger data into codes, a researcher can easily comprise groups from codes with similar meanings and examine them in relation to other groups (Saunders et al., 2019). The code in itself can be, for instance, a single word or a short phrase that identifies an interesting feature of the data. (Braun & Clarke, 2008; Saunders et al., 2019). In this thesis, the number of assigned codes per each transcribed interview varied between 26 and 84. The total amount of codes was 378, which was reduced down to 232 after grouping only relevant codes to this thesis. Many of the assigned codes appeared in most of the transcribed interviews and had similar meanings, while some applied to only one or a few of the transcribed interviews.

After coding was done, 20 different themes were formed from the basis of the codes. However, out of the 20 initially identified themes, only 12 themes were deemed relevant, through a refining process, to the research questions of this thesis. Saunders et al. (2019) define themes as broad categories that withhold several codes related to each other and indicate an idea relevant to your research question. Searching for such themes requires immersing oneself with the data and the priorly assigned codes. The coding process and the process of forming themes and categorizing them are further illustrated in Figure 3.

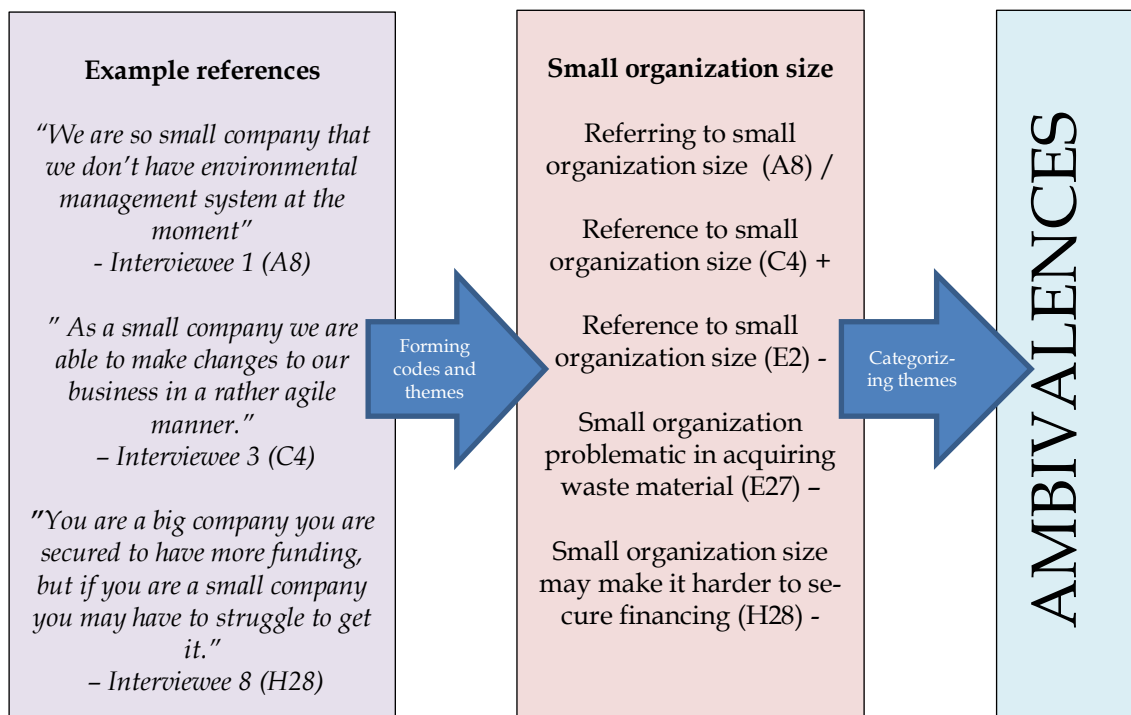


Figure 3. Illustration of coding process, theme forming, and categorizing (/ Neutral statement, + Positive statement, - Negative statement)

The 12 themes that emerged as an outcome of the thematic analysis were further categorized into four categories. The four categories were determined based on previous literature introduced in the literature review of this thesis. The categories are also in direct relation to the research questions of this thesis. The four categories are illustrated in Figure 4, along with the 12 themes identified through thematic analysis. The themes were relatively evenly divided between the categories. However, majority of the themes were either related to impediments, expectations, or ambivalences of project level CE implementation in Finnish MSMEs.

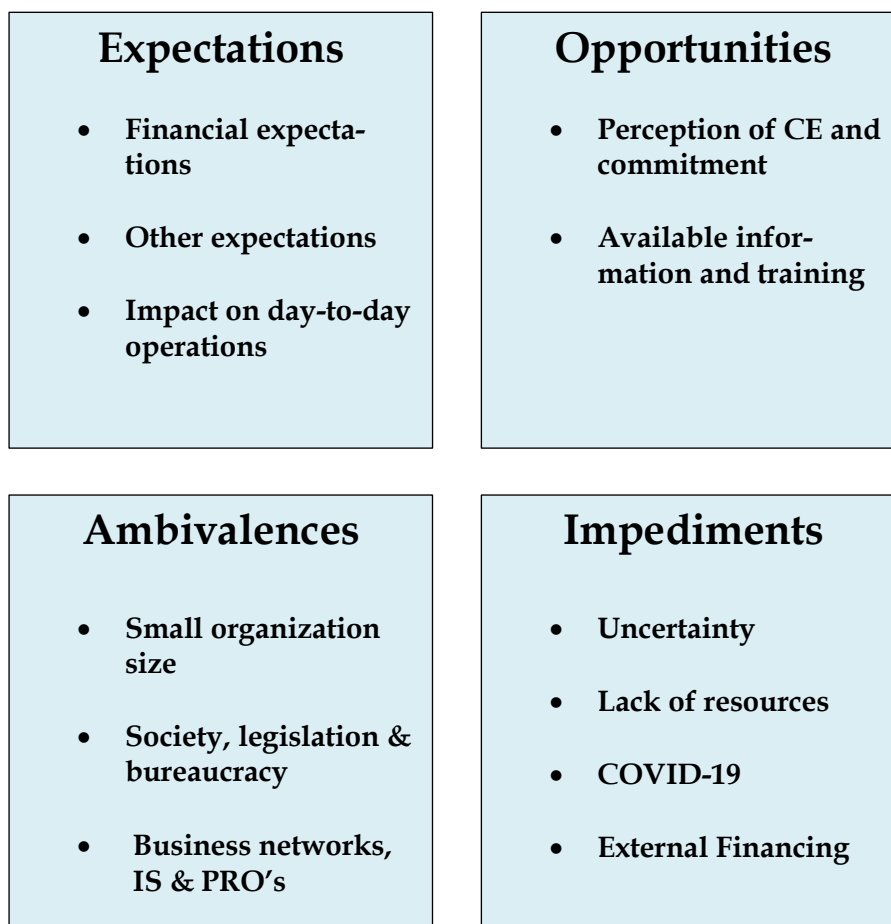


Figure 4. Illustration of themes and categories

3.4 Validity, reliability & limitations

Throughout this thesis project, the researcher has taken many steps to minimize possible limitations or biases related to the study. The researcher has pursued ensuring the immaculate quality of the data and trustworthiness of the research by concerning matters related to reliability (or credibility) and validity (or dependability) of the study. The terminology related to reliability and validity is somewhat contested in the context of qualitative research (Saunders et al., 2019). As some scholars argue that since the terminology is born under quantitative tradition, it has little value for qualitative inquiry (Guest et al., 2012). Consequently, many alternative terms have been created to assess similar aspects of a qualitative study as a consequence of this school of thought. For instance, an alternative terminology related to validity of a study includes terms such as trustworthiness, confirmable, representative, legitimacy, and credibility, among others. Similarly, alternative terminology exists for examining the reliability of a study, including dependability as perhaps the most commonly employed term (Guest et al., 2012). Due to the contested nature of terminology, this research will consider the concept of validity through credibility and the concept of reliability through the dependability of the study. According to Tolley et al. (2016, p. 51-52), credibility focuses on *“confidence in the truth of the findings, including accurate understanding of the context”*, whereas dependability focuses on the consistency of the study, which increases when *“the process is consistent and carried out with careful attention to the rules and convention of qualitative study”*.

The researcher has aimed to ensure the credibility of this thesis by doing thorough documentation of the research process, as described in this Section of the thesis. Furthermore, the methodology of the thesis has been chosen on the basis of suitability regarding research questions. The methodological decisions made in this thesis have been carefully rationalized throughout the thesis project. Prior to the data collection, the researcher also did thorough research regarding the implementation of CE within SMEs, which can be seen in Section 2 of this thesis, to ensure sufficient knowledge of the topic before conducting interviews. The interviewees were selected with consideration to getting diverse, and most of all, suitable and knowledgeable sample to provide quality data for the analysis. Furthermore, during the interviews, the researcher pursued creating a relaxed atmosphere and, to his best abilities, avoided questions, gestures, and expressions that could compromise the study's unbiased nature.

With concerns to the dependability of the study, the researcher has followed good research ethics throughout the project. While this has been a solo project of the researcher, a supervisor has been appointed to observe that a germane manner of conducting research is followed by the University of Jyväskylä. The supervisor has commented the project throughout its motion, which can be seen to increase the dependability of the study.

Finally, this thesis is not without its limitations. The most obvious limitation of this thesis is the relatively small and rather industry-wise fragmented

sample of interviewees, which means that the results of the study cannot be generalized as such. However, according to Saunders et al. (2019), the results of qualitative research are not necessarily intended to be replicated in the first place, but rather they are intended to reflect the socially constructed interpretations of the participants in the given time and setting. This is also the purpose of this thesis, instead of aiming to provide replicable results. Furthermore, the varied nature of the implemented CE projects among the participating companies may impact the results. Therefore, the relation between the nature of the project and perceived expectations, impediments, and opportunities should be further studied. Also, as pointed out in Section 3.2, the researcher is not a professional translator or transcriber. Hence, the quality of the translations and transcripts may not be of immaculate nature. However, they were done according to the best of the abilities of the researcher. Lastly, this thesis considers the implementation of CE projects only in the context of Finnish MSMEs, and therefore the study should not be subjected to interpretation outside the Finnish context.

4 RESEARCH FINDINGS

This section presents the research findings by examining the four previously identified categories individually and the themes within them. Also, this section presents the secondary research findings related to setting goals and measuring the success of CE projects. The findings are examined in the order of relation to the research questions. Therefore, the first chapter will discuss findings categorized under expectations which are related to research question one. The second chapter will discuss the findings categorized under impediments which are related to research question two. The third will discuss ambivalences, which are related to both research questions two and three. The fourth chapter will discuss findings categorized under opportunities related to research question three. Finally, the fifth and the last chapter will discuss the findings related to settings goals and measuring CE projects, which could be considered as a secondary objective of the thesis.

4.1 Perceived expectations of CE projects

This chapter describes findings related to the expectations of project-level implementation of CE in the Finnish MSMEs interviewed for this thesis. Three themes were categorized under the expectations. The first chapter will discuss findings related to a theme identified as financial expectations. The second chapter will introduce findings related to a theme named other expectations. The third chapter will introduce findings regarding the theme identified as the impact on day-to-day operations.

4.1.1 Financial expectations

In many cases, the expectations that the interviewees described for the CE projects were of financial nature. Meaning that by engaging in projects that enhanced CE within the organization, the interviewees expected to gain financial benefits in the form of profits or in the form of cost savings. In most cases, the financial benefits were discussed from the company's point of view. However, one interviewee also implied that also personal financial expectations are seen as expectations for such projects.

"...of course we are not doing this for free, we have high profit expectations. But, of course, the one who invests in the factory demands it."

– Interviewee 6

Besides expecting a direct financial return on investment and a possible increase in the company's profitability, some interviewees also described indirect financial benefits in cost savings as expectations for engaging in CE projects. For

example, engaging in projects that reduced companies' energy use was expected to result in cost savings.

“The expectations that we have set are mostly related to savings through energy use, or energy use in general. That is our primary target. If we have new-build building investments we want to settle the level where it is [energy consumption] going to end.”

– Interviewee 1

4.1.2 Other expectations

Besides having direct and indirect financial expectations for the implementation of CE projects, most of the interviewees described other expectations as well. These other expectations are possible expected benefits that are not of financial nature. Instead, the other expectations are related to gaining improved brand image, increased customer relationship & satisfaction, gaining forerunner status in the industry, and increasing the circularity of the company's own business operations. These themes came up in most of the interviews in one form or another. Many participants were seemingly aware that engaging in CE projects does not necessarily result in financial profits, but instead, the results can be seen in other forms. Although, acknowledging that it may take time for those benefits to become visible or concrete.

“we have noticed that the repair service is not necessarily a profitable function for us, it is a zero sum game. Instead, the benefit that we get from there is more related to increasing our visibility, customer relationships, and brand image.”

– Interviewee 5

Particularly the importance of maintaining customer satisfaction and delivering customer promises was emphasized among the interviews. Although some participants considered financial gain as their primary expectation for implementing CE projects, they emphasized that it is not to be pursued at the expense of customer satisfaction. Besides having expectations related to customer relationships or brand image, many companies simply wanted to improve the circularity of their own business and the company's sustainability. Suggesting that they participated in the projects with environmental aspects in mind, even though, in some cases, it was not the primary expectation of the projects. By engaging in projects that enhanced the organization's circularity, some participants also expected to be distinguished as a pioneer or a forerunner among their industry. Thus, positively differentiating themselves from the competitors.

4.1.3 Impact on day-to-day operations

While all participants viewed circular economy and sustainability to be an integral part of business operations and company values, some even describing sustainability as a transilluminating process of all business functions. Many participants still expected that engaging in CE-enhancing projects does not negatively

impact the company's day-to-day operations. Meaning that pursuing such projects was expected not to harm the quality of the product, customer satisfaction, or other business functions. Pursuing CE projects are to happen at the side of day-to-day operations.

“Our primary purpose of existing is to run production, maintenance, and our own business operations. Therefore, all these development activities and circular economy must happen on the side. They must be fused as part of business operations, otherwise they will remain as one-time experiments.”

- Interviewee 3

Although, as suggested in Chapter 4.1.2, many participants were not necessarily expecting a financial return on investment, many still expected that engaging in CE projects would not bring the company additional costs either. Therefore, engaging in CE projects was expected not to burden the current organization too much. For instance, one interviewee implied that while not all recycling is done with financial return in mind, the process is still expected to pay itself back.

“The raw material prices for copper and aluminium are high at the moment, so we expect that the investment and the extra work would pay itself back. However, glass and plastic is something that we recycle more for ethical reasons, so it could be removed from landfills.”

- Interviewee 4

4.2 Impediments of implementing CE projects

This chapter introduces findings related to perceived impediments of implementing CE projects in Finnish MSMEs. Similarly to the micro-level impediments, discussed in Chapter 2.3.2., the project-level impediments refer to factors that may hinder or obstruct the successful implementation of CE, and more importantly CE projects. The identified impediments consist of four different themes identified based on the interviews. The first chapter will discuss findings related to uncertainty regarding the implementation of CE projects. The second chapter will discuss findings related to a theme identified as a lack of resources. The third chapter will discuss how findings related to COVID-19. Finally, the fourth and the last chapter will discuss findings related to external financing of CE projects.

4.2.1 Uncertainty

Uncertainty was among the most discussed themes, and all interviewees referred to it in one shape or form during the interviews while discussing the implemen-

tation process of CE projects. Interestingly, interviewees themselves did not identify uncertainty as an impediment to CE project implementation. Although, it was evidently described as having a hindering impact on the implementation, if not obstructing impact. As, in some cases, uncertainty translated into increased work in terms of research work and extra piloting during the project. While many of the projects were of varying nature from one another, uncertainty still seemed to be a somewhat prevailing theme, as it was discussed in many different aspects and in all parts of the value chain. Some interviewees described uncertainties related to customer needs regarding their current project, while some were uncertain of the required investments, human resources, material, or even the potential benefits of the project.

“We actually did two pilot tests, then we were able to say that how much this requires from us, for example in human resources. We really had no understanding of this before we set out to do this [project].”

– Interviewee 3

Based on the interviews, it seems that the projects with a degree of novelty to the company are bound to result in uncertainties due to a lack of experience in implementing similar projects. At least if the project itself is a complex one to implement. An example, described by one interviewee, would be establishing a take-back system and reverse logistics. In other words, implementing something for the first time may be more laborious than implementing it for the second time since one has no prior experience of a similar project. An alternative explanation could be a lack of prior knowledge and available information. However, most of the participants described the availability of the CE information to be an opportunity rather than an impediment, as described in Chapter 4.4.2.

4.2.2 Lack of resources

Another impediment described by the interviewees was the lack of resources. This is a theme that is directly related to an ambivalent theme of small organization size, as is described in Chapter 4.3.1. This theme considers primarily the lack of time and human resources described by the interviewees. Although, a lack of financial resources could also be considered as part of this theme. However, due to its significant influence, it is categorized as a theme of its own, discussed separately in Chapter 4.2.4. Nevertheless, most interviewees also described that they have limited time or human resources to pursue the CE project they were currently engaging in. Meaning that either they had a limited amount of people participating in the implementation of the project, and therefore did not have the desired time or human resources, or that implementing the project was not seen as a priority, and therefore no time or human resources were allocated to it.

“We don’t have very much time to dabble around with calculations and Excel for each batch.”

– Interviewee 3

Both of these could be seen as the reasons for having a lack of resources since few interviewees described the projects as laborious and challenging to organize by nature. Thus, possibly requiring more human resources to ease the implementation process. Likewise, all interviewees described that they also had other job functions within the organization in addition to enhancing the given CE projects. Therefore, the project was not necessarily seen as priority number one, resulting in the allocation of time and human resources to other day-to-day activities of the company. After all, as previously mentioned in Chapter 4.1.3, engaging in the CE process was expected not to impact other business operations negatively and, therefore, must happen side by side with the day-to-day operations. Also, it should be mentioned that two interviewees also stated having another job or businesses besides the function at the company that participated in this research. Hence, they were also loyal to another job or a company, which may have influenced the personal prioritization or time allocation of these two interviewees.

4.2.3 COVID-19

At the time of this research, the COVID-19 pandemic was prevailing globally. The interviews of this thesis took place at a time when the Finnish government had imposed restrictions to mitigate the spread of the disease by recommending remote work, limiting face-to-face contacts, and other means. Consequently, COVID-19 was also briefly mentioned by few interviewees due to its very topical nature at the time. They saw it as an impediment for two reasons.

Firstly, COVID-19 was challenging the face-to-face meetings with potential investors and other stakeholders. Thus, possibly hindering access to, for example, raw materials and financing, which were in many cases deemed crucial for the implementation of the CE projects. However, this was only a minor impediment, or rather an inconvenience, as other means of conducting such meetings also exists. Secondly, the COVID-19 was viewed to hinder the implementation of legislation that would improve prerequisites of operations for the companies and the CE projects that they engage in. One interviewee, in particular, emphasized that by focusing solely on COVID-19 related matters, the Finnish government has overlooked its other legislative duties.

“...we were active in making such bill. Unfortunately the COVID-19 has taken away the time and energy of the current government. So these government program entries, that are binding as such, have not been implemented so far.”

– Interviewee 4

4.2.4 External financing

External financing was by far the most discussed impediment during the interviews, and all interviewees mentioned it in one form or another. This can be seen as a major impediment since most interviewees described external financing as a

necessity for engaging in CE projects. Many of the discussed projects required at least some sort of investment; generally, the bigger the project, the bigger the required investment.

“Of course, financing also has its impact. Especially when it comes to fibre recycling, piloting, and launching a new product. Getting external funding for that is mandatory for a company of our size. After all, piloting like this cost thousands of euros and is very expensive in the end.”

– Interviewee 5

Due to the companies investment (in)ability, they had to lean on external financing, at least partially, when engaging in CE projects. This meant either finding a private investor or applying for public funding. Both of these were seen as challenging tasks by the interviewees. One interviewee implied that Finland is missing risk investors for CE projects. Suggesting that there are only two alternatives from which one could apply, either one applies for a bank loan against physical collateral, or one applies for a loan from Finnvera, which was seen to take minor risks against high margin. Other interviewees agreed that finding a private investor is also challenging, however, without being as elaborate about the reasons. Public financing was also seen as equally challenging to achieve, and therefore as a hindrance to the implementation of the CE projects. Few interviewees described applying for public funding as a lengthy and clumsy process, primarily due to strict time schedules for sending applications, lengthy examination periods, and challenges related to finding a suitable public financier.

Even though financing was perceived as a significant impediment by most interviewees, most also agreed that it was not solely a challenge of CE projects. Instead, financing was seen as a challenge for any project that they were engaging in. Interestingly, many interviewees also stated that the increasing reputation of CE could even open better access to finance in comparison to other projects. On the contrary, one interviewee also suggested that the increasing reputation also increases the competition for the funding, thus diminishing the access to finance.

4.3 Ambivalences of implementing CE projects

Besides having straightforward impediments and opportunities related to a CE project's implementation, the interviewees also described hindering and helping factors that are bound to a specific context. These factors are categorized as ambivalences due to their dual nature. Three ambivalent themes were identified based on the analysis. The first ambivalent theme is the small organization size of the participating companies. The second ambivalent theme is society, bureaucracy & legislation. The third and last ambivalent theme is business networks, IS, and producer responsibility organizations (PRO's).

4.3.1 Small organization size

The small organization size was often mentioned aspect during the interviews. This was rather foreseeable as all of the companies within the sample were MSMEs. The context in which the interviewees brought up the small organization size varied. Few interviewees described it to be a disadvantage to the implementation of CE projects, whereas others considered it as an advantage. Thus it is categorized as an ambivalent theme. Small organization size was seen, by few interviewees, to impact negatively the company's ability to secure funding or raw materials for the projects. Moreover, as previously implied in Chapter 4.2.2, many saw it as the cause of having no, or limited amount of, time and human resources for the implementation of the CE projects. Even though not all interviewees saw or identified organization size as a challenge, it became evident during the interviews that it still had an impact on how the interviewees prioritized their time. For example, many interviewees stated having a broad job description due to the small organization size, which may impact their time allocation to advance the CE projects.

*"In [company 1] the job description of a CEO is significantly broader in comparison to a larger company."
– Interviewee 1*

Nevertheless, small organization size was also described to increase the agility of the company. Therefore, possibly helping the implementation of CE projects within the organizations. The companies were generally seen as more able to implement rapid changes to their business functions due to the small organization size. Similarly, one interviewee described the small organization size to positively impact the company's ability to tailor the projects according to the different needs of their business partners. Thus, helping them better fuse the individual projects as part of their daily business functions and meet the individual needs of their stakeholders.

4.3.2 Society, legislation & bureaucracy

Society, legislation & bureaucracy in Finland was another theme that was categorized as ambivalent and therefore bound to the project's context. In most cases, the aspects related to this theme were discussed in the scale of Finland. However, some interviewees also discussed legislation in the scale of EU directives. The Finnish society, legislation, and the degree of bureaucracy were all discussed having both hindering and helping influence on the CE projects of the companies, and nearly all interviewees mentioned them in one way or another.

Few interviewees considered the Finnish society as an opportunity due to its stability and ability to learn, implying that other European countries may be more conservative when implementing CE at the macro-level when compared to Finland. Moreover, Finland was thought of as a geographically prominent loca-

tion for expanding the CE technology to the Nordic countries. Also, most interviewees considered the Finnish and European environmental legislation as sensible, stating that since it is so strict, they do not necessarily have to adjust corporate goals of their own. In fact, most participating companies did not have written goals regarding CE or sustainability because they deemed the external legislative boundaries as sufficient or because they started having an integral and unified vision of how to approach these themes within the organization. Lastly, having good relationships with public servants was described as an opportunity to advancing the CE projects when it came to lobbying beneficial legislations and applying for permits and funding.

On the contrary, having no prior relationship with the public servants was described as an impediment by one interviewee for the same reasons. Also, while most interviewees viewed the current legislation as sensible and as an opportunity, one pointed out that in some cases, the legislations and policies have flaws, and in some cases, they might be contradictory to what is actually pro-environmental. However, the most emphasized hindering aspect, identified by few interviewees, was the bureaucracy related to applying for permits and funding in Finland. For example, the application process of construction and environmental permits was described as clumsy, the examination times was seen as unnecessarily slow, and eventually, the whole process was viewed to contain too many phases, which acts as a hindrance to the implementation of the CE projects.

“It should definitely be more agile! Somehow you would think that it is not so slow. We make everything from recycled materials and have a patented zero pollution -technology. Think about it, it takes three months to get an environmental permit. It could take even four to five months depending on the city and the municipality, and that is only up to 20 000 tons. When you have to apply for a bigger permit it can take up to year and a half. That takes us time, in which we could already produce jobs and money to the society.”

– Interviewee 7

4.3.3 Business networks, IS & PRO's

Another theme in which influence varied according to the context was business networks, IS & PRO's. On the one hand, most interviewees discussed business networks as opportunities by referring to existing logistic, supplier, and partner networks. However, two interviewees extended to discussion to consider IS as well. One stating that it has a positive impact on the organization working in the same area, as it increases the prerequisites of business, allows the use of side flows, and increases the image and self-esteem of the companies working in the area. Nevertheless, it seems that business networking around CE and forming IS is a relatively novel concept in Finland. Therefore, it was perhaps not brought up by the other interviewees as such. However, other forms of partnerships were seen as opportunities for the implementation of the CE project. Because having extensive partnerships enables the companies to dissect their own processes to other companies, thus making their own processes or projects more efficient. In

some cases, the partners were pro-actively described to be engaging in enhancing their circularity and sustainability. Therefore, the companies did not necessarily have to guide or persuade the partners to be aligned with their own environmental policies if they had such policies.

On the other hand, business networks, or rather lack of them, were also described as an impediment to a successful implementation of CE projects. First, ensuring that the partners align with the company's policies and participate in projects was seen as a challenge. For example, one interviewee described that establishing reverse logistics as a part of their project was demanding. Since their partners had different individual facilities and, therefore, did not necessarily have the required space to collect and temporarily store the items that the company wanted. Moreover, the partners had no incentive of their own to collect the items to be resent and repaired at the company. Second, even more, discussed impediment was gaining access to the ecosystem of PRO's, the supply of raw materials, and finding a payer for the recycling activities. While one interviewee expressed a worry of having to operate at a loss due to the PRO's reluctant attitude to bear the financial burden of recycling the materials they have manufactured. Some interviewees described challenges related to gaining access to raw material or a waste stream primarily controlled by PRO's. Expressing that changing the attitudes and the status quo of the PRO's way of working is demanding and hence hinders the advancement of their project. Implying that if you are being considered as a threat to business as usual, you may have a hard time getting partners.

“If somebody has already a monopoly on the [material] and he does not want to give it you, what do you do? You just have to get a crumble from here and there to get your plant running. Because, instead of him seeing you as a potential partner, who is going to process his material in a very innovative and environmental way. He finds you as an attack, because this might wake up a lot of people”

– Interviewee 8

4.4 Opportunities of implementing CE projects

This chapter introduces findings related to perceived opportunities of implementing CE projects in Finnish MSMEs. Similarly to the micro-level opportunities, discussed in chapter 2.3.1, the project-level opportunities refer to favourable circumstances for the achievement of CE. In other words, it refers to any factor that may support the successful implementation of CE, and more importantly CE projects. The identified opportunities consist of two different themes identified based on the interviews. The first theme identified as opportunity is the perception of CE and commitment related to executing CE. The second theme identified as an opportunity is available information and training related to implementing CE.

4.4.1 Perception of CE and commitment

The first theme categorized as an opportunity related to implementing CE projects within the organizations was the internal and external perception of CE and the commitment to execute projects enhancing CE within the organizations. It was evident that all interviewees considered CE as a contemporary topic and as the future direction of business in general. Consequently, many even described CE as an integral part of their operations and company values. The companies' perception of CE seemed to support them in engaging and advancing CE projects. One interviewee stated that investing and developing CE projects has not been a problem, since for them, *"it simply makes sense"*. Another interviewee stated that implementing CE projects has not been a problem for them since the company's management views CE as the way of the future and has, therefore, mentally committed to going through with the project before starting it. Thus, clearly supporting the implementation of their CE projects.

Besides the companies' internal perception and commitment, also external perceptions were discussed during the interviews. Some interviewees noted that the image of their own business area or industry has risen side-by-side with the increasing reputation of sustainability, recycling, and CE. That has resulted in diminishing threats to their business and sparking them with new and improved business opportunities. For instance, through increased access to finance and increased customer need for recycled products or services to extend product life. Consequently, one interviewee stated that there is even greater potential for profitability in implementing CE projects than there is at implementing other projects within their business area.

"I personally see this [CE] as future. All and all, I believe that in everywhere there will be a increasing transition towards circular economy."

- Interviewee 2

4.4.2 Available information and training

The second theme categorized as an opportunity related to implementing CE projects within the organizations was the available CE-related information and training. As briefly mentioned in Chapter 3.2, some of the interviewed companies had priorly taken part in a 'circular economy business models -training' safeguarded by Sitra. Most interviewees brought it up proactively during the interviews, stating that it had helped them get a better understanding of business strategies related to CE. Moreover, many stated that it had helped them expand their network and gave them new insight and practical tools to approach their projects. Although the training was not perceived as a necessity, one interviewee stated that participating in the aforementioned training had accompanied their project further in a faster phase than it would have advanced without such training. Generally, it was perceived that there are training's available if one wants to increase their knowledge of CE. Although not all interviewees took part in the aforementioned training, some still brought up that they had cooperated with

universities and their students to advance their projects and increase their own knowledge.

In addition, few interviewees noted that there is reliable and extensive information available about implementing CE if one knows where to look for it. Most interviewees viewed that having access to such information helped the advancement of CE projects within the organizations. However, it was stated by one interviewee that although there is a lot of information available, it is currently somewhat fragmented and hard to combine and, therefore, hard to apply to the scale and context of one's business. Hence, suggesting that a CE-related information database for MSMEs is needed and that such a database would help the companies better implement their CE-related projects.

"It [the CE training] really raised our awareness a lot. Even though we chose to focus on reuse, we were left with information about other business models and opportunities. In this way, it increased our general awareness of circular economy and that we still have other opportunities here."

– Interviewee 3

4.5 Setting goals and measuring CE projects

This chapter introduces the research findings related to the secondary objective of the thesis, which was to examine whether the companies have set goals to enhance CE and sustainability within their organizations and how the companies measure the achievement of CE projects (if they do).

In most cases, the interviewees stated having no written goals for enhancing CE at the company-level or the project-level, and only a few interviewees stated having written goals for enhancing sustainability within their organization. It became evident through the interviews, that some interviewees viewed having written goals for enhancing CE and sustainability as somewhat unnecessary. Since it was implied, by few interviewees, that there was no need for written goals as the company already had a unified vision of how to approach CE and sustainability within the organization, the organization size was small, or the external legislation was seen as sufficient. Nevertheless, some interviewees also stated that they are considering setting written goals for enhancing CE and sustainability in the future, however, without being elaborate on the nature of the future goals.

"...Finnish business is so strictly regulated that the goals come externally and those are being monitored. We don't have separately written goals exceeding that as our own goals."

– Interviewee 4

Furthermore, the majority of the interviewees described having no specific way to measure the success rate of individual CE projects, at least in terms of how

they impact the company's circularity and sustainability. Instead, in most cases, the impact and success rate of the projects was measured at the company-level and through financial indicators such as cost avoidance or increase in sales. Nevertheless, many interviewees also expressed that it would be useful to expand the measuring to consider individual projects, or that they are already planning to do so in the future. For instance, by measuring the amount of recycled materials.

"Well, principally the measuring happens at the company-level. However, we have also noted that it could also be useful to measure these individual projects and their development."

– Interviewee 5

5 DISCUSSION

This section aims to reflect the research findings of the thesis in relation to the theoretical framework, introduced in Section 2, and the research questions of this thesis. Consequently, the first chapter aims to discuss the findings related to research question one by reflecting the previously introduced literature. Similarly, the second chapter aims to discuss the findings related to both research questions two and three by reflecting on the previously introduced literature. The third chapter will expand the discussion to the importance of networks concerning the implementation of CE projects based on the interviews. The fourth chapter aims to dig slightly deeper by pondering the impact of a project's nature concerning ease of implementation based on the interviews. Finally, the fifth and last chapter will briefly discuss the goal-setting of the companies and their measurement practices based on the interviews.

5.1 Pursuit towards circularity and profitability

The findings of this thesis suggest that there were three different expectations emphasized throughout the interviews, which also served to motivate the participating companies to pursue CE projects within their fields. These were namely financial expectations, other expectations, and impact on day-to-day operations. These identified expectations serve to answer research question number one. Interestingly, the identified expectations, particularly the expected benefits of some sort, can be seen as directly linked to the opportunities of micro-level implementation of CE, discussed in Chapter 3.2.1. The results were somewhat expected to arise from the interviews, although one thought to see them in correlation with research question three, instead of research question one.

Particularly the financial expectations were expected results, as several authors (e.g., Rizos et al., 2016; Prieto-Sandoval et al., 2018; Sarja et al., 2021) have suggested that perceived economic benefits, such as cost savings and increase in profitability, may catalyze companies towards company-level CE transition. Thus, motivating them to pursue CE projects. This is only logical, since most organizations would likely strive to pursue projects that are expected to increase profitability and cost savings, even if it would not increase the circularity of their operations. After all, one could argue that profitability is the backbone of any healthy private organization.

Besides financial expectations, the other expectations described by the interviewees can be seen as aligned with the other benefits described in the literature. For instance, the interviewees described other expectations related to the increase of brand image, customer satisfaction, and status within the industry. While other expectations, presented in the literature, viewed strengthening customer relationships and the increased prestige of the company image as opportunities of micro-level implementation of CE (Ormazabal et al., 2018; Lahti et al.,

2018; Agyemang et al., 2019). These were also somewhat expected results as, according to Lahti et al. (2019), organizations could strengthen their customer relationships through CE implementation. Also, a company could appear as more favourable option to a customer due to a greener company image.

The third expectation or a theme, identified based on the interviews, was not present in the literature. Therefore, it was not expected result as such. However, it raises an interesting point about the expected transaction costs of pursuing circularity at the micro-level. Since the interviewees described that pursuing CE was expected not to compromise any other aspect of day-to-day operations. Yet, at the same time, they described CE to be an integral and even transilluminating process to all operations of a company. It is rather surprising that implementation of CE was expected to happen merely at the side of day-to-day operations, although it was widely perceived as the future way of business in general. While, this expectation is likely related to the limited resources of an MSME to pursue such projects, or the inability to fully visualize the potential of CE. Shouldn't one still be able to make sacrifices to achieve its own goals and values, especially if one describes CE as an in-built value of the company.

5.2 Impediments and opportunities of CE project implementation

The research findings suggest that there were various impediments and opportunities to implementing CE projects within Finnish MSMEs. Also, besides impediments and opportunities, a number of ambivalent themes were identified. These were considered as both impediments and opportunities depending on the context of the company and the project. The ambivalences are, however, discarded from the detailed discussion as they are not directly related to the initial research questions of this thesis. Nevertheless, the key observations related to the identified ambivalent themes are briefly introduced in Chapter 5.3, in addition to the description provided in Chapter 4.3.

Firstly, the research findings suggest that there were four impediments to the project-level implementation of CE. These identified impediments serve to answer research question number two. The impediments were uncertainty, lack of resources, COVID-19, and external financing. These identified project-level impediments were relatively well aligned with the micro-level impediments described in the literature. As an example, Ritzén & Sandström (2017) suggests that uncertainty and logic of incremental and safe development can be seen as obstructing factor to CE transition. While the interviewees did not identify uncertainty as an impediment themselves, they described taking the step-by-step approach of implementing projects due to factors related to uncertainty. In some cases, the interviewees even expressed uncertainty about the need for human resources, material needs, and potential benefits of the project. Which, according to Ormazabal et al. (2018), may hamper the implementation of company-level CE.

Furthermore, the lack of resources (time and human) and external financing, identified based on the interviews, can be seen as related to the lack of resources described in the literature. As pointed out in Chapter 2.3.2, developing sustainable services and goods may include extra effort that often translates into indirect cost due to increased need for human and time resources (Rizos et al., 2016). Lack of time and human resources were also identified as an impediment based on the interviews and, therefore, as possibly hampering factors to the implementation of the CE projects. This is most likely related to small organization size, the number of available human resources, and prioritization of time in MSMEs. However, it may also be related to the expectation that CE projects should not compromise the other day-to-day operations, resulting in the companies allocating their time to different projects or activities instead of advancing the CE projects.

Moreover, many interviewees pointed out that engaging in CE projects often required direct investments from them, and getting the financial resources for such investments was seen as challenging and laborious. The results indicated that all of the participating companies required at least partial external financing for their projects. One interviewee pointing out that external financing is mandatory for a company of its size. Thus, indicating that they had insufficient financial resources of their own to pursue the CE projects. Which, according to Rizos et al. (2016), may hinder the micro-level implementation of CE. Furthermore, as Lahti et al. (2018) pointed out, shifting towards a CE business model may require high advance investments and a long time horizon for revenue generation, which may not suit shareholders with a short-term vision. This could be one reason behind the challenges related to finding private investors for the companies' CE projects. Besides, uncertainty and resources, COVID-19 pandemic was described as an impediment by two interviewees due to restrictions negative impact on the ability to have face-to-face negotiations. Also, it was seen to negatively impact the Finnish government's ability to focus on other initiatives than resolving the pandemic. This was an impediment that was not directly related to priorly presented literature, however, it was a current issue, which tested the companies' ability to cope with the changes in the external business environment.

Secondly, the research findings suggest that there were two opportunities to project-level implementation of CE. These opportunities serve to answer research question number three. The opportunities were, namely, perception of CE and commitment and available information and training. Similar to the identified impediments, the identified project-level opportunities were also relatively well aligned with the micro-level opportunities described in the literature. On one hand, in the case of perception of CE and commitment, the clear consensus among the interviewees suggested that CE was widely seen as a contemporary topic and as the future direction of the business in general. Therefore, CE-related projects were also viewed as very potential and sensible projects to pursue. Also, the research findings suggested that a strong managerial commitment to pursue the CE projects existed among the companies. This is undoubtedly a supportive factor for the implementation processes. Since, according to Lahti et al. (2018) and

Govindan & Hasanagic (2018), managerial commitment is imperative for enhancing CE implementation practices within organizations. The positive perception and commitment towards CE is also likely the reason why the companies did not experience short-term vision, described in Chapter 2.3.2, as an impediment for implementing CE projects.

On the other hand, available information and training were also seen to support the implementation of CE projects. Most interviewees felt that there is CE-related knowledge available if one knows where to look for it. Similarly, there are training's available, which can increase the CE-related knowledge of a company and enhance the capability to implement CE projects. This can be seen as supportive to the implementation of CE projects, as according to Sarja et al. (2021), gaining CE-specific knowledge likely favors effective CE implementation. However, while it may have an undisputed supportive influence, it is not necessary for the implementation of CE. For example, one interviewee stated that when they first started 50 years ago. They did not know that they were a CE company, although they were operating around the very fundamentals of CE. This is not exactly uncommon as, according to Rizos et al. (2016) and Prieto-Sandoval et al. (2018), many organization undertake processes that favour the implementation of CE, although they may not necessarily link them to the concept of CE. Nevertheless, having access to CE-specific information and training was widely seen as supporting the companies' ability to implement CE projects.

Finally, as a summary, Figure 5 illustrates the most conspicuous relationships between the themes identified based on the interviews (related to project-level implementation) and the themes identified based on the literature (related to micro-level implementation), as well as their relation to the research questions of this thesis.

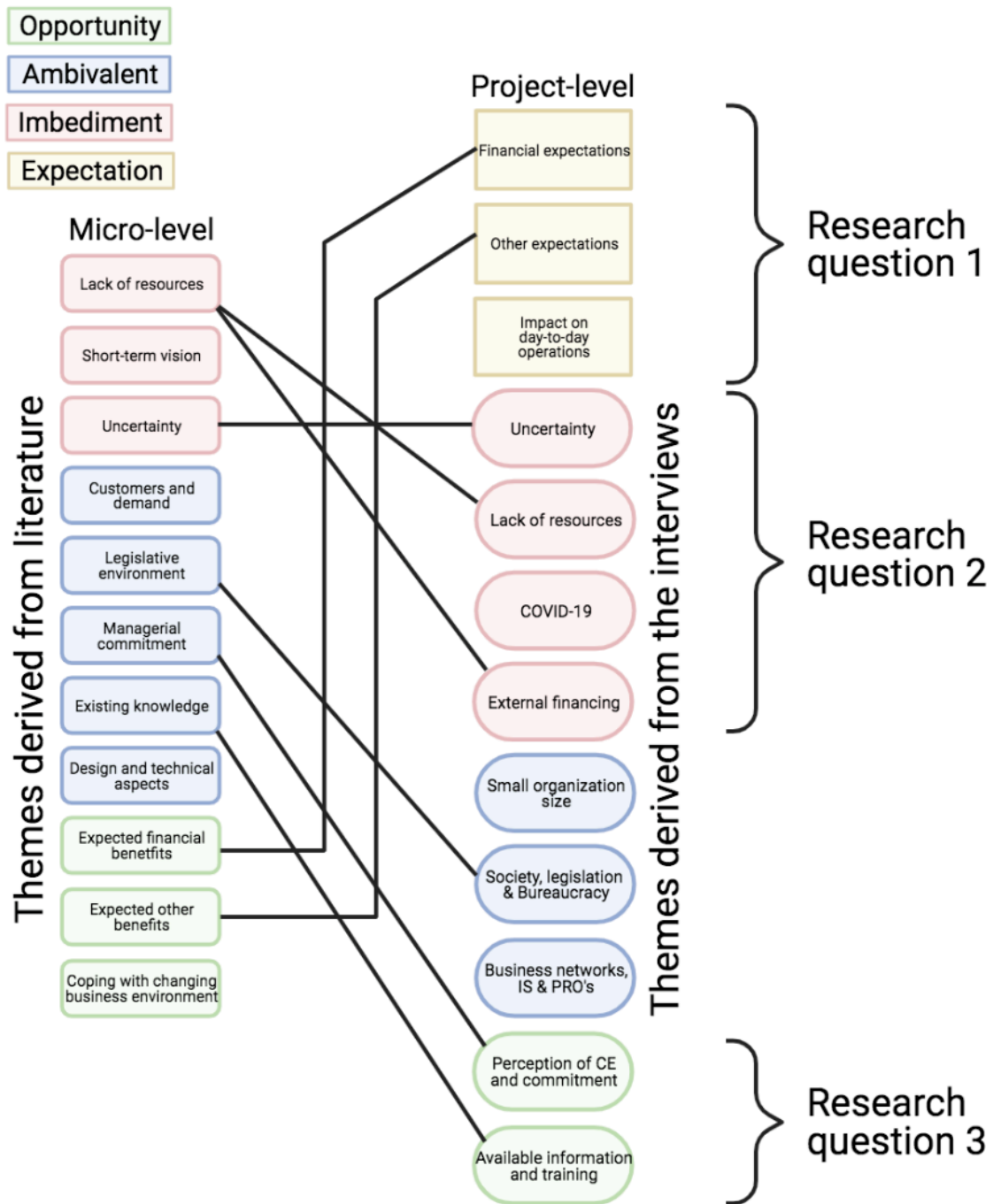


Figure 5. Relationship between theoretical framework, research findings, and research questions

5.3 Importance of networks

The research findings of the thesis indicate that having good business and personal networks may have a significant impact on the ease of project-level CE implementation. This deduction is related to themes within the ambivalent category since networks, or lack of them was described to have varying effects. On the one hand, having business partners that proactively engage in sustainable business practices was seen to support the implementation of CE projects within the companies by reducing the need to provide guidance. Similarly, forming IS in the business region was seen to withhold significant business potential and increase the collaboration and self-esteem of the companies working in the same industry. According to Prieto-Sandoval et al. (2018), having such industrial metabolism is essential for successful CE transition, particularly for SMEs', where the collaborative atmosphere helps to build competitive advantage and environmental innovation.

On the other hand, having a good relationship with PRO's and other potential suppliers were seen to help or hinder the implementation of CE projects, depending on the context, particularly those projects that turn into processes that are dependent on the continuous supply of raw materials. Since good networks may help companies to secure access to suppliers and the raw materials they require. Consequently, few interviewees described the lack of such networks and relationship to the PRO's as a significant hindrance and a bottleneck to their project. Similarly, throughout the interviews, it was implied that having a good relationship with the public servants may also help the implementation of CE projects. Since having good networks may help the negotiation process of different permits. Additionally, it may also increase the ability to lobby legislations' that can increase the prerequisites of their business and projects. Therefore, it could be suggested that having good networks may significantly influence one's ease of implementing CE projects.

5.4 Project nature impacting implementation

The sample of this research was very heterogeneous in the sense that most of the participating companies were of different maturity, scale, and industry. Therefore, the companies also had varying approaches and aspirations related to CE implementation. Consequently, the discussed CE projects within this thesis were all different from one another. For example, with one company, the projects considered primarily SDS in the making stage of the value chain, whereas with another company, the project considered downcycling and establishing a take-back system in the recovery stage of the value chain. Similarly, the scale of required investment for the project varied. For example, with one company, the investments were primarily related to the project's piloting and logistics. In contrast, with another company, the projects involved building a new manufacturing and

recycling plant. Needless to say, that this type of variations in the scale and nature of the projects may impact the implementation in one way or another. Also, the value chain stage to which the project is related may likely impact the ease of implementation. Interestingly, as described in Section 4 of this thesis, there were still many themes that were quite convergingly perceived to have a hindering or supporting impact regardless of the project's nature and requirements. Similarly, the expectations were all somewhat similar, although the nature of the projects varied. Nonetheless, no generalization should be made of these due to the very heterogeneous nature of the companies' aspirations, approaches, and the nature of the CE projects.

Lastly, it should be noted that, during the interviews, it became evident that the majority of the interviewees perceived implementing CE projects as no different from implementing regular projects within the organization. For example, one interviewee viewed that developing CE projects is merely a form of process development, just like any other project. This is somewhat surprising, since many interviewees still described that CE projects might have different expectations than regular projects, as previously described in Chapter 4.1.2. Therefore, one could argue that the project's nature may have a significant influence on the implementation of the project and the expectations for the project.

5.5 Setting goals and measuring success

Finally, as a secondary objective, the researcher was curious to briefly examine the goal setting and measuring of the CE efforts in the company and the project-level within the companies. Interestingly, most of the companies did not have any written goals for either company or project-level implementation of CE. This is rather surprising as all of the interviewees expressed that CE and sustainability are within the core values of their organization.

There were primarily three reasons, according to different interviewees, why there were no written company or project-level goals set for CE and sustainability. First, the management of the company had a clear and unified vision of how to approach CE and sustainability. Therefore, it was felt that there was no need for written goals. Second, small organization size was seen as a reason for having no need for written goals. Third, it was viewed that the legislative environment within the EU is so strict that the CE and sustainability-related goals come from the external legislation. Hence, there is no need to set own company or project-level goals for CE and sustainability. This somewhat supports the study of Ormazabal et al. (2018), which suggest that SMEs are still mainly focused on only necessary legal requirements, cost savings, and systemization. Nonetheless, these make for interesting and somewhat surprising statements, where one could even argue the third rationale to be somewhat flawed. Particularly, if one hopes to strive towards a forerunner status in CE, striving to be a company identified as sustainable and circular should be about going beyond external legislation. It is, after all, mandatory to obey the legislations. Therefore, simply by

obeying and settling into the level of external legislation is to be company among others, rather than to be a forerunner in CE or sustainability. Nevertheless, many of the participating companies also described actions that indicate going beyond external legislation in their operations. For example, one interviewee standing behind the third statement also said that they have paid for external environmental consulting to set higher environmental restrictions to their facilities than is dictated by the external legislation. Therefore, a minor conflict between setting goals and taking actions can be seen to arise from some interview statements.

Furthermore, most interviewees expressed that they currently have no detailed way to measure the success rate of the projects or that they primarily measure it through financial indicators. However, many interviewees also stated that they are thinking of measuring the projects in a more detailed manner in the future, for example, by measuring the mass of each recycled material and the work efficiency of the employees. This could be seen as a positive change, since measuring the CE projects impact on the circularity of the company requires also indicators that measure other aspects besides financial performance. These project-level indicators should, of course, vary according to the nature of the projects and the aspirations of the company. As an indicator that works for one project may not suite another project of different nature. In the end, although most participants stated having no specific measurements for their CE projects, it was promising that at least some sort of measurement still existed, even if it primarily considered financial aspects and happened at the company-level.

6 CONCLUSIONS

The final part of the thesis consist of two chapters. The first chapter intends to summarize the main objectives of the thesis and the key findings of the research by considering the overall contributions of this thesis. The second, and last chapter of the thesis intends to provide suggestions for further research within this research area.

6.1 Key takeaways from the thesis

The primary objective of this thesis was to explore the expectations that Finnish MSMEs have for the implementation of CE projects. Also, the thesis aimed to examine the perceived impediments and opportunities of implementing CE projects within Finnish MSMEs. This researcher approached the objective by interviewing a sample of Finnish companies that pursued implementing CE through engaging in CE-related projects and by conducting a thematic analysis based on these interviews. Through the analysis, a set of themes were derived to answers the objectives of the thesis. These results contribute to achieving a better understanding of organizations' expectations for engaging in CE projects. Additionally, the results shed light on the impediments and opportunities that may occur during the implementation of CE projects. Thus, hopefully decreasing the possible uncertainty related to the implementation process of CE projects within MSMEs.

The findings of this thesis indicate that there are three primary expectations for implementing CE projects within Finnish MSMEs. First, implementing CE projects is expected to increase profitability in terms of gaining profit or cost savings from the project. Second, implementing CE projects is expected to result in non-tangible benefits, such as establishing better customer relationships, increasing customer satisfaction, or increasing the prestige of the company's brand image. Third, implementation of CE projects was expected not to compromise the other day-to-day operations of the companies by threatening to increase costs, decrease the quality of the product, or decrease customer satisfaction. Hence, the development of CE projects was expected to happen on the side of day-to-day business.

Moreover, the findings suggested that there are four perceived impediments to implementing CE projects. First, uncertainty seemed to prevail around many projects. This had a hampering influence on implementation through the extra work affiliated with decreasing uncertainty. Second, lack of resources (time and human) had a hindering effect on the implementation of CE projects. Mainly because the small organization size and prioritization of tasks limited time and human resources which could be allocated for implementing the projects. Third, COVID-19 was seen as a minor hindrance due to its negative impact on the ability to have face-to-face negotiations. It was also perceived to hinder the implementation of external legislation, which may provide better prerequisites of business

related to CE. Fourth, and perhaps the most significant impediment, was external financing. While acquiring public funding was described as an overall clumsy and time-consuming process, private funding was described as challenging to acquire. Additionally, private funding often included high margins or required physical collateral for the loan.

Besides impediments, the findings suggested that there are two opportunities to implementing CE projects. First, the perception of CE and commitment was seen as supporting or enhancing factors to the implementation of CE projects. As CE was commonly perceived as the future way of business and as a current topic, it was deemed sensible to pursue projects that enhance it within the organization. Therefore, the image of CE catalyzed the companies to pursue it. Additionally, when the management was committed to pursuing CE within the organizations, allocating time and resources to the projects was not identified as a problem. Second, the availability of CE-related information and training was seen to enhance the implementation of the CE projects. Availability of information was perceived to remove uncertainties around the implementation process, as companies could educate themselves about the implementation practices and business opportunities. Likewise, participating in CE-related training was seen to expand the CE-knowledge within the organizations and escort the advancement of CE projects.

Additionally, the research findings suggest that having good relationships and extensive networks may significantly impact the ease of the implementation process. For example, IS was seen to increase the prerequisites of business and increase the self-esteem of the companies operating around fundamental principles of CE. Similarly, the project's nature is likely to impact the ease of implementation. An argument could be made that the bigger and more complex the project is, the harder it is to implement it. A bigger and more complex project often requires more resources, effort, and investments for the implementation process. Nevertheless, regardless of the size or challenges of implementation, it was promising to see that CE and CE projects were widely perceived as something that "simply makes sense". The projects were seen to withhold a great business potential, whether it was tangible or non-tangible benefits, they were seen as worthy projects to pursue. This is a promising direction for the global CE transition, in which MSMEs play an essential role.

6.2 Future research

There are plenty of directions to pursue within research related to the project-level implementation of CE. However, one prominent direction could be to dig further into the influence of the project's nature and how it impacts the implementation process. By expanding the considerations to the nature of the project, one might assess the value chain stage in which the projects are likely to be the easiest to implement. This could be fruitful for many companies, especially for

the companies that are willing to enhance CE within their operations, but lack the technical know-how to implement the more complex projects.

Furthermore, since the scope of this thesis is limited to a relatively small sample of Finnish MSMEs, one would suggest getting a more extensive sample for a similar study. Preferably a sample that includes large-scale companies as well, since they may have very different expectations, impediments, and opportunities related to implementing their CE projects. A larger sample would also aid the validity of the results. Finally, it would be interesting to conduct similar research within other geographical locations to gain a comparison point and a broader insight into the possible external influences on the projects' implementation.

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APPENDIX 1 Interview frame

Interview questions (translated from Finnish)

BACKGROUND INFORMATION:

1. Background information

- a) Could you briefly introduce yourself, who are you and what do you do for work?
- Could you tell me about the company?
 - What are the most central parts of your business model?
 - What are the essential activities that constitute your business?
 - How long have you worked in the company?
- b) How do you and the company perceive and understand the following terms: 1. Circular economy, 2. Sustainability?
- In other words, what does circular economy (and sustainability) mean to you and for the company?
- c) How is sustainability and circular economy related to your own daily work?
- Could you give some examples?

SUSTAINABILITY AND CIRCULAR ECONOMY IN GENERAL:

2. Sustainability in the company

- a) How does the company take sustainability into consideration in its operations?
- Could you give some examples? For instance, do you have environmental management systems in use?
 - Is there an emphasis on some certain aspect (social, environmental, economic) of sustainability?
 - If yes, why?
- b) How central part is sustainability to the company's operations?
- c) Has the company set any general and written goals regarding enhancing sustainability within the company?
- If yes, what kind of goals?
 - If no, why not? Are there non-written goals?
 - Is there a plan to set out sustainability related goals in the future?

3. Circular economy in the company

- a) How does the company take circular economy into consideration in its operations?
- How do you take circular economy into account in the different stages of the value chain? Is there emphasis on some certain part?
 - Could you give some examples?
- b) How central part is circular economy to the company's operations?

- c) Has the company the set any general and written goals regarding enhancing circular economy within the company?
- If yes, what kind of goals?
 - If not, why not? Are there any non-written goals?
 - Is there a plan to set out circular economy related goals in the future?
- d) Could you tell me a bit about the circular economy projects which the company has either done previously or is currently participating in?
- What is the primary nature of these projects? E.g. Investment projects vs. R&D?

CIRCULAR ECONOMY AT PROJECT LEVEL

4. **Implementation of circular economy projects and execution in practice**
- a1) Has the company set any goals for the implementation of individual circular economy projects?
- If yes, what kind of goals?
 - If not, why? Is there a plan to set out goals for individual projects in the future?
- a2) What kind of expectations the company has for circular economy projects, when considered from the company's point of view?
- What are the primary expectations regarding circular economy project implementation?
 - Does the company have other expectations regarding circular economy projects?
 - Why do you perceive these expectations as primary/most important?
 - Do the expectations differ regarding the nature of the project?
- b) What factors are experienced as challenging factors regarding implementation of circular economy projects? (In other words, from your point of view, is there any factors that could challenge or hinder the successful implementation of circular economy projects, or some factors that make it otherwise harder to implement?)
- Examples?
 - Why specifically these factors are considered as a challenging factors?
- c) What factors are experienced as helping factors regarding implementation of circular economy projects? (In other words, From your point of view, is there any factors that could make the successful implementation of circular economy projects faster, or otherwise make is easier to implement?)
- Examples?
 - Why specifically these factors are considered as easing factors?
- d) Does implementation process of circular economy projects differ from the company's general way to implement projects?
- If yes, why?

5. Measuring & Indicators

a) Do you somehow measure the extent to which your expectations have been fulfilled regarding individual circular economy projects?

- How do you do to the measuring?
- What indicators are being used?
- Why don't you measure this?

b) Are there any other means of how you monitor the success rate of the circular economy projects?

c) What happens to the monitoring of the projects when the projects are finished?

6. Ending & Thank you

Thank you very much for your time and for the participation.

a) Do you have anything else to add?

b) Is there something else that we should discuss about?