



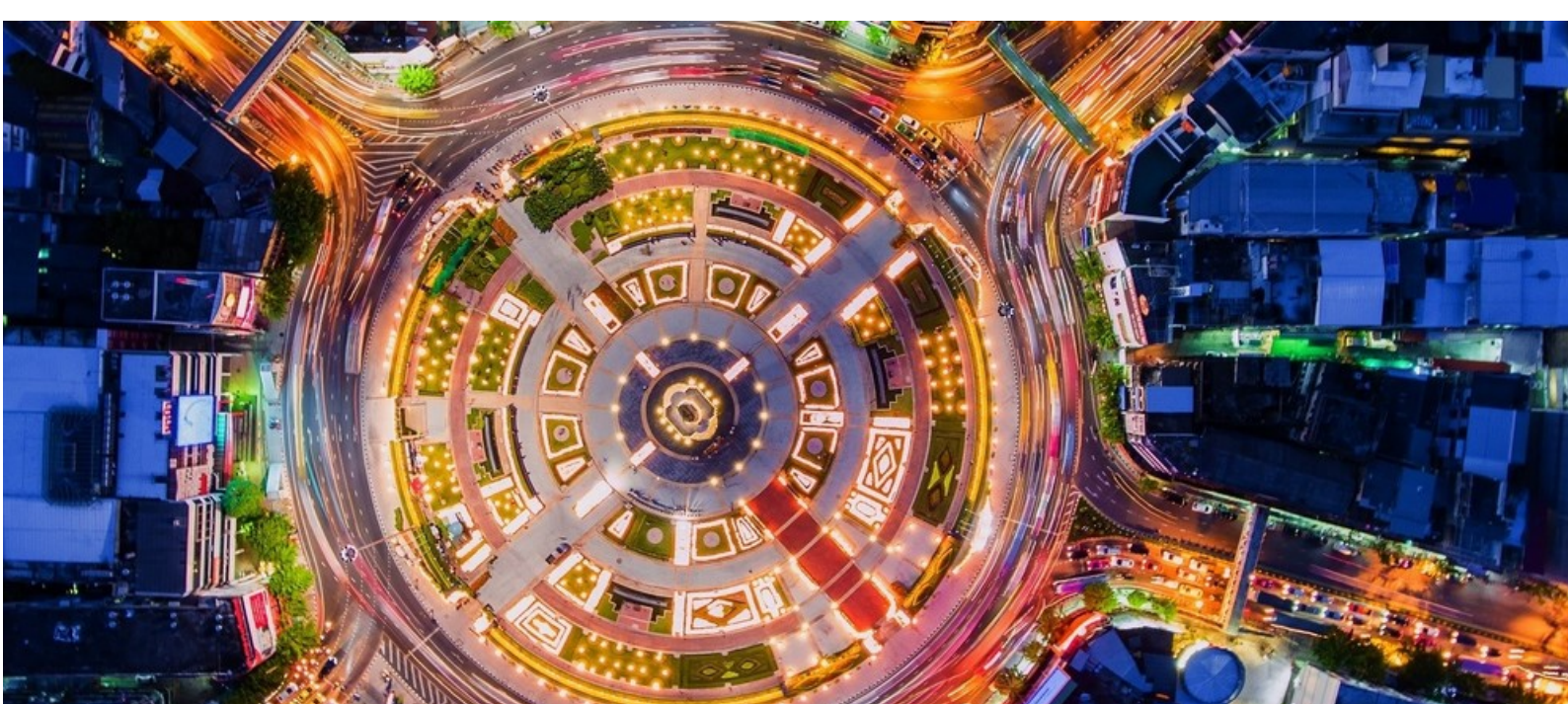
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# Working towards the Circular Economy

An analysis of the drivers, barriers and challenges experienced by circular entrepreneurs located in the Northern Netherlands

E.Z. van der Meer  
December 2018





# Working towards the circular economy:

## An analysis of the drivers, barriers and challenges experienced by circular entrepreneurs

Picture on front page: World Economic Forum (2018)

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# Abstract

The concept of the circular economy (CE) offers an alternative economic model that dissociates economic prosperity from ever-increasing resource consumption while at the same time altering the negative environmental and social effects that exist because of the current linear economic system. In the CE, the economy is seen as embedded, and thus confined, to the environment in which it is located. The concept of the CE is based on five core principles, namely: design for reuse, build resilience through diversity, rely on renewable energy, think in systems, and symbiosis (waste is food).

The transition from a linear economy to a circular economy is mainly characterised by two components. On the one hand, laws and regulations initiated by governmental institutions can accelerate or delay the transition to a CE. On the other hand, the transition is directly related to businesses that introduce new innovative business models that put the circular principles at the core of the business strategy. The Netherlands has developed the ambitious plan to have a CE in 2050 and have developed a national policy to foster the transition to a CE. However, the actual contribution of the entrepreneur in the transition to a CE remains blurred, both in academia and the national policies on the CE. Since small- and medium enterprises account for 99% of the Dutch economy, they are at the core of this research. The goal of this thesis is to clarify the motivations of entrepreneurs that include CE principles in their business model as well as to identify which challenges and barriers they experience while doing so, and whether geography plays a role in any of these aspects.

Through a qualitative case study design, entrepreneurs who include one or multiple CE principles in their business model were interviewed to find answers to these questions. By means of 17 semi-structured interviews, it was found that the main motivations that drive entrepreneurs to include CE principles are economic opportunities, government restrictions, intrinsic motivation, financially interesting, and fun to find new alternatives. The main barriers and challenges that have proven to influence the (further) implementation of CE principles are the lack of access to financial funds, the institutional context, a lack of market demand (both from a societal and business context) and finding suitable partners. In contrast to earlier research, it was found that the technological barrier was not indicated as the most prominent barrier impeding the transition to a CE. As a matter of fact, the technological aspect was mentioned as an enabling factor that could accelerate the transition to a CE. In general, the entrepreneur was indicated as a vital component in the transition to the CE since they were considered responsible for the development of new, innovative techniques that are required to meet the objectives of the CE. While no ground is found for stating that the motivations to include CE principles are directly influenced by the geographical context in which the entrepreneur operates, it seems that the geographical effect is more prominent in relation to the barriers and challenges experienced by the entrepreneurs. Hence, the removal of these barriers influenced by geographical context seems to offer room for the acceleration of the transition to a CE. When these considerations are brought to the forefront of the policy debate, it could be that entrepreneurs will be better facilitated to include CE principles in their business model, and thus contribute to the national objective of having a CE in 2050.

*Key words: Circular Economy, CE principles, entrepreneurship, sustainability, motivations, barriers and challenges, Economic Geography*



# Acknowledgements

Before you lies the dissertation *“Working towards the circular economy: An analysis of the drivers, barriers, and challenges experienced by circular entrepreneurs”*, which has been written to fulfil the graduation requirements for the Master’s degree programme of Economic Geography at the Faculty of Spatial Sciences at the University of Groningen.

During my entire university education, I have developed an interest in issues related to climate change, renewable energy, environmental issues and in more general the topic of sustainability as well as how geography plays a role in any of these aspects. When starting with the process of writing my master thesis, I was highly motivated to choose a topic in line with these interests. Based on the thesis that lies in front of you, I think this ambition has become reality. After reading the book ‘Doughnut Economics: Seven ways to think like a 21<sup>st</sup>-century economist’ by Kate Raworth, I was left with the practical question *“how?”*. Her book describes the need for the transition to a Circular Economy (CE) but does not offer practical information on how this transition should be initiated. After reading, I started thinking about who the actors are that operate in the current economic system and, based on this, decided to further explore the role of the entrepreneur in the transition to a CE. With this thesis, I hope to contribute to both the academic literature on circular entrepreneurship as well as offer insights for policy-making that could facilitate the transition to a CE.

This thesis would not have been possible without help and collaboration of many individuals. First and foremost, I would like to thank my supervisor, Dr. Aleid Brouwer, for providing constructive and motivating feedback on my draft versions and encouraging me to constantly improve my thesis to higher standards. Her help has led to a research process that has been joyful and educative.

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I hope you enjoy your reading.

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## List of abbreviations

CBMs	circular business models
CBS	Centraal Bureau voor de Statistiek (Statistics Netherlands)
CE	circular economy
LE	linear economy
LBM	linear business models
MNCs	multinational companies
SBI	standard industrial classification
SMEs	small and medium size enterprises





# Chapter 1: Introduction

To achieve long-term sustainability, there is a need for a fundamental new model of societal organization that differs from the idea that rising prosperity is inherently linked to ever increasing resource consumption (Sauvé et al., 2017; Hobson, 2016). A model that aims to go beyond incremental efficiency gains to bring this societal change is proposed by the concept of the circular economy (CE) (Preston, 2012, p.1). The CE is seen as a way to conceptualize the integration of long-term sustainability and economic activity in a way that allows for sustainable development of the economy within the boundaries of the global environment (Murray et al., 2017). At the core of CE thinking lies the recognition of the planet as a per definition circular system that has boundaries and restrictions in terms of resource use and pollution, rather than a system that can facilitate everlasting growth (Bocken et al., 2016). A comprehensive definition of the CE and what it entails is given by the Ellen MacArthur Foundation (2013, p.8):

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

This definition highlights the restorative and regenerative design of products in the CE as well as puts emphasis on the means of production in a more sustainable way by, for example, using renewable energy and eliminating the use of toxic chemicals that could harm humans or the environment (Hobson, 2016). However, the definition of the Ellen MacArthur foundation also draws attention towards the need for businesses that have these fundamentals at the core of their business models to achieve an industrial system that has a restorative and regenerative nature. According to Lewandowski (2016), the transition from a linear economy (LE) to a CE mainly depends on two components. On the one hand, the transition to a (more) CE can be accelerated or delayed which is dependent on the type of legislation and policy-making of governmental institutions. On the other hand, the transition is inherently linked to businesses that include circularity into their business models to have a thriving economy that meets demand within the limits of the environment (Lewandowski, 2016). Circular business models (CBMs) offer environmental benefits (e.g. zero waste production) as well as economic benefits. Entrepreneurs can gain a ‘circular advantage’ by developing new products, innovative technologies and/or prosperous business models, and thus gain economic benefits of using a CBM (Lacy & Rutqvist, 2015). Lewandowski (2016) highlights the importance of recognizing the need for both fundamental components; governmental and entrepreneurial, and their interconnectedness and interdependence to transition to a CE. A transition to a CE requires the integration of both bottom-up (firm level) and top-down (governmental) initiatives (Winans et al., 2017).

The Netherlands has the ambitious plan to develop a full CE by 2050. The widespread anxiety that business fail to address current sustainability issues (e.g. resource depletion, industrial pollution, and rising CO<sub>2</sub> emissions) must be countered by an approach in which businesses are the drivers of change towards an economy based on re-use, recycling and alternative business models (Murray et al., 2017). Therefore, the Netherlands has launched the Government-wide programme for a Circular Economy (in

Dutch: Rijksbreed Programma Circulaire Economie) to contribute to an environment in which businesses and governments work on integrating the objectives of a CE in all facets of society (Rijksoverheid, 2016). Murray et al. (2017) have found evidence that large corporations have steadily increased their attention for sustainability and corporate sustainability since 2000. Even though SMEs account for 99% of the Dutch companies, their contribution to a CE and a sustainable future is less well studied. Therefore, this research aims to contribute to this knowledge gap and focuses on the actions undertaken by SMEs in relation to the CE. SMEs can use the CE as a strategic business opportunity to differentiate themselves from competitors. Furthermore, Morsing & Perrini (2009) argue that SMEs can be seen as growth labs for innovation and product development which are of vital importance for the transition to a CE. In addition to this, SMEs are considered more likely to adapt to a circular business model (CBM) since they often have less rigid business structures, procedures, and regulations that delay the process of adapting to a CBM (Weltzien Høivik & Shankar, 2010). The contribution of SMEs to the CE is considered to go beyond the national economy since they take advantage of market liberalization, depend on worldwide suppliers, benefit from trade integration, and can operate at the European or global market (Weltzien Høivik & Shankar, 2010).

Relatively little scientific information exists on the implementation of CBMs by entrepreneurs at the SME level. Bechtel et al. (2013) studied the barriers and enablers of transforming to CBMs for multinational companies (MNC) in Sweden. The authors chose for MNCs due to their size and their assumed dominant influence on accelerating the transition to a CE. They found that barriers were mainly centred around financial, legal, and technological issues while enablers were more directed towards collaboration opportunities, motivations for both economic, social and environmental reasons, and a clear vision. They conclude that the barriers are mainly a result from external factors (the environment in which the firm is located) while the most important enabling factors have a more internal character (within the firm or the entrepreneur itself).

A study conducted by Kirchherr et al. (2017) focuses on barriers that hinder the implementation of CBMs in the European Union. The authors found four types of barriers: regulatory, market, cultural, and technological that can impede the implementation of CBMs. The authors emphasize the importance of 'first mover firms' as the potential driver for the CE transition. Circular start-ups have the benefit of starting with a CBM straight away, rather than adapting their traditional business model to CE standards. Finally, the authors draw attention to the government as a key stakeholder in the CE transition since they can abate some barriers experienced by firms by, for example, providing subsidies or impose strict regulations that force other firms to include circular thinking in their business models.

Rizos et al. (2016) have also conducted research on the barriers and enablers experienced by firms willing to implement CBMs at the European level. For their research, they particularly focus on SMEs within the European context. They found that the barriers experienced by SMEs are rather similar than those experienced by larger firms, such as technological, financial and market obstacles. They argue that SMEs are more likely to adapt to a CBM due to their size that makes it easier to change existing practices to CE standards. They mention the European Union as an institution that can impose legislation to take (some) barriers away. However, the results indicate that it might be difficult to have effective EU legislation targeting all barriers since certain issues may not be organized at the European level, and thus national or even regional legislation becomes important.

Finally, Jesus & Mendonça (2018) pay attention to the drivers and barriers experienced by entrepreneurs while implementing CBMs and make a distinction between two types of drivers and barriers: soft and hard. Technological and economic factors are considered *hard drivers & barriers* since it will become difficult to include circular principles within business models without those factors being in favourable conditions. If it is not possible for a firm to produce in a circular way, or when the products will not be sold in the market, it will be economically infeasible for a firm to transition to a CBM. *Soft drivers & barriers* relate to the institutional and cultural context that drives or hinders the entrepreneur to have a CBM. They emphasize the importance of the interconnectedness of the hard and soft drivers/barriers and that institutional and cultural context can play an important role in determining whether a firm will/can adapt circular principles in its business model.

## 1.1. Research objectives

### 1.1.1. Research problem

The researches discussed above predominantly focus on the barriers experienced by entrepreneurs and thus puts emphasis on the difficulty of implementing CBMs. However, there remains enthusiasm within both businesses and governments to work on the concept of a CE and thus there must be factors that drive entrepreneurs to transition to CBMs (Hobson, 2016). These motivations are not well defined and examined in the literature but are often influenced by contextual factors such as economic, social, technological, infrastructural and cultural factors. This study hence studies the factors that drive entrepreneurs at the SMEs level to implement CBMs as well as the obstacles they face while doing so, all within a certain geographical area to see whether or not the environment in which the entrepreneur operates has any effect on the transition to a CBM. The identification of the motivations, challenges, and barriers faced by entrepreneurs are of importance for policy-making and governmental organizations that could affect the pace of the transition to a CE, and thus be valuable to meet the set criteria for 2050.

### 1.1.2. Research goal

The goal of this thesis is to identify the motivations, challenges, and barriers experienced by entrepreneurs that operate at the SME level in the North of the Netherlands and who adopt (some) CE principles in their business model. Additionally, this research aims to study whether geography influences any of these aspects in order to improve the understanding of the contribution of entrepreneurs towards the Dutch governmental objective of developing a CE by 2050.

### 1.1.3. Research questions

To evaluate the motivations, challenges, and barriers experienced by entrepreneurs that adopt (some of) the principles of a CE in their business model and understand the role of geography in any of these aspects, the following research questions are defined:

Main research question:

*“What are the motivations of entrepreneurs for implementing CE principles in their business models, what are the challenges and barriers they experience during this process and how does geography play a role in any of these aspects?”*

The following sub-questions provide guidance and structure in order to answer the main research question:

1. What is the role of the entrepreneur in the transition to a CE?
2. What types of circular business models are used by circular entrepreneurs?
3. What are the most important motivations for circular entrepreneurs to include one or multiple CE principles in their business models?
4. To what extent do barriers and/or enablers have an effect on the transition process to a CBM?
5. To what extent does geography affect the ability of entrepreneurs to include CE principles in (certain aspects of) their business models, and how does geographical nearness of partners play a role in the transition to a CE?

The research questions are answered by analysing the data from an explorative case study of the Northern Netherlands. The Northern Netherlands has expressed the ambition to become the 'greenest region' of the Netherlands and acts as the frontrunner in the national transition to a CE. They focus on ensuring that the CE is a structural component of national and European governmental policies, ultimately resulting in (financial) support to stimulate regional economic activity in the direction of the CE (Bouwmeister, 2018). Furthermore, the three provinces aim to increase incentives for circular entrepreneurship by creating a demand for such products through their own actions. By focusing on cross-sectoral and cross-regional collaboration, the three northern provinces are oriented towards developing a common strategy to accelerate the transition to a CE. Major economic sectors that can contribute to the CE in the Northern Netherlands are agriculture, construction, waste management, and the chemical industry. However, the movement of circular entrepreneurship is growing in this region and more initiatives arise in other sectors as well. Due to the increased level of CE initiatives in the region, the proposed collaboration and willingness on working towards developing a CE, and the relative similar regional characteristics, the three northern provinces function as the unit of analysis for this thesis (Roemers et al., 2018; SNN, 2018).

## 1.2. Societal relevance

One of the major challenges of today is to integrate sustainability goals within an economic model that delivers environmental, social and economic benefits (Lozano & Witjes, 2016). The concept of the CE aims to deliver such a model that ultimately leads to a situation where production is environmental, economically and socially sustainable. This research aims to identify motivations, challenges, and barriers experienced by entrepreneurs who (partly) integrate circular thinking into their business model. The outcomes of this thesis can be used by entrepreneurs (both currently integrating circularity into their business models and the ones interested) as well as governmental institutions to gain a better understanding of the barriers and enablers experienced by circular entrepreneurs, and the effect of policies on the transition to a CE. All of this is important to contribute to an economic system that provides societal needs within the means of our planet and thus aims to prevent issues such as ocean acidification and climate change and their (often negative) respective consequences for society (Raworth, 2017). SMEs are at the focus of this research since they tend to experience more difficulties regarding developing new technologies and are often more dependent on overall trends in the market (Rizos et al., 2016). SMEs take up for more than 99% of the Dutch companies (CBS, 2017), highlighting the potential of the contributions of those companies to the transition to a CE in the Netherlands.

### 1.3. Scientific relevance

Even though the concept of the CE is being increasingly recognized and acted upon by actors such as governments, businesses and, civil society (Hobson, 2016), there is still little academic debate on the issue within the business and sustainability literature (Murray et al., 2017). However, academic research can take a *“broader and comprehensive look at the design of radically alternative solutions, over the entire life cycle of any process as well as the interaction between the process and the environment and the economy in which it is embedded”* (Geng et al., 2014, p. 12). The transition to a CE requires the presence of innovative concepts that meet these criteria as proposed by Geng et al. (2014). These innovations have to be initiated by the entrepreneurs using CBMs. However, there is no clear framework for understanding why and how entrepreneurs are adopting CBMs (Urbinati et al., 2017). Furthermore, Urbinati et al. (2017) describe the importance of understanding the complexity for firms to introducing circularity into existing business models due to (a lack of) technological expertise, customer demand conditions, capital restrictions etc. (Linder & Williander, 2015). Different sectors, firms, and entrepreneurs focus on different aspects that can contribute to a CE. Taking the firm as the unit of analysis to identify the motivations, challenges, and barriers experienced by those actors provides an interesting angle for empirical research (Urbinati et al., 2017; Linder & Williander, 2015; Vermeulen, 2015; Crainer, 2013). Such a synthesis of the literature on the drivers, intentions, barriers, and motivations of entrepreneurs to use CBMs holds several important contributions to the field of entrepreneurship. On the one hand, the thesis presents a coherent and extensive overview of theoretical concepts regarding the concept of the CE and links this to the existing literature on sustainable entrepreneurship. On the other hand, the thesis takes the entrepreneur as the unit of analysis which adds to the existing literature often focused on the top-down perspective regarding the transition to the CE.

### 1.4. Structure of the thesis

This thesis is organised as follows: Chapter 2 starts with a theoretical framework based on analysis of relevant theoretical concepts and academic literature regarding entrepreneurship, CE, CBMs and the effect of geography on any of these aspects. The conceptual framework is also presented in this chapter and the expectations of this research are stated. The methodology used in this research will be reflected upon in chapter 3. Here, an overview of the risks and limitations of this research and ethics will be discussed, as well as give reference to the chosen methods of data collection and how the data has been analysed. Chapter 4 presents the results of this study and chapter 5 discusses these findings in relation to the theoretical framework and the wider academic literature on this topic. Finally, the conclusion can be found in chapter 6. Here, the main research question is answered, the limitations of this research are discussed, and recommendations for further research are given.

## Chapter 2: Theoretical framework

This chapter provides a theoretical framework of the concept of the CE, its core principles and ideas, and the types of CBMs that can be distinguished, and ends in a conceptual model that integrates all the aforementioned aspects as well as described the expectations that are based on the theoretical framework. Paragraph 2.2 describes the role of the entrepreneur in the transition to a CE. An overview of the literature on different types (e.g. sustainable-, social-, circular-, ecological) of entrepreneurship is given in paragraph 2.3. Paragraph 2.4 provides an overview of the types of business models that can be used by circular entrepreneurs. However, this does not yet explain *why* an entrepreneur would use a CBM and possible answers to this question are given in paragraph 2.5. Furthermore, paragraph 2.6. elaborates on the barriers that entrepreneurs can experience while implementing CE principles. Paragraph 2.7 discusses the role of geography and how this determines the contextual factors that lead to an enabling or constraining environment in which the entrepreneur operates. The conceptual model and expectations based on the theoretical framework can be found in paragraph 2.8.

### 2.1. The Circular Economy

Since the 1980's the notion of sustainability has gained attention in both academia and government and has been at the core of the framework that aimed to integrate economic growth with social welfare and environmental protection (Asara et al., 2015). Despite sustainability being on the policy agenda for decades, increased demand for goods, services, and fossil fuels have led to environmental degradation and natural resource depletion around the world (and resultant effects such as ocean acidification and ozone depletion) (Steffen et al., 2015). In fact, Asara et al. (2015) argue that the sustainability framework has not led to the proposed harmonization of economic, social and environmental means. Economic growth has been, and still is, in many cases linked to resource- and energy use that sustains the issues of resource depletion and environmental pollution (Bergstrom & Randall, 2016). Murray et al. (2017) argue that this is a consequence of the lack of practical guidance offered by the sustainability framework to implement business strategies that contribute to a sustainable future. This has been acknowledged by governments, civil society, and academia, and has driven the demand for an approach that decouples economic growth from an everlasting increase in resource and energy demand (Schandl, et al., 2016). A relatively new attempt that integrates economic activity with environmental- and social sustainability is the concept of the CE (Murray et al., 2017).

The CE proposes a movement away from a linear relation between inputs and economic growth to a system that integrates economic activity within environmental boundaries while at the same time providing basic societal needs to all (Raworth, 2017). Rather than seeing the environment as the means that can be used to achieve economic development, the CE sees the economy as embedded (and thus restricted) within the environment and society in which it can be found (Heshmati, 2015). A perfect CE provides all individuals with access to life's essentials while ensuring that collectively the environmental boundaries of the earth are not overshoot (Raworth, 2017). She drafted an image of such an economy, which can be found in figure 1. The dimensions of the social foundation are derived from international agreements regarding minimal livings standards while the ecological ceiling is based on research by Rockström et al. (2009, in Raworth, 2018). The 'safe and just space for humanity' lies within the 'donut' (see figure 1), combining planetary boundaries and the issue of social justice in one image, thus including both environmental and social concerns (Raworth, 2018).

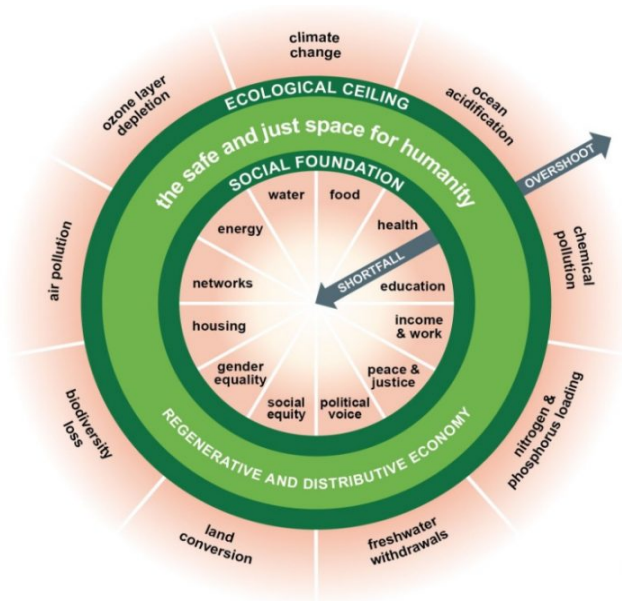


Figure 1: The doughnut economy - the outcome of a perfect CE economy (Raworth, 2018)

It yet remains unclear what a CE precisely entails, and various definitions exist in academic literature. This thesis uses the definition of the Ellen MacArthur Foundation as stated in the introduction. The CE is not a concept of novelty originating from recent developments but its underlying principles can be found in other schools of thought such as the blue economy (Lieder & Rashid, 2016), cradle to cradle (Geissdoerfer et al., 2017), natural capitalism, and industrial metabolism (see Lewandowski, 2016). Lewandowski (2016) argues that these approaches are complementary to each other and have similar basic principles as those of the CE, namely:

- Design for reuse
- Build resilience through diversity
- Rely on energy from renewable sources
- Think in systems
- Waste is food (symbiosis)

These five principles can be associated with the three main CE objectives that are often mentioned in the academic literature: reduce, reuse, and recycle (Ghisellini et al., 2016). Ideally, production in a CE optimizes the use of resources and simultaneously design products in such a way they can be reused as resources to produce other products. The opportunity to use the resources of one product as input for another product (at the end of a product lifecycle) minimizes the need to constantly consume more natural resources as inputs (Jawahir & Bradley, 2016). The three objectives are often associated with certain segments of the production process. The reduction principle mainly focuses on minimizing the inputs of raw materials, reducing the amount of energy used in the production process as well as lowering the total waste produced through improved efficiency (e.g. better packing technologies, using renewable energy, or more compact products that reduce transportation costs) (Feng & Yan, 2007; Su et al., 2013). The reuse principle mainly refers to the recycling of a product (such as second-hand clothing) or the reuse of components that serve as inputs for new products, and thus reduces the demand for raw materials to produce those products (Jawahir & Bradley, 2016). Gwehenberger et al. (2003) state that if recycling is completely efficient and no waste remains unused, there is no incentive to change segments of the production process (and thus there is no need for the reduce objective) but



it remains unclear if and when such a situation occurs. The recycle principle relates to the reprocessing of materials products similar to the original product or completely alternative products (Ghisellini et al., 2016). Especially the use of materials as resources for products that are different from the initial product highlights the importance of system thinking that is at the core of a CE (Jawahir & Bradley, 2016; van Renswoude et al., 2015). Without the ability to use materials of one product as resources for other products, there will be an economy that consists of thousands of individual systems that makes it complicated to establish a CE. There is a need to create an industrial network in which companies can use and reuse products and materials even though the initial use of the resource is different from the newly produced product (Raworth, 2017).

The basic assumptions and CE principles as discussed above are combined in figure 2. System thinking is at the core of this diagram which is divided in a technical- and biological system due to differences in types of materials and its consequences for recycling and reusing the resources. System thinking creates opportunities for entrepreneurs since they can benefit from developing technologies, products and/or services that facilitate reusing or redistributing (parts of) products and services.

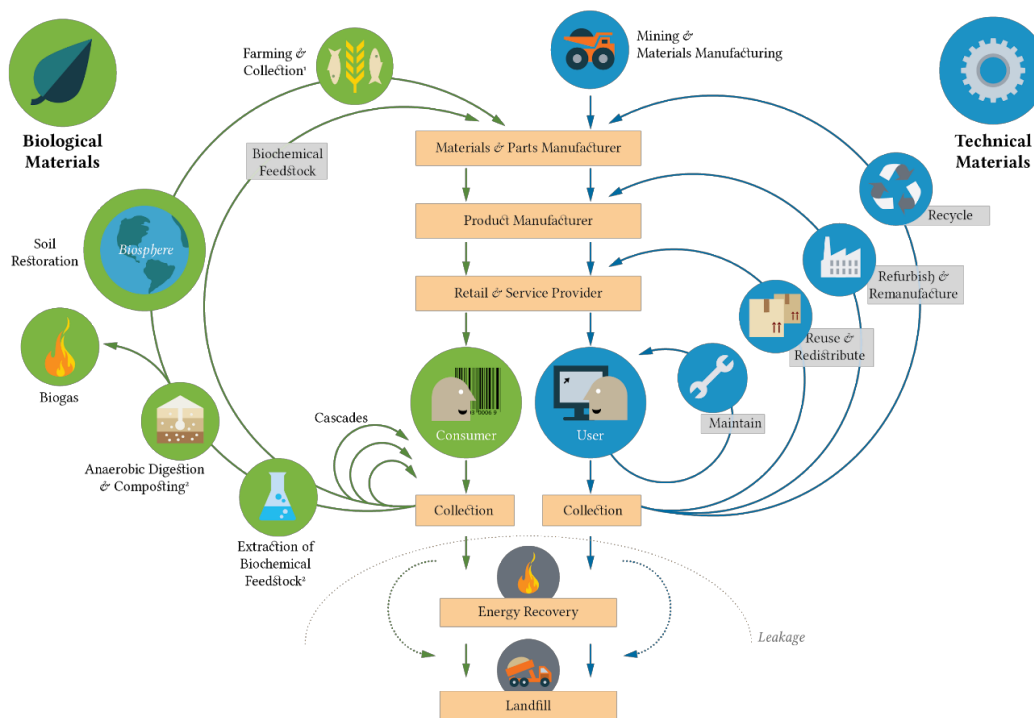


Figure 2: Conceptualization of a circular economy (Ellen MacArthur Foundation, 2018)

## 2.2. The entrepreneur as the driver of change and innovation

The transition from a 'take-make-dispose' economy to an economy that is regenerative and distributive by design is inherently linked to innovations that enable the development of new products and/or techniques that increase the ability to reuse, reproduce and recycle resources (Raworth, 2017; Jesus & Mendonça, 2018; Schot & Kanger, 2016). The relationship between entrepreneurship and innovation is often related to the work of Schumpeter who described the entrepreneur as the actor that introduces radical or incremental changes to (new) products, services or production processes to the market. This would drive a destruction process that causes structural economic changes (Galindo & Méndez-Picazo, 2013; Autio et al., 2014), ultimately contributing to increased employment levels



and economic growth and success (Williams & McGuire, 2010; Piperopoulos, 2012). A slightly different perspective on entrepreneurship, innovation and economic growth is given by Knight, who introduces the problem of selection regarding the success (or failure) of entrepreneurs. In contradiction to Schumpeter, Knight argues that not all ventures will become successful, some innovations initiated by entrepreneurs might fail and thus not contribute to economic growth (Brouwer, 2002). Therefore, Knight introduces the concepts of risk and uncertainty as key aspects that should be considered in studying entrepreneurial activity, innovation, and their effects on the economy (Galindo & Méndez-Picazo, 2013). It is difficult to predict whether an innovation will be successful, and the profits earned by entrepreneurs are the rewards for bearing this uncertainty. In this thesis, the Schumpeterian definition of an entrepreneur is used to define the group of interest, namely someone who “*exploits market opportunity through technical and/or organizational innovation*” (Eroğlu & Piçak, 2011, p.146). Such organizational and technological changes within firms are necessary for the transition to a CE that is inherently different from a LE. It remains important to remember that not all firms acting upon CE principles will automatically be successful or cause structural economic change (which reflects the contribution of Knight). Entrepreneurs acting upon CE principles are classified as innovative actors since they act upon market opportunities and conditions that require alternative products, services or processes and thus they do not differ from the Schumpeterian definition of an entrepreneur.

The above discussion on the relationship between entrepreneurship and innovation does not yet fully explain *why* entrepreneurial innovation takes place. Garud et al. (2014) make a distinction between an actor-centric perspective and a context-centric perspective in explaining entrepreneurial innovation. The actor-centric perspective draws attention to individual characteristics that serve as explanation why certain individuals are willing to take the risk associated with starting up a business. Personal traits such as the need for achievement, risk-taking behaviour, and self-efficacy are often mentioned as characteristics that make individuals more likely to pursue entrepreneurial activity (Zhao et al., 2005; Ferreira et al., 2017; Dew, 2009). Despite the large body of literature focusing on personal characteristics as dominant explanatory variables for entrepreneurial innovation, research by Hjorth et al. (2008) and Mitchell et al. (2002) (among others) have shown that there are factors beyond the personality of the entrepreneur that influence the occurrence of entrepreneurial innovation. The physical environment, geographical proximity to other firms, existence of knowledge structures, institutional context (from either a national, regional, or industrial perspective), and market conditions are just a few examples of contextual factors that leads to different initial conditions and possibilities for innovations to take place (Garud et al., 2014; Williams & McGuire, 2010; De Pablos et al., 2015). Considering these contextual factors, the importance of understanding policy action and its effect on entrepreneurial innovation becomes evident. Policy initiated by either national or regional governments attempts to influence entrepreneurial innovation by affecting (one or multiple of) the contextual factors in which the entrepreneur operates (Audretsch & Beckmann, 2007; Autio et al., 2014). The occurrence of innovations, whether they are incremental (minor adjustment to existing technology), architectural (use existing technology for new purpose) or discontinuous (introduction of totally new business/technology into the market), consists of a combination of actor-specific characteristics and contextual factors that influence entrepreneurial decisions (Williams & McGuire, 2010). Autio et al. (2014) have developed a framework that shows how entrepreneurial behaviour is influenced by contextual factors and personal characteristics (figure 3), highlighting that it might be too simplistic to talk about ‘the entrepreneur’ in general (Hessels et al., 2008).

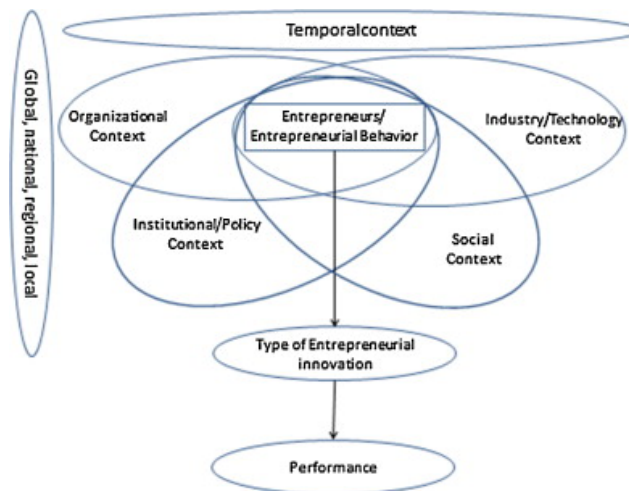


Figure 3: Framework presenting the relationship between personal characteristics and contextual factors influencing entrepreneurial behaviour and innovation (Autio et al., 2014, p.1098).

The temporal context varies for entrepreneurs but earlier research identifies certain factors that allow for more favourable conditions to act upon CE principles. Zamfir et al. (2017) argue that some economic sectors offer more favourable conditions for circular entrepreneurship than others since specific sectoral regulations can hinder the inclusion of CE principles in a business model (e.g. the hospitality industry in which strict hygiene regulations could prevent the exchange of resources between firms/economic sectors). Berent-Braun et al. (2010) state that firms operating in the ‘tangible products sector’ (manufacturing, agriculture, and construction), as well as family-owned SMEs, proved to be more likely to be circular entrepreneurs. Furthermore, the amount of financial support available for SMEs is an important driver for ‘circular’ innovation to develop new products or processes that are in line with CE principles. In addition to that, Zamfir et al. (2017) argue that the legal- and organizational context of a country/region contributes to the number of firms including CE principles in their business model. Based on this information, it could be stated that the Northern Netherlands has favourable conditions for circular entrepreneurship. Important economic sectors in the Northern Netherlands are ‘tangible products sectors’ (agriculture, construction, waste management and the chemical industry (Roemers et al., 2018)) and are thus more likely to include CE principles according to Berent-Braun et al. (2010). The commitment of the region to give (financial) support to firms acting upon the CE can be an important incentive for firms to develop new circular technologies and/or products.

### 2.3. What does an entrepreneur aspire?

After defining who is considered an entrepreneur and what innovation entails, it remains interesting to understand what entrepreneurs aim to pursue by their actions. Academics such as Schumpeter and Knight saw the entrepreneur as a utility maximizing individual (Douglas & Shepherd, 2000). However, empirical evidence shows that entrepreneurs are not solely driven by economic incentives but that the social, cultural and/or regulatory context can influence the economic decisions of the individual (Bruton et al., 2010). Entrepreneurs who are not entirely focused on profit maximization and consider other issues are described in the literature extensively under various terms; such as social-, sustainable-, and ecological entrepreneurship.

The concept of sustainable entrepreneurship is the most prevalent in the academic literature on sustainability and entrepreneurship and multiple definitions of this concept can be found. A

reoccurring common theme in these definitions is the process of exploiting economic opportunities that are a result of market failures which detract from sustainability by producing goods and services that have positive economic, social and environmental consequences (Hockerts & Wüstenhagen, 2010; Belz & Binder, 2015; Dean & McMullen, 2007). There are economists like Belz & Binder (2015) that argue it is hardly ever possible that environmental, social, and economic goals are mutually reinforcing. In other words, they seem to recognize two kinds of businesses: for-profits and non-profits and their respective rigid missions that do not allow for a hybrid organizational form that pursues a combination of environmental, social, and economic goals. However, entrepreneurial activity and academic research shows there are businesses that combine profit and purpose (Besley & Ghatak, 2017), and thus move away from the rigid division between for-profit and non-profit firms as mentioned by (e.g.) Belz & Binder (2015). An emerging and rapidly growing group of entrepreneurs strives to advance social and/or environmental change through innovative solutions (Kickul et al., 2018). These entrepreneurs are often driven by the intrinsic motivation to create a positive impact (social and/or environmental) that is ethically just (Christopoulos & Vogl, 2014). In other words, these entrepreneurs aim to 'do-no-harm' or better yet 'do-good' through their entrepreneurial activity in which profit-making is not the main objective of their business, but more seen as means to achieve other aspirations (Rahim & Mohtar, 2015; Markman et al., 2016).

The aspirations and motivations of an entrepreneur drive the trade-off between the goals and possible gains of their entrepreneurial activity. The literature states that sustainable entrepreneurs are driven by economic gains that can be exploited because of market failures that harm the environment (Belz & Binder, 2015; Schaper, 2016), and there are additional non-economic gains that can be achieved by producing in a sustainable way. The way in which entrepreneurs prioritize the economic and non-economic gains differs greatly between individuals (Shepherd & Patzelt, 2017), serving as an explanation for the various definitions that exist of sustainable entrepreneurship.

A large share of the academic literature on sustainable entrepreneurship makes a division between social and environmental (also referred to as ecological) entrepreneurs. Social entrepreneurship is often associated with mission-driven rather than profit-driven enterprises (Dean & McMullen, 2007; Belz & Binder, 2015) that aim at generating product or service innovations that have a social purpose (Hockerts & Wüstenhagen, 2010). In addition to this, Belz & Binder (2015) state that social entrepreneurship mainly focuses on intragenerational equity, and thus is more focused on present generations and the issues they face. This contrasts with environmental entrepreneurship which tends to focus on producing in an environmentally sustainable way (e.g. minimize pollution, use fewer chemicals) and thus addresses both intragenerational and intergenerational equity (considering the effects for both present and future generations) (Shepherd & Patzelt, 2017). Environmental entrepreneurs, or ecopreneurs, are not identical to sustainable entrepreneurs since they tend to focus on a double bottom line (economic and environmental) rather than a triple bottom line (economic, environmental and social), as is the characteristic of sustainable entrepreneurship (Hockerts & Wüstenhagen, 2010; Dixon & Clifford, 2007; Schaper, 2016). Hence, environmental- and social entrepreneurship can be seen as subdivisions of sustainable entrepreneurship. Such a classification helps to understand which firms are sustainable, and thus strive for the triple bottom line, and which firms classify under the two other concepts.

The literature does not (yet) offer a clear definition of what circular entrepreneurship is, and whether it is different from sustainable-, environmental-, or social entrepreneurship (Heshmati, 2015). Because these entrepreneurs produce additional value (societal and/or environmental) outside the economic domain, they cannot be defined as entirely efficiency-seeking individuals. An explanation for their behaviour (that is not solely focused on profit maximization) can be found in institutional theory (Roy, 1997). Institutional entrepreneurship refers to entrepreneurs who shape the institutional context by, for example, providing new products or services, lobbying for new government regulations, and introducing new types of business models (Bruton et al., 2010). Institutional entrepreneurs are interested in exploiting the opportunities that lie in creating new institutions or changing existing institutions in such a way to meet their objectives (such as the three objectives of CE or the triple bottom line of sustainable entrepreneurship), while at the same time being economically viable (Anderson & Hill, 2004; Fischer & Pascucci, 2017; Rao et al., 2000). In other words, an institutional entrepreneur is “...an actor that has an interest in developing new institutions or facilitating change in existing institutions (replacing the old with the new), and leverages resources to achieve this change” (Fligstein, 1997 in Shepherd & Patzelt, 2011, p.148). In this definition, the Schumpeterian perspective on entrepreneurship and innovation can be recognized since institutional entrepreneurs that include CE principles in their business model tend to change existing institutions by introducing new products, services or production techniques that differ from those present in the LE (Fischer & Pascucci, 2017). In absence of a formal definition, this thesis has developed its own definition of a circular entrepreneur as “an individual who exploits opportunities that exist as a result of market failures, while acting according to (one of) the principles of the CE” as given in paragraph 2.1.

#### 2.4. How does a circular business model look like?

Circular entrepreneurs have different aspirations than profit-maximizing entrepreneurs which require innovative business models. The definition of business model innovation draws on the definition of innovation as given by Schumpeter in which innovation is seen as; a) the introduction of new goods; b) new methods of production; c) opening of new markets; d) new product inputs; or e) new organizational models (Planing, 2015). All these types of innovations can be classified as CBM innovation as long as the proposed business models create or capture value because of including CE principles in their business models (Beulque & Aggeri, 2016).

To be able to distinguish between linear business model (LBMs) and CBMs, this research focuses on how resources are used within the business model and how the resources flow through the production system (Bocken et al., 2016). Firms who operate under a LBMs create or capture value based on a continuous flow where raw materials enter the system in which they are produced into goods, consumed, and finally discarded (Bocken et al., 2016; Linder & Williander, 2015). The resource flow pattern is a unidirectional pattern which requires constant input of new materials (Bocken et al., 2016), as can be seen in the schematic overview presented in figure 4.

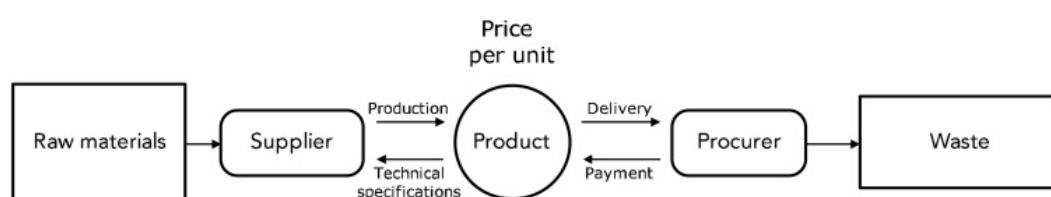


Figure 4: Schematic overview of the flow of resources in a linear business model (Witjes & Lozano, 2016)

A CBM is defined as a model through which a firm utilizes economic value of products that remains unused after the production of new goods and uses this for value creation to generate profits or create products in such a way that social and/or environmental value is generated in addition to economic value (Linder & Williander, 2015, Planing, 2015). The flow of resources in this kind of business model is inherently different from that in LBMs as can be seen in figure 5.

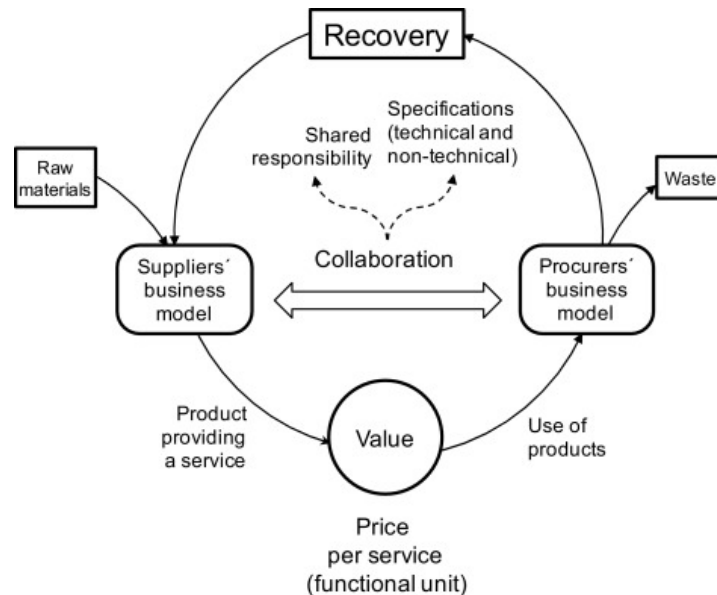


Figure 5: Schematic overview of the flow of resources in a circular business model (Witjes & Lozano, 2016)

In summary, the main difference between CBMs and LBMs lies in the way how resources flow through the system by means of creating and capturing value. Important is to notice that a single firm does not have to be entirely circular but can be part of a system of CBMs that together close a material loop, and thus act according to CE principles (Mentink, 2014; Planing, 2015; Antikainen & Valkokari, 2016). This kind of system thinking is at the core of the CE which can also be found in figure 2, which indicates multiple cycles within the CE system that leads to different possibilities for entrepreneurs to contribute to a CE (e.g. repair, decompose or recycle). Bocken et al. (2016) provide an overview of CBMs, which can be found in table 1.

Table 1: Types of business model innovations that include one or multiple CE principles (Bocken et al., 2016)

Business model strategies	Definition	Example of cases
1. Access and performance model	Providing the capability or services to satisfy user needs without needing to own physical products	- Carsharing - Tuxedo hire - Leasing jeans
2. Extending product value	Exploiting residual value of products or collection products between distinct business entities	- Clothing return initiatives - Remanufacturing of parts in the automotive industry
3. Classic long-life model	Business models focused on delivering long-product life, supported by design for durability and repair for instance	- Luxury products claim to last beyond a lifetime - White goods
4. Encourage sufficiency	Solutions that actively seek to reduce end-user consumption through principles such as durability, service and upgradability	- premium, high service, and quality brands - Energy service companies

5. Extending resource value	Exploiting the residual value of resources: collection and sourcing of otherwise wasted materials or resources to run into new forms of value	- Recycle bank - Interface (collecting fishing nets as a raw material for carpets)
6. Industrial symbiosis	A process-oriented solution concerned with using the residual output from one process as feedback for another process, which benefits from geographical proximity of businesses	- Eco industrial parks

Business model one to four in table 1 are examples of CBMs that contribute to the lifespan of products and thus slow down the linear flow of materials through the system. The CBMs mentioned under number five and six in table 1 attempt to close resource loops by establishing a circular flow of resources (Bocken et al., 2016; Mentink, 2014; Planing, 2015). Entrepreneurs that act according to one of these CBMs are classified as circular entrepreneurs within this research.

## 2.5. Reasons for including circular thinking in business models

The CE offers an alternative way to generate profit in comparison to the neoclassical economy in which firm productivity is the driver of a competitive and thriving economy. In the classical economic perspective, firm productivity relies on full (or at least to the highest degree of) employment which is difficult to maintain without increasing resource use in production. This means that productivity and economic progress are automatically linked to capital accumulation and increased resource use. The focus for circular entrepreneurs is inherently different since the aim of the business shifts away from generating profits by selling products to generating profits from the flow of materials and products over time (Bocken et al., 2016). In this sense, the concept of the CE differs from concepts such as sustainability since it puts emphasis on the economic actors as the main beneficiaries of implementing circular thinking in their business models, rather than society or the environment (Geissdoerfer et al., 2017). A CBM will initially have an economic advantage for the firm and additionally contribute to more environmental relevant issues such as environmental pollution and resource depletion (Heshmati, 2015). The following paragraphs will elaborate on the motivations of entrepreneurs to choose a CBM.

### 2.5.1. Economic benefits of circular thinking

If firms can gain a 'circular advantage' over other firms because of implementing a CBM, it can be seen as logical that firms have reasons for voluntarily working towards more circular business models that move away from the idea that firm productivity is inherently linked to increased resource consumption. Lenczuk (2017) proposes three types of motivations for entrepreneurs to include circular thinking into their business model (which are discussed separately in paragraph 2.5.1, 2.5.2, and 2.5.3). She argues that businesses try to capitalize on the increased attention for sustainability/circularity by society. The pressure and demand from society to (e.g.) produce in a more environmentally friendly way or with less waste generation, can be an important incentive for firms to transition to a greener approach in their business model. However, this could lead to a situation in which firms tend to operate under the principles of CBMs, but in essence is a facade of their real production process that does not meet the criteria as proposed by CE that are demanded by society (Stecker, 2016). This is also known as 'greenwashing' and can be defined as *"the selective disclosure of positive information without full disclosure of negative information so as to create an overly positive corporate image"* (Lyon & Maxwell, 2011, p.6). It can be difficult to determine which firms are actually implementing CE principles and

which might be considered as 'greenwashing firms'. Safeguards that could function as a tool to point this out can be found in; I) increased stakeholder alertness and new information technologies that serve as a way that improves the ability to closely watch over firm practices and allow to keep track of production processes and material flows (Bowen, 2014; Scott, 2015), and II) legislation that demands accountability and transparency in the whole production process of the firm (Stecker, 2016). It is expected that those two safeguards are also mentioned by circular entrepreneurs in the North of the Netherlands as a tool to differentiate circular firms from greenwashing firms.

### 2.5.2. Governmental restrictions as motivation for circularity

The aforementioned idea of governmental legislation that demands firm transparency regarding its production techniques relates to the second reason for including circular thinking into business models as proposed by Lenczuk (2017). She argues that stricter government regulations can impose incentives for firms to change their production process in line with CE principles. This is in line with Lewandowski (2016) who states there are two broad policy strategies that can be distinguished that accelerate the transition to a CE. On the one hand, governmental regulations can fix market failures that cause situations that are contradictory to the CE principles by imposing restrictions on, for example, certain types of production techniques or processes (Jackson, 2011; 2017). This type of government action is aimed at balancing individual (firm) decisions (which are often short-sighted) against their long-term effects on common goods (such as the environment or society). On the other hand, governments can facilitate market activity that acts in line with CE principles by, for example, providing financial or technical assistance that stimulates innovations (Lewandowski, 2016; Jackson, 2011). It can be concluded that the institutional setting in which the entrepreneur operates enables or constrains the opportunities for circular entrepreneurship (Baumol et al., 2009; Hwang & Powell, 2005).

Even if the government holds the ability to incorporate long-term circular thinking in their policies, Kitanov (2011) debates the ability of the government to impose strict regulations to stimulate the use of CBMs due to limited influences in market processes. Senker (2011) also questions the ability of governments to be the actor that drives entrepreneurs to change to CBMs since governments depend on firms to create employment in their respective administrative area (municipal, region, province etc.) and on taxation of products and firms to support government expenditures (not necessarily relevant at all administrative levels). Imposing these strict policies and regulations could lead to firms relocating to other areas where these strict regulations are not present, and thus decrease government revenues that come from taxations and economic activity within the region. Hence, Senker (2011) and Kitanov (2011) both question the ability of the government to impose strict regulations as a motive for entrepreneurs to act upon CE principles, which contrasts with Jackson (2011, 2017) and Lenczuk (2017). In fact, Jackson (2011, 2017) argues that government actions such as providing financial or technical assistance to entrepreneurs who are willing to adapt to a CBM can be an incentive for that person to locate in a specific location. In fact, governmental interference as proposed by Jackson (2011) and Lenczuk (2017) can positively influence the transition to a CE by creating favourable location conditions (also see §2.7.1). Based on previous research, it is expected that the participants of this research assign the government a double role. The government should facilitate circular entrepreneurs while at the same time restrict entrepreneurs who do not act in line with CE principles.

### 2.5.3. Intrinsic motivation 'to do good'

Bell & Stellingwerf (2012) argue that firms that simply comply to government regulations should not necessarily be seen as 'circular firms' due to the fact that these firms are not actively demonstrating the will to include circular economic thinking in their business models. They argue that this kind of passive adaptation can still be seen as a form of 'greenwashing' and that entrepreneurs should also be willing to actively enforce the change. This is similar to Lenczuk (2017) who argues that the intrinsic motivation to adapt to a CBM should be seen as a separate (and final) motivation for including CE principles in a business model. The individuals' attitude towards environmental and/or societal issues can play an important role in for including CE principles in a business model (Nhuyen & Boberg, 2010). In many cases, this intrinsic motivation of the entrepreneur influences the business model in such a way they cannot be considered as efficiency-seeking individuals that strive for profit maximization but as actors that strive to generate impact outside the economic domain (Roy, 1997). The expectation is that intrinsic motivation is a dominant motivation for all participants in this research to act upon CE principles. The idea of intrinsic motivation as an explanation for entrepreneurs who do not only act on economic reasons is further explored in the concept of the purpose economy.

#### 2.5.3.1. *The purpose economy*

Within the entrepreneurship literature, there are many examples of researches that have indicated that entrepreneurs might be driven by a purpose to make a societal or environmental impact, rather than solely striving for the highest profits (e.g. sustainable-, social-, and ecological entrepreneurship) (Cohen & Muñoz, 2015). Hurst (2016) argues that contextual factors such as technological progress, higher levels of education, culture, information technologies, and societal/personal values have contributed to this notion that entrepreneurs seek to generate value that goes beyond the personal level. Business models initiated by these entrepreneurs aim to combine pressing societal or environmental issues with economic success, and thus combine business and altruistic motives (Cohen & Winn, 2007; Parrish, 2010). In other words, the reason (or purpose) of the existence, meaning, and direction of businesses relates to the creation of economic value that simultaneously promotes social and/or environmental values, and thus affects society or the environment (Hollensbe et al., 2014). The purpose economy is often mentioned as the conceptualization of an economy that integrates economic activity with broader critical human needs such as belonging, personal development and drive to contribute to a community/society (Hurst, 2016). Hurst (2016) proposes three sources of purpose that are desired by entrepreneurs, or individuals in general: personal, social and societal. Personal purpose refers to the individual awareness on a certain issue that leads to entrepreneurial activity to contribute to this issue (e.g. production of fairphone as a reaction to conventional production/mining techniques that led to serious conflict in the Democratic Republic of Congo, see Akemu et al., 2016). Businesses whose primary purpose is to create social purpose tend to create social value that benefits other individuals as well as the entrepreneur itself (Mort et al., 2002; Hurst, 2016). Finally, societal purpose relates to entrepreneurial opportunities that might emerge because of shifts in public purpose that creates opportunities for entrepreneurs to pursue the individual motivations of the entrepreneur through their business venture (Hollensbe et al., 2014). These opportunities emerge because of changing purpose perspectives of the entrepreneur itself (intrinsic motivations) (Cohen & Muñoz, 2015), or because of changing societal demand (external effects) (Hurst, 2016). However, in both cases, purposeful entrepreneurs can be classified as circular entrepreneurs since they since they act upon market opportunities that have a positive societal - or environmental impact.



## 2.6. Barriers and challenges faced by entrepreneurs when implementing CBMs

The previous paragraph has provided explanations for why entrepreneurs would use CBMs but there are also several types of barriers that can hamper the implementation of a CBM. These barriers can broadly be subdivided into four categories: technology, financial, institutional context, and societal context (Fernández-Serrano & Romero, 2014; Jesus & Mendonça, 2018; Ritzén & Sandström, 2017) and will be elaborated on in the following sub-paragraphs.

### 2.6.1. Technological barrier

Technological barriers that impede the inclusion of CE principles in existing or emerging businesses predominantly relate to the (un)availability of technologies that facilitate continuous resource re-use or resource optimisation (Jesus & Mendonça, 2018). The lack of (access to) appropriate technologies keeps SMEs from implementing CBMs, and thus hinders their ability to benefit from 'circular' business opportunities (Rizos et al., 2015). Shortage of advanced technology can be an indication of low levels of innovation by SMEs but can also be a sign of insufficient access to financial resources to be able to cover the costs necessary for innovations that result in enhanced technologies (Zamfir et al., 2017).

### 2.6.2. Financial barrier

The literature often describes the financial barrier as the most prominent for the implementation of a CBM and is to a certain extent related to the technological barrier. Transitioning to a CBM requires large capital investments in production techniques to adjust them to CE standards while the returns of these investments are uncertain (Jesus & Mendonça, 2018). The high upfront costs that are associated with changing to CBMs are important for SMEs, since they are assumed to have less financial resources to cover these costs (Rademaekers et al., 2011; Rizos et al., 2015). The combination of high investment and unclear financial profitability act as an important barrier for SMEs to implement CBMs (Ritzén & Sandström, 2017; Jesus & Mendonça, 2018).

### 2.6.3. Institutional barrier

The possible effect of the institutional context on the implementation of CBMs by entrepreneurs is twofold. On the one hand, environmental legislation can enforce restrictions or regulations regarding certain aspects of the production process, such as chemical use, waste management, transportation and/or recycling opportunities. However, the changes necessary to comply to these regulations might be difficult to pursue since laws do not allow all (e.g.) alternative production methods or recycling techniques (Rizos et al., 2015; Jesus & Mendonça, 2018). On the other hand, the institutional context functions as an accelerator that enhances the transition to a CE by providing subsidies to firms implementing CBMs or having taxation policies in place that punish noncompliance with CE principles (Rizos et al., 2015; Stahel, 2010). However, without strict supervision, these policies will be useless which makes it difficult for entrepreneurs to enter an existing market (where, for example, profit maximization is the main goal). In both ways, the institutional context sets boundaries for the environment in which firms operate. The institutional context can serve as a barrier for firms continuing their 'non-circular' processes as well as firms wishing to transition to a CBM but regulations and bureaucracy make this transition difficult (e.g. permits, laws).

#### 2.6.4. Societal barrier

Finally, the societal context can be a hindering factor for the transition to a CE. Without societal demand for goods produced according to CE principles, there is insufficient incentive for entrepreneurs to use a CBM since this is often associated with higher production costs which will not be covered by increased demand and returns (Meqdadi, 2013; Rademaekers et al., 2011). Entrepreneurs are unlikely to take upon these high up-front investment costs if there is no market for their products. In addition to that, there is no reason for the entrepreneur to use a CBM if their current 'uncircular' practices are socially accepted (Suchman, 1995; Schein, 2009). In other words, raising consumer awareness and demand for circular products is an essential component in the transition to a CE. Ghisellini et al. (2016) propose a labelling system for foods, non-foods, and services that helps consumers to distinguish circular from non-circular products. Another method to raise consumer demand for circular products is proposed by Korhonen et al. (2018) and Ülkü & Hsuan (2017) who argue that collaborative consumption models are essential for the transition to the CE. A collaborative consumption model can be defined as a model in which individuals share the use or function of a service and/or product (sometimes referred to as the sharing economy) (Tukker, 2015). However, it should be acknowledged that ownership is an important issue in current developed societies and the loss of ownership, as a result of a collaborative consumption models, is one of the most prominent barriers impeding the implementation of such a model (Korhonen et al., 2018; Tukker, 2015). It remains difficult to determine how consumer behaviour can exactly be influenced in order for them to demand circular products/services (Liu & Bai, 2014). Nevertheless, entrepreneurs play an important role in stimulating consumer demand by developing circular products that are in line with consumer desires in terms of quality, pricing, availability etc. (Cooper, 2005; Ghisellini et al., 2016). Only when consumers perceive circular products as substitutes for linear products, it is expected that the societal barrier will gradually dissolve and consumers will contribute to the CE (van Weelden et al., 2016; Armstrong et al., 2015).

The societal barrier does not only relate to societal demand for 'circular' products but also refers to the wider context in which the entrepreneur operates and thus to supplier relations. Firms are dependent on suppliers' engagement in CE principles in order to be fully circular (Wooi & Zailani, 2010; Rizos et al., 2015). It is unrealistic to expect a firm to be fully circular in itself and thus produce all necessary resources and inputs within the firm. It is essential to establish a network of firms that together act upon the CE principles, which again highlights the important of system-thinking when analysing the transition to a CE (Raworth, 2017). This is inherently different from assuming a single firm has to be responsible for all parts of the production process in order to classify as a circular business. Therefore, a collaboration between firms can reduce the existence of societal barriers in the sense of supplier relations. Nevertheless, consumer behaviour and preferences remain important factors in the ability of firms to act in a network of circular firms (Jesus & Mendonça, 2018) and together produce according to CE principles.

#### 2.7. The role of geography in the transition to a circular economy

All of the aforementioned barriers and motivations for including CE principles in a business model can to a certain extent be influenced by the geographical location in which the entrepreneurs operate. Lacy & Rutqvist (2015) argue that individual organizations, despite industry-specific factors, market conditions or geography, must initiate the transition to a CE by acting according to CE principles, Geng & Doberstein (2008) argue that the effect of geography should not be underestimated. They state that companies located in the same geographical area are likely to have higher chances of collaboration to

collectively set a circular resource system in which by-products are exchanged between the firms. The difference in argumentation between these two articles lies in the perspective used regarding the geographical scale at which CE objectives can be achieved. Geng & Doberstein (2008) argue there are three systems through which CE can be implemented. First, the micro-level focuses on individual firm performance and the extent to which firms operate under CE principles (waste minimization, cleaner production, renewable energy use etc.) within the own production process (Murray et al., 2017). This is the same geographical level that Lacy & Rutqvist (2015) use in their analysis. However, Geng & Doberstein (2008) emphasize the importance of two other systems through which CE principles can be achieved. On the one hand, they describe the meso-level, which relates to the inter-firm level in which firms are located within a specific geographical area (such as is the case in eco-industrial parks) that enhances the ability to capitalise on trading by-products of production processes (such as excessive heat that can be used as energy for other firms or waste that serves as input for another product) (Hobson, 2016; Geng & Doberstein, 2008; Gregson et al., 2015). On the other hand, Geng & Doberstein (2008) mention the macro-level, defined as the societal context in which the firm operates. The macro-level considers both the production and consumption side that together affect the ability of firms to act according to CE principles (Murray et al., 2017). From the production point of view, the entrepreneur promotes the emergence of circular networks in which they operate and thus relates to the meso-level as discussed above. From the consumption point of view, the entrepreneur aims to promote consumer awareness to deter the demand for products produced by LBMs and encourage the reduction of total consumption and waste production (Geng & Doberstein, 2008). The macro-level thus differs from the meso-level in the sense that the macro-level focuses on both aspects of society; both production and consumption, whereas the meso-level solely focus on the production process.

#### 2.7.1. Co-location of firms and the creation of a circular network

Especially the meso- and macro-level perspective highlights geography as an important factor affecting the transition to a CE. One example that clarifies this is given by Hobson (2016) who argues that socio-political processes, which are explicitly geographical, have important implications for the emergence of industrial networks through which firms collectively work towards a CE. Parida et al. (2017) argue that distance to resources, market opportunities, and capital motivations are examples of motives for firms to seek economic partners and engage in networking. In addition to this, Belso-Martínez et al. (2017) argue that geographical concentration of economic activities is likely to contribute to the innovation capacity of firms, resulting in new techniques that can accelerate the transition to a CE and thus reducing the technological barrier as discussed earlier. Furthermore, geographical proximity facilitates material symbioses which is essential to create circular resource flows (Hobson & Lynch, 2016). Most of the research focuses on the benefits of geographical proximity at the meso-level, while the macro-level is of importance to achieve the triple-bottom-line that is aimed for by the CE. It is too simplistic to assume that planned colocation and agglomeration of firms will result in a CE in which firms continuously re-use and recycle products (Geng & Doberstein, 2008; Murray et al., 2017). The macro-level draws attention to the importance of emerging networks in both production and consumption, through which responsibility for achieving this triple-bottom-line is diffused to both the producer and consumer (Murray et al., 2017). The transition to a CE does not solely require innovative entrepreneurs who implement CBMs and adopt 'take-back' schemes to improve re-use and recycling of materials or establish networks with other firms to enhance industrial symbioses. It also requires a significant shift in consumer behaviour to move away from a system of consumerism and ownership towards a sharing economy characterized by temporary utilization of products and services (Gregson

et al., 2015; Heshmati, 2015). Policy instruments are often mentioned as important incentives to change consumer patterns (Hobson, 2016), facilitating firm agglomeration as well as enforcing regulations on production processes that fail to comply with CE principles (Kirchherr et al., 2017), once more highlighting the effect of regional and/or national policy on the transition to a CE (Hobson, 2016). In other words, the geographical context is the environment through which the societal, institutional, technological and financial context are influenced. These factors will determine the ability to construct a 'societal symbioses', which is an elaboration of industrial symbioses, in which both consumption and production factors are considered equally important to achieve a CE (Heshmati, 2015). It is expected that for the SMEs in the North of the Netherlands the effect of geography can be classified as important for facilitating the exchange of resources that cannot be transported over long distances. The relative small geographical area of the region facilitates the exchange of resources which discourages the need to transport goods over long distances, which contributes to the economic feasibility to recycle and/or reuse and collaborate with partners to do so.

## 2.8. Conceptual model

The conceptual model integrates and visualizes the most important concepts that have been discussed in the previous paragraphs into one figure (figure 6). The conceptual model functions as the foundation on which the data collection methods and analysing techniques have been determined.

The different types of entrepreneurs that are distinguished by using the various definitions as mentioned in section 3.3. (e.g. social-, ecological-, circular entrepreneurs) are considered one in this research. Despite some small differences in wording or terms used, the definitions of these types of entrepreneurial behaviour all address the issue that individuals do not solely act on behalf of economic conditions but also consider the social and/or environmental impacts of their actions (Hockerts & Wüstenhagen, 2010; Belz & Binder, 2015). The definition of a circular entrepreneur in this research is based on the idea of institutional theory which states that an institutional entrepreneur is a person that develops new institutions or products in such a way that meet their objectives (Anderson & Hill, 2004). In the case of a circular entrepreneur, this is someone who acts according to this definition while considering one of the three core objectives of a CE as mentioned in paragraph 2.1. Entrepreneurs can be focused on different CE principles and on different parts of the production process. This results in a wide variety of entrepreneurs that can be classified as circular entrepreneurs. For the sake of this research, all entrepreneurs that act on behalf of (one of) the CE principles are included and can be found in the conceptual model under the header of 'entrepreneurial behaviour' (this could include entrepreneurs who might also be classified as social and/or ecological entrepreneurs).

Entrepreneurial behaviour is influenced by elements such as technological-, personal-, financial-, institutional-, and/or societal context which all relate to the direct environment in which the entrepreneur operates (Autio et al., 2014). These factors can function as an enabler or barrier for entrepreneurs who want to implement CE principles. The entrepreneurial behaviour influences the entrepreneurial activity undertaken by the individual. The conceptual model focuses on six business model strategies that entrepreneurs can pursue to fit within the definition of a circular entrepreneur.

Furthermore, the figure shows the potential effect of the government as an institution that can influence entrepreneurial behaviour (Jackson 2011, 2017). The societal context is added to the conceptual model as an important pillar which can influence the transition to a CE in general as well

as entrepreneurial and governmental behaviour. Demands from the public domain that may come forward because of increased awareness on the necessity of sustainable alternatives to current practices/issues may force entrepreneurs to produce differently, or it may function as an incentive for entrepreneurs to act on behalf of the newly created demand (Hobson, 2016). The societal context also relates to the system in which an entrepreneur operates. Entrepreneurs are dependent on suppliers' engagement in CE principles to be fully circular which can influence their ability to act 'circular'.

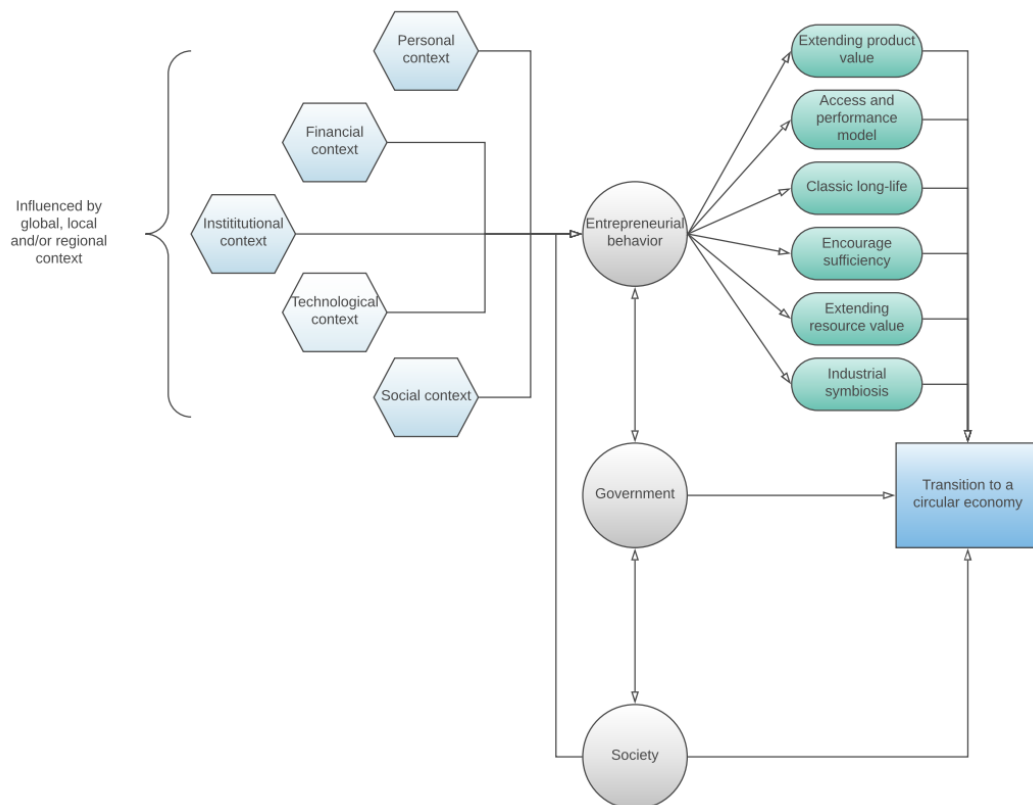


Figure 6: Conceptual model of how entrepreneurial behaviour can influence the transition to a CE

Based on the conceptual model and the data collection technique, the following expectations rise:

- Circular entrepreneurs aim to include the five core principles of a CE system: design for reuse, build resilience through diversity, rely on energy from renewable sources, think in systems, waste is food (symbiosis).
- A circular entrepreneur is an individual who exploits opportunities that exist because of market failures while acting according to (one of) the principles of the circular economy concept as given in paragraph 2.1.
- Due to the importance of various contextual factors, entrepreneurs will experience a wide range of barriers (e.g. lack of market demand, insufficient technologies, financial costs associated with investments) and enablers (e.g. government regulations, market opportunity, financially interesting) in the process of implementing CE principles in their business models.
- The closer entrepreneurs are located to each other in space, the easier it is to facilitate the exchange of knowledge and resources and stimulate a CE.

The expectations are discussed in chapter 5 (discussion chapter).

## Chapter 3: Research design and methodology

This chapter elaborates on the context in which this research takes place. It also describes the selected data collection methods as well as the technique used for analysing the data and how these have been designed to collate the information necessary to answer the research questions. Furthermore, this chapter addresses the challenges and limitations experienced during this research as well as some ethical issues and how these are handled.

### 3.1. Research context

This research is an explorative case study since an analysis of the motivations, challenges, and barriers of entrepreneurs for including CE principles at the SME level in the Netherlands has not yet been done before. The research aims to identify the motivations, challenges, and barriers experienced by circular entrepreneurs that are situated in the North of the Netherlands. The outcomes of this research add to the existing academic literature on sustainable – and circular entrepreneurship and offers interesting insights for policy development.

The theoretical framework has indicated several motivations, challenges, and barriers experienced by entrepreneurs implementing CE principles in their business model and discussed how geographical context can influence the ability of entrepreneurs to transition to CBMs. This research focuses on a specific geographical context to increase the understanding of this locational effect. The research has been conducted in the three Northern provinces of the Netherlands: Groningen, Friesland, and Drenthe. It is important to remember that such a specific case study leads to detailed outcomes that are tailored to the circumstances within that region and thus cannot be directly compared to instances outside the area of interest (Gerring, 2007). Therefore, it could be that this research does not find the full range of motivations, challenges, and barriers experienced by circular entrepreneurs simply because they are not present within this region.

### 3.2. Research Methodology

The data collection took place over the course of several months. The length of the data collection period was initiated to be only several weeks but the summer holidays and the difficulty of finding participants caused the need for a longer timeframe. Given the paucity of this research studying circular entrepreneurship that considers locational and geographical conditions and effects, this explorative study is based on a qualitative research design. This data collection method allows the researcher to study personal experiences, motivations, and challenges within its complex context in order to gain a holistic understanding of the entrepreneurial process to include CE principles (Dana & Dana, 2005; Baxter & Jack, 2008). This thesis tends to explore the potential effects of geographical context on entrepreneurial behaviour which requires an individualistic approach since contextual factors (e.g. social, institutional, financial etc.) vary between actors (Hennink et al., 2011). In total, 17 semi-structured interviews were conducted to be able to answer the research question. 15 of those interviews were conducted with entrepreneurs that include one or multiple CE principles into their business models and who are located within the three Northern provinces of the Netherlands. The total number of recruited participants is guided by the principle of saturation, which is used as the criterion to discontinue data collection since it identifies the moment in which information becomes

repetitive (Saunders et al., 2017; Hennink et al., 2011). After the interviews with the entrepreneurs were conducted, two interviews with experts from organisations representing circular entrepreneurs took place to validate the data through cross verification by addressing multiple sources. Besides validating the data, this idea of data triangulation serves as a way for the interviewer to gain a deeper understanding of the topic and participants being studied and thus contributes to a more in-depth analysis of the data (Taylor et al., 2016; Richards, 2015).

Secondary data has allowed the researcher to gain a greater understanding of the topic itself, the motivations of the entrepreneur to 'go circular' and the different ways in which entrepreneurs can choose to include CE principles in their business models (different types of CBMs, different aspects of the production process etc.). This deductive reasoning has led to an improved understanding of the researcher regarding the important concepts as well as provided the data analysis with a sufficient theoretical basis, while the inductive reasoning (gained by the semi-structured interviews) allowed for flexibility and to include issues raised by the interviewee during the interview that were not necessarily expected based on the literature analysis (Wohl, 2010; Dana & Dana, 2005; Gill et al., 2004).

### 3.3. Data collection

Participants for the semi-structured interviews were selected based on the individual's experience and connection to the topic of circular entrepreneurship. The researcher aimed to find enthusiastic participants that met the set criteria, rather than an equal number of interviewees in each of the three Northern provinces. This is in line with the objective of qualitative research, which does not aim to find a random or representative sample of the wider population but aims to create a greater understanding of individual's experiences by studying a certain phenomenon within a specific context (Valentine, 2005). Because of this, the outcomes of this research cannot be used for generalisations on this topic, but this is at the same time not desirable or preferable in this context. Since participants were chosen based on their characteristics relevant to this research, a non-random approach to recruit the participants was used. This is also known as purposive recruitment since only purposeful participants that met the requirements necessary to be able to provide in-depth information regarding the research topic were approached (Palinkas et al., 2015). Another advantage of recruiting the participants through this method is that it allows the researcher to select participants during the data collection process, rather than following a rigid procedure that was set out before the data collection started (as is often the case with quantitative research). Nevertheless, purposive recruitment as a way of recruiting participants does require a definition of the study population as well as the recruitment strategy used (Hennink et al., 2011). The study population in this research is defined as all entrepreneurs that meet the criteria of organising their business around one or multiple CE principles and are located within any of the three Northern provinces.

This research has used several recruitment strategies to find participants for the semi-structured interviews. First, online advertisement on social networks such as LinkedIn and Facebook was used as the initial strategy to find participants. Even though most entrepreneurs are active online to promote their services/products (Pooja & Saloni, 2015), it should be acknowledged that this recruitment strategy does introduce a bias since only entrepreneurs active on these social media sites are able to respond to the advertisement. The advertisement strategy did not yield many participants and thus served as an additional method to the other strategies used. In the second place, a network strategy was used and both informal and formal networks were addressed to find participants. The formal



network strategy focused on reaching out to organizations (Hennink et al., 2011) that represent circular entrepreneurs (such as Circulair Friesland, NICE and Groener Groningen). Not all those organizations could provide information on their population due to privacy reasons, which is a disadvantage of using this method. The informal network strategy focused on informal networks (e.g. Facebook groups). In addition to this, the professional network of professors of the Faculty of Spatial Sciences (University of Groningen) was used as an informal network through which potential participants were reached. Actively reaching out to entrepreneurs and addressing individual firms directly turned out to be the most effective and successful strategy to recruit participants. Finally, a snowballing technique was used by asking participants if they would know other circular entrepreneurs that could be contacted for this study (Marshall & Rossman, 2016). To provide enough variety in the context of participants, multiple participants from different types of companies and different locations were the starting point of this snowballing technique (Hennink et al., 2011). The snowballing technique did not yield many interviewees and thus the bias associated with this technique (limited random selection of participants) has been minimal (Heckathorn & Cameron, 2017). All potential participants were screened for eligibility for this research (by researching their business and/or directly contact the participant to discuss the content of this research). A combination of several recruitment strategies targeted at different types of participants has been used to broaden the pool of participants and minimize the biases of each of the used recruitment strategies (Hennink et al., 2011).

Before the interview took place, the researcher provided the interviewee with an informed consent upon which both parties agreed vocally (see appendix 1). This provided the interviewee with information on their rights to not answer questions or oppose the recording of the interview. The interviewee was informed that the data was treated in a confidential matter and would not be given to third parties without notice but that the findings of this research are openly available through the university website. Participants were informed about the fact that the University of Groningen requires that data used for the completion of thesis are stored for 7 years for validity reasons. The informed consent stated that the participant participated voluntarily and was able to terminate the interview at any time. In addition to that, the participant was given the opportunity to receive the outcomes of this research. Only after the participant agreed with these formalities, the interview was recorded. Almost all interviews were conducted during a personal meeting which allowed for an informal setting that fits the data collection method of semi-structured interviews. Only for one participant, it was not possible to meet in person and therefore that interview was conducted over Skype. One participant opposed to the recording of the interview and thus this interview was not recorded. During this interview, the researcher ensured to write down as much as possible and summarized these notes right after the interview to one coherent document that was used for the data analysis.

An interview guide was made and used to guide the interview (see appendix 2 and 3). The informal structure of the interviews permitted the researcher to further explore the interviewee's perception on certain issues that were not included as questions in the interview guide which has resulted in slightly different interviews with all interviewees. Nevertheless, the interview guide functioned as an instrument to ensure consistency in the content and topics covered, which enabled the comparability of the collected data. Almost all interviews were recorded and later transcribed verbatim as soon as possible after the interview. During and right after the interview was conducted, key themes that emerged during the interview, as well as anything noteworthy or interesting, were written down by the researcher and were used as keynotes in the analysis process.



### 3.4. Data analysis

To combine deductive reasoning (the theoretical basis) with inductive reasoning (the information that was given by the interviewees), a grounded theory analysis was used to answer the research questions and identify resemblances and differences amongst the interviews (Hennink et al., 2011; Bitektine, 2008). Grounded theory analysis allows the researcher to use the empirical data as the starting point of the coding process. The goal of grounded theory analysis is to allow for an inductive reasoning that aims to understand the data while positioning it in the context in which it was conducted. This fits with the research objective of this thesis to develop an explanatory theory of the motivations, challenges, and barriers of entrepreneurs studied in the environment in which these takes place (Charmaz & Belgrave, 2012; Starks & Trinidad, 2007). The transcripts of the interviews were analysed with *Atlas.Ti*, a software program that can be used to analyse qualitative datasets in a clear and consistent way. Codes and sub-codes that arose while transcribing the data were used to create a codebook and were later on compared to the theoretical framework as presented in chapter 2. To enhance the ability to interpret the findings, the codes were grouped in several ‘families’, which are overarching themes deduced from the research questions or from the information given by the participants (Attride-Stirling, 2001). This process of coding and grouping is similar to the schematic overview as depicted in figure 7.

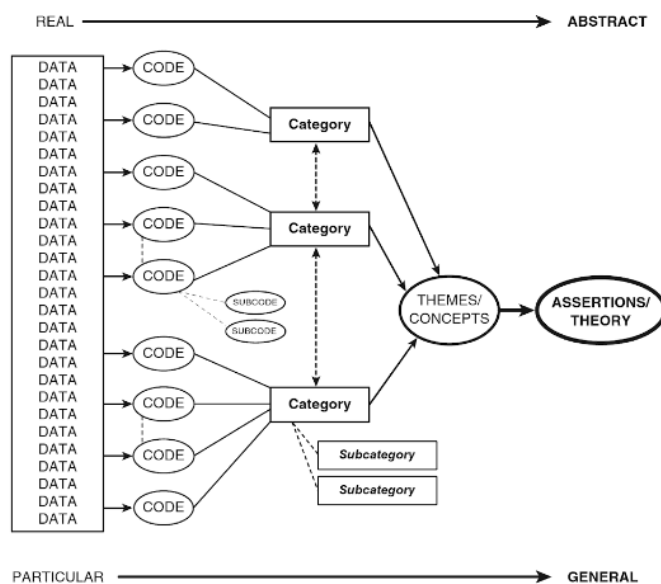


Figure 7: Schematic overview of the process of coding the collected data (Saldaña, 2016, p.14)

The process of coding the data was done as soon as possible after an interview was conducted to ensure no data was lost and served as the instrument to transition from data collection to data analysis (Saldaña, 2016). The process of coding was repeated several times to ensure all necessary information was gathered to answer the research questions and ultimately resulted in a coding tree.

### 3.5. Reflection on the research process

This paragraph touches upon some of the challenges and limitations that were encountered during the data collection process that could have introduced a bias that has influenced the quantity and/or quality of the data. Furthermore, attention is drawn to the ethical concerns that exist as a consequence of the data collection method and how the researcher has paid attention to this, and if possible, addressed these issues.

### 3.5.1. Challenges and limitations during the research process

During the research process, the researcher faced several challenges that influenced the data collection. In first place, it proved to be difficult to find participants for the interviews despite the recent increased interest for the topic of the CE. Most of the interviewees were found by directly approaching the firm/entrepreneur itself. Many efforts were made on behalf of the researcher to ensure that all interviewees met the requirements as were set at the beginning of the recruitment process. During the interviews, it appeared that some participants interpreted the CE principles in a slightly different manner than the researcher. As a consequence, the participants might not exactly meet the requirements according to the definition of a circular entrepreneur as is used in this research, which can be seen as a research bias. However, this research aims to produce an explorative case-study on a rather new topic within the field of Economic Geography and does not aspire to produce generalised findings that are immediately applicable to other topics or study areas.

The second limitation of this research lies in the definition of a circular entrepreneur used by the researcher. The use of a rather broad definition allowed for a wide variety of entrepreneurs that could be included in the research and this has resulted in widespread differences between entrepreneurs and their motivations, challenges, and barrier experienced in the process of transitioning to a CBM. The researcher recognises that this has influenced the outcomes of this research. Focusing on or two specific economic sectors could have given a more detailed insight into the contextual factors of that sector that hinder or facilitate the inclusion of CE principles in a business model. However, due to the explorative nature of this research, it was not possible to give an indication of the most interesting sectors that should be examined and therefore it was decided to not limit the recruitment of participants to certain sectors.

In third place, a limitation regarding the quantity of the collected data can be identified. The number of semi-structured interviews conducted during the research period could have been more than the 17 that were analysed for this research. The number of interviews conducted at the beginning of the data collection period was less than initially forecast due to the difficulty to find participants. The researcher put great effort into finding participants during the summer months which ultimately ensured enough participants to provide information for the analysis and to overcome the issue of the number of interviews conducted.

In fourth place, the researcher experienced some challenges in conducting the interviews itself. Despite careful preparations, it could be that the initial interviews were conducted in a slightly different manner than the later ones. The researcher is aware of the implications this could have on the collected data. Nevertheless, the interview guide has served as an instrument to ensure consistency and coherence regarding the topics covered in all interviews. In addition to this, the interview skills of the researcher developed over the period in which the interviews were conducted. Insights gained during the first interviews led to more structured interviews later on in which the researcher aimed to better concentrate the content of the conversation towards the relevant topics.

Finally, the fact that the interviews were conducted in Dutch has introduced a bias since the results are presented in English and thus quotes had to be translated from Dutch to English. The researcher aimed to translate the quotes directly to ensure no information was lost and the content represented its initial meaning. However, translating the transcribed interviews might take away some of the

deeper meaning since always some meaning is lost in the translation process. This is not only due to the translation issue but also concerns the fact that facial expressions and body language cannot be transcribed (Padgett, 2017).

Other biases that may have existed during interviews between the interviewer and the participant can be seen as a result of the unequal relationship between these two, embedded in gender, power, knowledge and /or experience in the field (McLafferty, 2010). These factors may have influenced the data collection of which the researcher is aware.

### 3.5.2. Ethics

The issue of ethics has become increasingly important in doing academic research and fieldwork. Three core principles for ethical conduct are used as guidelines for this research. First, participants were treated with respect and have been thoroughly informed about the purpose and aim of the research and their rights during the interview. In the second place, the researcher intended to not do harm to the participants by protecting their privacy (Bloom & Craptree, 2006). After the participant gave consent to record the interview, the researcher ensured that the data has not been used in any other way than this thesis. Nevertheless, the interviewees were informed about the fact that the final product of this research is openly available. Finally, the researcher has strived for a research process that is non-exploitative. To comply with these principles, the researcher explained the research process and interview procedure to the participants. This served as a tool to inform the participants about their rights and provided information about the further research procedure and the use of their data (Jupp, 2006). After this explanation, the participants gave vocal consent for the interview. The researcher has strived for protection of the identity of the interviewees by ensuring the recordings of the interviews were stored in a safe and secure manner to create confidentiality and to prevent access to these recordings by third parties (Hennik et al., 2011).

### 3.6. Overview of the interviewees

In total, 15 interviews with entrepreneurs were conducted. Table 2 gives an overview of the interviewees, in which the P stands for Participant and the number that follows is one randomly assigned during the analysing process. P1 to P15 are the entrepreneurs that are interviewed and P16 and P17 represent the experts from organisations representing circular entrepreneurs in the North of the Netherlands. Table 2 also gives information on the economic sector in which the entrepreneur is active. This classification is based on the SBI (Standard Industrial Classification) codes that are developed by Statistics Netherlands (CBS) for the categorization of businesses to economic sectors (CBS, 2018a). The economic sector in which the participant operates is based on the primary categories that can be found in the SBI and thus does not fully specify the entrepreneurial activity of the participant. The information on the economic sector mainly serves as a way to position the responses given by the participants in the contextual framework in which that person operates. Some participants operated in multiple economic sectors and in those cases, both sectors are mentioned in the table. Furthermore, table 2 also provides some detail on the dominant CE objective acted upon by the entrepreneur, and the geographical location of the firm (degree of urbanisation and whether or not the entrepreneur is co-located with partners). This information increases the understanding of the responses given by the participants in relation to the effect of location factors on the ability to include CE principles in their business model.

Table 2: Overview of the participants and relevant additional information regarding their business

<b>Participant</b>	<b>Economic sector</b>	<b>Dominant CE objective(s)<sup>1</sup></b>	<b>Degree of urbanisation (of the firm location)<sup>2</sup></b>	<b>Co-location of firms<sup>3</sup></b>
<b>P1</b>	Manufacturing	Reduce	Not urbanised (5)	Not specifically within the region
<b>P2</b>	Manufacturing Consultancy	Reuse Recycle	Extremely urbanised (1)	Not specifically within the region
<b>P3</b>	Manufacturing	Recycle	Strongly urbanised (2)	Partners within the region, not co-located
<b>P4</b>	Manufacturing Consultancy	Reduce Reuse	Strongly urbanised (2)	Not specifically within the region
<b>P5</b>	Agriculture, forestry and fishing Electricity, gas, steam and air conditioning supply	Reduce Recycle	Not urbanised (5)	Partners within the region, partly co-located
<b>P6</b>	Water supply, sewerage, waste management and remediation activities	Reuse	Strongly urbanised (2)	Partners within the region, not co-located
<b>P7</b>	Manufacturing	Reuse	Strongly urbanised (2)	Not specifically within the region
<b>P8</b>	Construction	Reduce Recycle	Extremely urbanised (1)	Not specifically within the region
<b>P9</b>	Electricity, gas, steam and air conditioning supply	Reduce	Moderately urbanised (3)	Partners within the region, not co-located
<b>P10</b>	Agriculture, forestry and fishing	Reduce Recycle	Not urbanised (5)	Partners within the region, partly co-located
<b>P11</b>	Water supply, sewerage, waste management and remediation activities	Reduce Reuse	Moderately urbanised (3)	Partners within the region, partly co-located
<b>P12</b>	Consultancy	Reduce	Strongly urbanised (2)	Partners within the region, mainly co-located
<b>P13</b>	Culture, sports and recreation	Reduce Reuse	Hardly urbanised (4)	Not specifically within the region
<b>P14</b>	Consultancy	Reduce Reuse	Strongly urbanised (2)	Not specifically within the region
<b>P15</b>	Water supply, sewerage, waste management and remediation activities	Reduce Reuse Recycle	Moderately urbanised (3)	Partners within the region, partly co-located
<b>P16</b>	Expert			
<b>P17</b>	Expert			

<sup>1</sup> As defined by the researcher and participant during the interview

<sup>2</sup> Based on the degree of urbanisation as defined by Statistics Netherlands, see appendix 4 for an explanation of the categories

<sup>3</sup> Co-location of partners as defined by the researcher and participant during the interview

## Chapter 4: Results

This chapter presents the main findings of this research. Every paragraph relates to one of the sub-questions in order to provide a clear structure in the presentation of the findings.

### 4.1. The role of the entrepreneur in the transition to a circular economy

In order to answer the first sub-question: *“What is the role of the entrepreneur in the transition to a circular economy?”* it was necessary to first identify the perception of the interviewees towards the conceptualization of the CE. There is no single, uniform definition of a CE and therefore participants were asked about their perspective of a CE to understand what they define as a CE (paragraph 4.1). In addition to this, participants were asked how they would describe the possible contribution of the entrepreneur to the CE and the answers to this can be found in paragraph 4.2.

#### 4.1.1. Defining the circular economy

The interviews commenced with a discussion on the definition of a CE. All participants noted that giving a definition of a CE is a rather complex matter. However, one central theme that often recurred was that the concept explains itself since the word circular inherently means that the net effect of production is per definition zero, or even better, positive (P6). One participant exemplified the principle nature of the concept of the CE by saying *“if you say circular, it means the head connects to the tail”* (P8). Similarly, participant P11 also emphasizes the fundamental need to constantly reuse resources in the future as the foundation upon which the CE is based. One participant (P12) also noticed that a CE does not only focus on producing without generating waste but also on the ability to use resources of product X to produce Y. This system thinking was mentioned by more participants as an important part of the definition of a CE. For example, P6 notices that the output of one firm can serve as the input for another firm that produces goods and/or services that do not directly relate to the initial use of the resource. Another person (P13) also accentuates the need of system thinking by saying that *“without system thinking you are just not circular. Circularity literally means a circle. If your product eventually ends up in the incinerator it is not circular”*. Eight participants emphasized the importance of cross-sectoral thinking in this concept of system thinking to allow entrepreneurs to look beyond the own product chain (P15) to facilitate the exchange of resources. They argue that not all resources might be able to reuse within the own sector but that those resources could function as input for other sectors.

Due to the variety in interpretations of the concept of CE, participants were asked about their perspective on the concept of sustainability and to what extent this differs from the CE. Two major differences between the concepts of sustainability and circularity were given by several (10) participants. On the one hand, sustainability is more associated with doing less harm rather than doing good. One person (P13) illustrates this by saying: *“sustainability implicates that you are changing an existing system. If you do 10% better than how it is done now, so actually 10% less bad, you are considered sustainable. But what it actually means is that it is still wrong for 90%”*. Participant P13 adds to this that the CE is more focused on changing the underlying issues that lead to an unsustainable economy, rather than limiting or altering the negative effects as a consequence of this economy. On the other hand, participants mentioned a time perspective as an important point of difference

between the two concepts. One participant illustrates this by arguing that *“the circular economy is a way to be sustainable in the long term”* (P14). The concept of CE was seen as way to apply the underlying notions of sustainability to real world phenomena (P15). One participant had a slightly contradicting perspective regarding the conceptualization of a CE and illustrated this by saying *“I don’t think that the circular economy is the solution or is something that should be aspired. I see it as means. It is an approach. What would you like to accomplish? Would you like to create a healthy world? By approaching things through a circular vision that is what you accomplish”* (P14). This person accentuates the CE as a concept that can be used to achieve other aspirations (which is, in this case, a healthy world). However, in both cases, the CE is seen as a way to conceptualize aspirations (e.g. sustainable or personal ones) into real-world phenomenon through entrepreneurial action.

All participants indicated the need for an alternative economic model that does not harm the environment, which is described by one as follows: *“The circular economy is of course a beautiful school of thought. Everybody wants to have that circle closed. [...] it’s just, we do not need to have that discussion”* (P7). Correspondingly, another person states that *“oh I am convinced it (the CE) will happen. No doubt about that”* (P2).

In general, participants reported several themes in defining the CE. An overview of the major points of interest as mentioned by participants concerning the definition of a CE can be found in table 3.

Table 3: Presentation of the aspects that are considered as essential parts of a CE by participants

<b>Aspect of a circular economy</b>	<b>Description</b>	<b>Mentioned by ... participants</b>
Close the circle	Fundamental part of the word circular is the closing of a system	10
One form possible	Due to the fundamental nature of the word circular only those who meet this aspect in all parts of production are considered circular	6
No value deterioration of resources	Resources never end up in the incinerator since this will mean decapitalization and value deterioration	6
Return waste in production process	Waste produced in one part of the process reintegrated in other parts of the production process (or that of other firms)	4
No withdrawal of resources	Resources should not be withdrawn from the earth or from the production process	6
No environmental damage	Production of goods/services should not harm the natural environment in any way	10
System thinking	Essential for the CE is to consider the system in which the firm operates, both intrafirm (optimize own production process) and cross-sectoral (output of firm X as input for firm Y)	12
Collaboration	Essential to work together in the entire product chain to create a CE. The individual firm is (almost) never able to produce entirely circular products themselves	15
Sharing economy	Economy should no longer be centred around ownership but about the usage of products and services	6
Upcycling	Increase the economic value of resources by using them in the production of other products once they are considered ‘waste’ by another firm	10

#### 4.1.2. The contribution of the entrepreneur to the circular economy

All participants agreed upon the fact that the entrepreneur can actively contribute to a CE. One participant indicated the responsibility of the entrepreneur by saying: *“In the end, we are the ones producing our products. Therefore, we have the responsibility to change our production process. [...] The entrepreneur is a link in a web, together with buyer and producer”* (P4). This quote can be associated with the aspect of system thinking that was mentioned by various participants as an important pillar of the CE (see table 3). Another participant mentioned that the role of the entrepreneur lies in adjusting its business model in a way that it becomes sustainable for the future, in both environmental and financial terms. The person acknowledged that this kind of change is rather difficult but should be seen as an opportunity for entrepreneurs to differentiate themselves from others (P3). This idea of potentiality is shared by P16 who states *“the CE is popular now, it something you want to be part of [...] it’s a chance to show you are different and concerned about social and environmental issues and you are not just an entrepreneur to earn money”*. Some participants even mentioned that it is essential for entrepreneurs to adjust to the circular economy in the future (P6). One participant illustrates this by saying: *“firms that do not start, not commence with the circular economy, they won’t have a ‘license to operate’ in the future”* (P3). Participants assigned the entrepreneur the role of seeing opportunities that exist in the CE (P14, P15). This vision is shared by another participant who mentions that *“the entrepreneur, he/she is innovative, that should be the initiator. That is the fundamental role of the entrepreneur”* (P11). However, how the entrepreneur actually acts upon implementing CE principles in their business model differed between the participants and a further elaboration on this is given in paragraph 4.2.

In conclusion, participants mentioned several aspects in defining the CE and thus their definitions of the concept slightly differed. Important indicated components of a CE were the collaboration with others, limit environmental damage, reuse resources and the closing of networks. The participants indicated that the CE is fundamentally different than the concept of sustainability since it requires firms to ‘do no harm’ or ‘do better’, whereas in the concept of sustainability it remains possible to ‘do less bad’. All participants ascribed the entrepreneur an important role in the transition to a CE since they are the ones producing the goods and services used in the economy. In fact, some participants mentioned that the CE is an inevitable development and it is essential for firms to act upon CE principles in order to be successful in the future as well. This vision is shared by P16 who also ascribed the entrepreneur an essential role in the transition to a CE and illustrates this by saying *“I think the entrepreneur has a key role, they are already much more into this than the government. They want it and they are already working on it. [...]. And it is logical, they are the ones responsible for a lot of pollution issues and they want to fix it”*. Hence, the entrepreneur is seen as an actor both responsible for (some of the) environmental issues of today but also as a key factor in providing the solutions to them.

#### 4.2. How to include aspects of the circular economy in a business model

This paragraph presents the findings related to the second sub-question, namely *“How and to what extent do entrepreneurs include CE principles in their business models?”*. It should be recognized that due to the variance in perceptions towards defining the CE participants can have different attitudes towards what is considered a CBM. Therefore, some variation might exist in the definitions of the various types of CBM.

#### 4.2.1. The circular economy included in the business model

This paragraph presents the findings related to the first part of the sub-question that addresses the issue of how entrepreneurs include CE principles in their business models. Participants displayed varying levels of awareness on how exactly they include CE principles in their business model. For one participant, the inclusion of CE principles followed as a logical consequence of addressing a different matter. The person stated that *“we started thinking about what do we find important? [...] I don’t think that ‘making things’ circular is the solution. I see it as means. I see it as an approach. What do you want to accomplish? Would you like to contribute to a healthier environment and society? By doing things in a circular way, that is what you accomplish”* (P14). Thus, this participant did not focus on including CE principles in their business model as a starting point but saw it as a direct consequence of their business vision. Another participant stated they also did not know how to exactly transition to a CBM and illustrates this by saying *“the power of substantial change is that, beforehand, you do not really know how things are going to work out. If we want to change the current system and redesign our society, you need to be able to think freely. [...] Only if you do not know you can actually develop new ideas or solutions”* (P12). For this person, the ability to transition to a CBM relates to the fact there is no pre-set definition of what a CBM entails. The person adds that in order to change to a CBM, a business needs to start from the beginning to immediately put CE principles at the core of the business strategy. A similar opinion was shared by other participants who stated that *“you can better change something completely on a small scale rather than changing a minor detail on a large scale”* (P8) and *“we have to move from small to large scale and not the other way around. There is a lot more benefit of four, five small initiatives and develop those initiatives to a higher level. That is far more effective than when you want to change something on a large scale”* (P15). Other participants emphasized that not every firm has the ability to radically change the business model to include CE principles and start from a small scale. Some participants specifically focused on the scale of the business as something that affects the ability to include CE principles in the business model. One participant describes this as *“I always realized that if I want to make a change, I need business volume [...]. We are still a relatively small business but we do have the volume and if you have volume you are in a position you can create what you would like to see (=CE principles)”* (P11). This vision is shared by another participant who mentions that it is impossible to change an entire society or economy when you are operating on a small scale. The person also emphasizes that it is easier to include CE principles in the business model if the firm operates at a larger scale since it will have more resources to facilitate the inclusion of CE principles in an existing business firm (P5).

As can be derived from the findings above, the thought of how to include CE principles in a business model varies among the participants. A more detailed description of the types of business models of the participants will further elucidate on how entrepreneurs act upon the CE principles.

#### 4.2.2. Types of circular business models

This paragraph gives an overview of the extent to which entrepreneurs include CE principles in their business models and therefore addresses the second part of the sub-question as stated in paragraph 4.2. The business models of the participants are classified on their ‘level of circularity’ based on the framework provided by Bocken et al. (2016) (see §2.4) which offers six types of CBMs that include one or multiple CE principles. Figure 8 gives an overview of the participants over the different business model strategies. It should be noticed that the figure is based on a total of 17 business models instead of 15 (which is the number of participants), this is a result of two participants that could be assigned



to two business models and thus are included twice in the figure. The business model of P5 could be classified as both the extending resource value model and the industrial symbiosis model. The business model of P3 could be classified as both an access and performance model and classic long-life model.

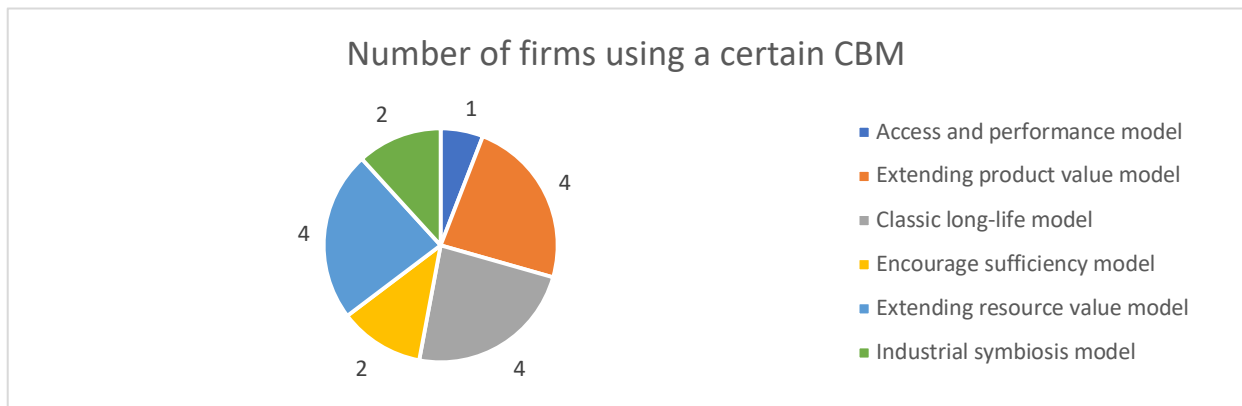


Figure 8: Overview of the business models used by the participants

Figure 9 shows there is no clear relation between the type of business model and the sector in which the model is prevalent. There is no indication a certain business model is associated with a specific industry. However, it is important to notice that the classification of economic sectors upon which the figure is based is determined on the primary SBI codes developed by Statistics Netherlands. These codes serve as an indication of an entire economic sector and thus do not show intersectoral differences regarding the type of business of the participants. If a more detailed classification of the products/services was used, it could be that a relation between the economic sector and the type of business model was found. This could provide interesting information for other entrepreneurs operating in the same economic sector who could adopt to a certain CBM.

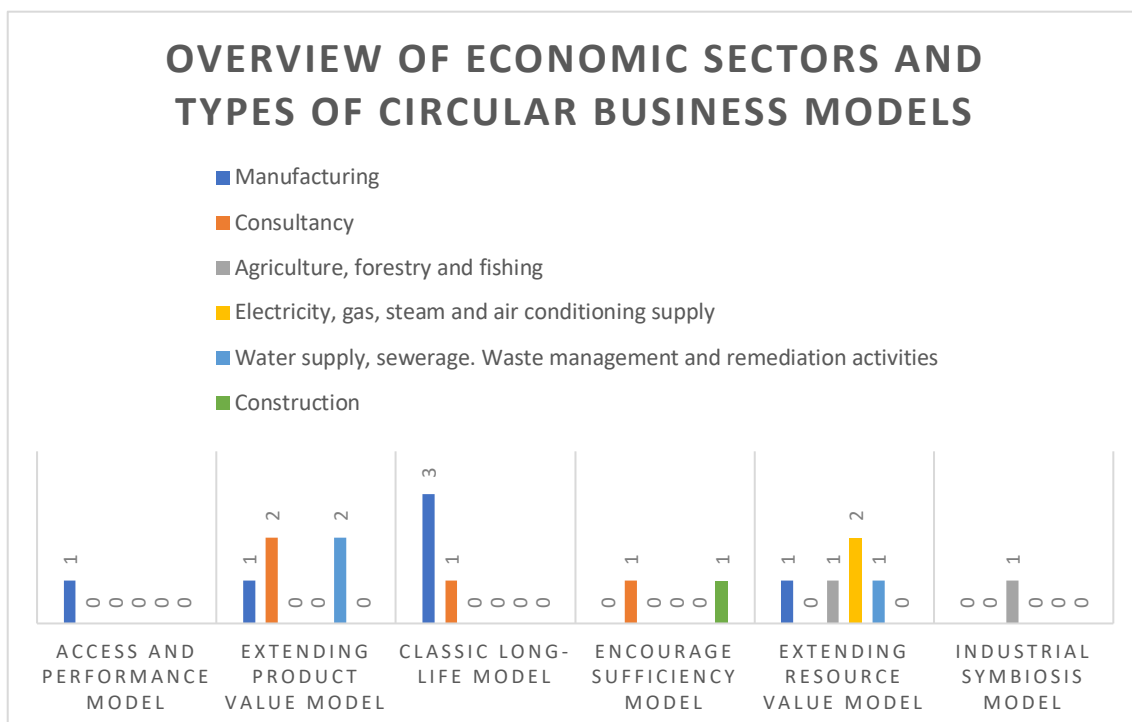


Figure 9: An overview of the different types of CBMs and how frequently these models are used in the different economic sectors in which the participants are working

Participants were able to describe their business model but variation existed in how they saw the link between that business model and the transition to a CE. One participant mentioned that even though the business model is oriented towards developing 'circular' solutions for others, their own business is not yet considered fully circular (P6). This issue was also raised by another participant who stated that *"I can tell you something about how we handle the topic of the circular economy, what we notice in the market and how we react to that [...] but if you ask how circular are you as a business, well, about those aspects I cannot really say something"* (P2). In line with this, another participant stated that *"I wanted to install solar panels on our roof [...] but in the end it was not possible. In that sense I am not doing any better than 'normal' firms"* (P7). This shows that, despite the fact the person considered their business product and - model circular, the firm itself was not seen as more circular than a traditional firm by the participant. According to P17, the business model of P7 would not be considered as a fully CBM. The person states that the definition of the CE requires a firm to act upon a range of factors that include the produced output of the firm as well as the use of renewable energy, having a positive ecological impact, focus on the social aspect of production etc. In other words, this person argues that not all business models as described by Bocken et al. (2016) should be considered as a CBM. These different visions on what a CBM entails are a result of the variations that exist in the definition of the CE used by the participants.

Despite the complexity surrounding the extent to which a firm includes CE principles in their business model, the far majority of the participants indicated they would like to continue working on developing more circular products and/or services. One participant indicated this as follows: *"If you want to help or influence other businesses you need to know how things work in a business. So that is what we have done, we started learning. Now we are ready to further develop the concept and stimulate others. [...] The goal is to contribute to the circular economy in the Netherlands"* (P10). Another participant mentioned that *"We try to help our clients to figure out what is already possible. Maybe they didn't think about issues such as responsible entrepreneurship and the circular economy themselves. We aim that those issues are now taken into consideration in all processes and challenges that the client faces"* (P14). Correspondingly, another participant mentions that *"I would like that what I do has had an impact on how somebody else makes a decision. The goal is actually to create some awareness [...]. Or not only awareness but that what I do also motivates others to action."* (P13). One participant emphasized that *"in the future, I would like to bring parties together to really collaborate and find circular solutions. That is what we would like to focus on [...], to be the centre in a web of actors"* (P11).

Despite the willingness of many participants to actively work on the transition to a CE, some indicate that they are still developing their 'circular' products and/or services. Therefore, almost all participants emphasized that they aim to further develop their business model towards circularity in the future. The findings show that how and to what extent entrepreneurs include CE principles in their business model is a rather complex question that demands a holistic understanding of the context in which the firm operates. A further elucidation on the contextual factors that affect the ability of the entrepreneur to include CE principles in their business models is given in the following paragraphs.

#### 4.3. Motivations for including CE principles in the business model

This paragraph presents the empirical findings that address the third sub-question: *"What are the most important motivations for circular entrepreneurs to include one, or multiple, CE principles in their business model?"*. Every subparagraph contains the main findings regarding a specific motivation.

#### 4.3.1. Ecological motive

From the transcribed interviews, it was found that eight participants mentioned an ecological motive for including CE principles in their business model. An ecological motive was defined as reasons for including circularity as a way to generate positive environmental impact, or in the least minimize the negative environmental consequences of their entrepreneurial actions. One participant mentioned that their business product stimulates clients to search for nearby partners who can help them close their resource cycle (P3). Another participant exemplifies this by saying *“You could drive a long way to recycle a certain resource in the most efficient way but it might be better to burn those resources, to generate energy, and leave it in your own area. It is way less harmful to the environment to burn it here than drive hundreds of kilometres for recycling”* (P11). Another participant whose business is focused on developing techniques for improving existing machinery stated that: *“You can also repair an older machine. Maybe your energy costs are slightly higher than when you buy a new machine but you will have a much lower CO<sub>2</sub> footprint. By repairing your machine you can minimize your CO<sub>2</sub> footprint by 50%”* (P7). This quote shows that the person sees their business model/product as a way to postpone the demolition of machines to reduce the CO<sub>2</sub> footprint.

Besides reducing carbon emissions, participants mentioned other types of ecological motives as a reason for including CE thinking in their business model. One participant saw their business product and – model as a way to bring back balance and stated *“Our product can increase the quality of the soil which leads to healthier crops, less chemical use, reduction of fertilizers. Agricultural products that were produced on those grounds should be given to our children [...] We have caused a disturbance in the soil by using all those products (fertilizer, chemical use etcetera) and I want to bring back the right balance”* (P9).

One participant mentioned that circular entrepreneurship is a tool that will benefit both people and the planet since *“Currently we throw all this rubbish into nature and, plastic is an example of that, everything comes back to ourselves through the food chain. Another example is all those antibiotics they give to cattle, it infiltrates in the groundwater and eventually comes back in our foods. So, if you want to live a healthy life, we will need to take action. [...] We need to work on new solutions”* (P12). This person saw circular entrepreneurship as a way to change societal standards (e.g. reduce the use of antibiotics in the meat industry) which will subsequently have positive environmental effects. Another participant mentioned the greenhouse effect as the reason for developing a business product that reduces the need to use fossil fuels. By developing alternative types of fuel, the person aimed to reduce the dependency on fossil fuels and, consequently, reduce the negative environmental effects of the greenhouse effect (P1).

Despite the variance in ecological motives mentioned by the participants, all of them saw the urgency to change current practices to minimize the negative environmental effects of the entrepreneurial activity. All participants stated that the current economic system does not have enough attention for those negative effects. Circular entrepreneurship was mentioned as a way to integrate the ‘do no harm’ perspective into entrepreneurial activity and stop the negative environmental consequences of entrepreneurial actions, or possibly generate positive environmental effects (P16, P17).

#### 4.3.2. Social motive

A different type of motivation for including CE principles in a business model is often associated with generating a product or service that has a social benefit. Around half of the participants mentioned a social motive as a reason for including CE principles in their business model. Of those participants, the majority mentioned the inclusiveness of people with a distance to the labour market as their main social motives. One participant exemplifies this by saying *“We need to earn money. We want to leave a positive ecological footprint, but the social aspect is also really important. We want to hire people with a distance to the labour market to assemble and install our products”* (P3). A similar vision was given by another participant who emphasized their business product offered as a way to improve labour market integration of people who are not able to find a job in the regular labour market. The person declared: *“If you look at labour market integration, you can use our product for that. In that case, it is not so much about the product itself actually, but more about providing people with a useful way to spend their day. There are so many opportunities to be circular and to bring back people into the labour market”* (P10). Another example of a social motive to include CE principles in the business model was given by P15 who stated *“We want to generate work. We want to contribute to the local economy and employment opportunities for people [...]. Here in the Northern part of the Netherlands, well we have to be honest, there is not that much work for people. It is our ambition to not just only recycle our own resources but also develop in multiple ways and generate employment opportunities”*.

A different perspective on the social motive and circular entrepreneurship was given by a participant who stated *“You can have a really circular business but in that business still treat people in such a way they end up having a burn-out or that they do something they are not good at. For me, it is that human perspective we need to put at the centre again. [...] If we change our economy and our society in such a way that it benefits all individuals, it will automatically also benefit the environment”* (P12). This quote shows that for this person, circular entrepreneurship is not directly associated with a social purpose or objective of a firm but that the social motive should be at the core of any business.

In conclusion, around half of the participant saw generating a social impact as an important motive for including CE principles in their business model. The social benefit that can be generated by, for example, hiring people with a distance to the labour market was often associated with a certain aspect of their business model that contributes to the CE (e.g. disassembling or sorting products to facilitate the reuse of resources). Interestingly, P16 did not directly associate circular entrepreneurship with social motives. For this person, circular entrepreneurship was mainly associated with the ecological motive and did not directly link to any social aspect. The person stated *“with circular entrepreneurship I don’t think anybody thinks about labour participation for example”*. This differs from the perspective of the interviewed entrepreneurs who do often mention the link with the labour market and the need to include people with a distance to the labour market in a firm with a CBM.

#### 4.3.3. Government restrictions as a motive

Only four participants mentioned government regulations as a motivation to act upon CE principles. Two of those four participants worked in semi-governmental organisations who acted upon the laws and regulations set out by the government. In fact, their business partly exists because the government imposes strict regulations regarding the collection, recycling, and processing of resources. One participant exemplifies this by saying *“The government sets out the national policy and has been focused on the circular economy and everything for ten years. That means that municipalities*

*automatically have to comply to the ambitions of the national government. Our job is to carry out those ambitions for the municipalities.”* (P6). Similarly, another participant mentioned the enforcing role of the government as follows *“The percentage that municipalities need to work on sorting and recycling resources is imposed by the national government. It is our challenge to take up on that challenge and work together with municipalities to meet the criteria [...]. But it all starts with policy. Without strict policies, nobody would even collect plastics for recycling. It is too expensive to collect plastics separately, process them, upcycle them, it needs money to be viable.”* (P15). This person stated that government restrictions were essential to set up their business related to waste management. The role of government restrictions was also mentioned by P17 and P14 who emphasized that strict regulations can indeed force entrepreneurs to include CE principles in their business model, and thus can be seen as an important motivation for transitioning to a CBM.

All participants indicated that the role of the government is twofold. On the one hand, the government should facilitate the entrepreneurs actively working on the transition to a CE. One of the participants illustrates this by saying *“If there are circular initiatives, I think the government needs to support these initiatives. Only on a short-term basis, I am not in favour of subsidies but yes, initiatives should receive some form of short-term support. Most of the time the most important and costly stage of setting up a business is the research phase. It only costs money but no revenues are earned. That’s where I see a role for the government”* (P11). Correspondingly, another participant stated *“We do use subsidies for our business because there are a lot of things that need to be researched and developed. So, we did get subsidies for that but it is important to notice that was for developing our business product, not so much the end product itself”* (P9). P16 also mainly ascribed the government the role of facilitator and illustrates this by saying *“I think the government needs to facilitate entrepreneurs who want to become or be more circular. They need to develop the rules in such a way that it actually becomes possible to experiment with new products or ideas”*. On the other hand, the government was seen as the institution that could impose stricter regulations for firms that do not act upon CE principles. One participant illustrates this by saying *“The role of the government should be that they oblige traditional, regular firms to include a certain share of recycled material in their products”* (P3). A similar opinion was shared by P13 who states *“I think there can be much stricter regulations. There is this ongoing discussion about a CO2 tax on products. I personally think: bring it on! If that is imposed, businesses need to switch and they will. Otherwise, it remains too expensive. In that sense, I think the government can have a very important role”*.

All participants indicated that governmental actions are essential to further stimulate the transition to a CE. Businesses who do not act in line with CE principles should be penalized and governments should actively work on achieving its own goal of having a CE in 2050 by, for example, giving their tenders to circular firms (P4, P5). This vision is shared by P16 who states that the government can do more to meet its set goal for 2050 by actively seeking circular businesses/entrepreneurs for their acquisitions and illustrates this by saying *“right now, the government is still mainly oriented towards the lowest price. If they want to have a circular economy they need to act upon this through their own actions and thus not always use price as the most important indicator”*. Nine participants indicated the stimulating role of the government in the transition to a CE. Nevertheless, there remains room for improvement. One participant illustrates this by giving an example of a recent setting in which the government could have been more circular through their actions: *“Some time ago, someone from the province came here and discussed with us the whole issue of the circular economy. I showed him that we could repair certain*

*machinery components and that would mean a lower need to replace some machines. I had just read that the province bought new machines for snow removal so I asked him, why did you do that? His answer was that all the salt and snow in winter times affected the machinery and so the province decided to buy entirely new machines. But only one or two components in the whole machine were affected by the salt and snow, so I said, you should have brought it to us and we could have easily made it resistant to those negative effects. You did not have to buy new machinery.” (P7).* This quote shows that not (yet) all layers of the governmental institutions itself are aware of the possibilities to contribute to this. P17 argues that for Friesland this is slightly different since all governmental levels (municipalities, provincial, and several national institutions) have signed the agreement to actively work on the transition to a CE and included these objectives in their coalition agreements.

The findings presented above suggest that government restrictions were not seen as an important motivation for including CE principles in the business model by most participants. The far majority of the participants assigned the government an important role in the transition to a CE, both through facilitation and limitation of respectively circular and linear businesses. Policies and regulations should force businesses to include CE principles if they do not voluntarily do so themselves.

#### 4.3.4. Market opportunities as a driver for a circular business

For some participants the inclusion of CE principles in their business results from the fact there are market opportunities in ‘being circular’. One participant illustrates this by saying *“We are a business who operates in the higher market segments. Therefore, we have a lot of pressure to be different from our competitors. [...] We see the CE as a way to be different, as a chance to be unique” (P4).* This person saw the inclusion of CE principles in the business model as a tool to generate positive environmental effects as well as an interesting business opportunity.

The CE offers opportunities for entrepreneurs according to P14 who states *“Chances! Opportunities! Definitely opportunities. There is demand from society, from consumers, that means that businesses and entrepreneurs need to act upon that demand. That is definitely a trigger”.* Another participant argues they are currently anticipating on future demand by saying *“Currently, we see the market is really struggling with the circular economy. There is not much demand yet but we think this will definitely change. When that moment comes, we want to know what it is, what it means, what it doesn’t mean, how we can deal with it. [...] We really see it as a market opportunity, anticipate future demand” (P2).* Another example of the chances a CE offers to entrepreneurs is given by P3 who states *“there are so many opportunities for entrepreneurs because you can distinguish yourself from others. For example, allowing people to rent your products instead of buying them, that offers extra income! I really think that is a win, win, win model”.* Another participant also mentions that the concept of the CE allows businesses to be on top of their competitors. The demand for circular products, services, and business models is likely to increase in the future and thus it pays off to invest in knowledge and expertise on the topic now (P5). For other participants, the inclusiveness of circular principles in their business model has already proven to be successful in terms of market opportunities. One participant illustrates this by saying *“We started in the middle of the economic crisis but if you can make it in those days, you will definitely be able to survive after the crisis. We currently have eleven employees and have so much work that we can almost not handle it at the moment. So yes, I think that shows that the market is ready, it’s the right time” (P11).* Another motivation of including CE principles in a business was mentioned by P9 who states *“Circularity is something that, as a business, can be aspired based on*



*personal motivation or on the fact that a circular business model is the most beneficial. For us, I think the second option is applicable. However, circularity should definitely be something that you aspire, in my opinion*". For this person, the motivation for including CE principles in the business model is predominantly a result of a generous profit that can be earned because of using such a model.

The findings show that the majority of the participants did see the CE as a market opportunity that offered chances for their business. The increased attention for the topic in both governmental organizations and society shows the need for businesses that produce circular products. Participants indicated that the CE was an inevitable development that should be anticipated for by businesses in order to be economically viable in the future. This vision was shared by P16 and P17 who saw the CE as a way to differentiate yourself as an entrepreneur and take over a share of the market as well as an essential development in order to exist as a business in the future.

#### 4.3.5. Financial motive

Most of the participants did not mention a financial motive as a reason for including CE principles in their business model. All participants emphasized the need for realising a certain level of profit as essential for any type of business, also a circular business (P5). A sufficient sales volume is defined as the most important aspect by all entrepreneurs despite the desire to be circular. A participant illustrates this by saying *"Also within the circular economy, businesses need to earn a profit. Otherwise, such a circular system won't be financially possible"* (P7). Another participant states *"If you don't make a profit, you are not a business but an institution or something. If things are not going that great, economically speaking, your business will go bankrupt. I don't think that is circular"* (P9).

Despite the acknowledged importance of earning a profit by all participants, only some of them considered a financial motive as the main motivation for including CE principles in their business model. For one participant, the upcycling of resources was seen as a method to be circular and to earn money and illustrates this by saying *"If you can reuse a resource on the same level, you won't waste anything. However, if you can upcycle those resources into new products with more value, well, you will earn money with your eyes closed!"* (P8). Another participant motivates the choice for a CBM by saying *"The materials that are used in buildings, there are worth money! [...] At the end-of-life, when you don't need the building anymore, those resources will be worth money"* (P2). Finally, another participant states that their motivation of using a CBM is partly based on the reason they can earn more money by doing so. The person uses a business model in which clients can rent their products rather than buying them and says *"such a business model in which people can rent your products leads to higher revenues. For us, that is a really good model. [...] our business goal is to create value in multiple areas but we still want to earn money"* (P3).

Only for one respondent, the use of a CBM is fully motivated by the financial effect of using that model (P9). The person illustrates this by saying *"We have always thought about our final product. You need to make a product that you can sell, that earns you money, and that has added value for the person that buys your product. Otherwise, there is no point, nobody will buy it. Based on that vision we have developed our techniques and product"* (P9). The person states that their main motivation for using a CBM lies in the fact it brings them the highest yield. That such a model can be considered circular is less important for that person.

In short, the findings show that entrepreneurs can generate (a higher) profit money by using a CBM. A small change in the production process of the firm itself makes it possible to turn waste materials into valuable resources that could be traded with other firms. In other words, a small investment in the product or process could ultimately lead to a higher profit due to the ability to trade those resources.

#### 4.3.6. Intrinsic motivation

Most participants mentioned their intrinsic motivation as an important motivation for including CE principles in a business model. For one participant, the current situation in the construction sector was no longer acceptable. The person states *“the current way of construction, I almost think you could see that as an environmental crime. Resources are treated and used in such a crap way. I can no longer stand behind that. I just didn’t want that anymore. I couldn’t anymore. And I knew it could be different, so that’s what I did”* (P8). Correspondingly, another participant also emphasized the reluctance against current practices as an important motivation for transitioning to a CBM and illustrates this by saying *“I have always worked in IT but a couple of years ago I was thinking, is this really what I want? Businesses were getting bigger and bigger, everything was focused on those IT systems and no longer about the people behind the organisation. Everything was focused on money and not people. [...] I didn’t want that anymore. I didn’t motivate me anymore. That’s when I started my own business in which I motivate others to do what they want”* (P12). Another participant mentioned *“I was already longer focused on being sustainable and living a healthy life, I focused on my diet, I rode a bike instead of using the car, I didn’t use the plane that often, those kinds of things. [...] I also wanted to apply those things in my work. A lot of companies talk about doing it (being circular) but in practice the effect remains minimal. I wanted to do it (being circular) in the real world”* (P10). More participants mentioned the absence of practical examples that work on the topic of the CE served as a motivation to start their own business. P13 illustrates this by saying *“I have always been focused on sustainability and thinking in systems, so not so much focusing on only your own business or product, but the entire product chain. When I was at university I was already frustrated with the fact that everything was focused on the traditional economic model. I was frustrated with the fact there was no attention for the sustainable economy, why are there no examples of that? So after university, I thought, well, then I will go and do it myself”*. In conclusion, 14 out of the 15 participants indicated the intrinsic motivation as an important reason for including CE principles in their business model. Participants emphasize it is nearly impossible for one firm to change the system and argue they want to contribute to the CE by designing their business in such a way that it addresses one or multiple of those environmental and/or social issues. This is in correspondence with P16 and P17 who also indicated that the intrinsic motivation to contribute to a better world is an important motivation for entrepreneurs to include CE principles in a business model.

##### 4.3.6.1. The purpose economy

Some participants referred to the purpose economy as a concept that motivated them to transition towards a CBM. For those participants, the purpose economy was seen as one step further than the CE. One person illustrates this by saying *“The purpose economy is even more focused on ‘doing good’, on ethics maybe. Circular entrepreneurs do what they do because it is better for the environment and for the people. The will to do good for people, plants, and animals is even stronger in the purpose economy”* (P12). Another participant mentions *“I think, and that is what you see in the donut economy and the purpose economy, it is about not destroying the earth and that everybody gets an equal share. It isn’t about getting the highest profit. The social aspect is very important”* (P13). The combination of generating a positive effect on people, planet, and profit is also mentioned by P3 who states *“We don’t*



*longer want to just earn money. We would like to generate a positive impact in multiple areas. We want to earn money. We want to leave a positive ecological footprint, and we want to help people with a distance to the labour market to get a job again”.*

None of the participants could give a clear answer to what the purpose economy actually entails and how it differs from the CE. P16 argued that the main difference lies in prioritizing the social aspect. The person states that the purpose economy is more focused on the social aspect whereas the CE is more oriented on the ecological aspect. P17 disagrees to this and states *“the CE is about everything. It is about having a business, it’s about the ecological aspect, it’s about using renewable energy but it is also about the social aspect. What you do as a business and how that affects the society and the lives of people”*. It seems that the discussion on how the purpose economy differentiates from the CE is mainly a discussion on how these two concepts are defined.

#### 4.3.7. Fun motive

Finally, some participants mentioned a ‘fun motive’ as part of their motivation to transition towards a CBM. One participant stressed that finding circular alternatives for everyday practices should be considered as a fun way to find innovative solutions (P8). Another participant also mentioned that finding alternatives for current resources and/or practices can be challenging but also rewarding and illustrates this by giving an example *“Paint is always packaged in plastic bottles and in the end I had to throw those bottles away. I thought that was awful! All those plastic bottles ending up in the garbage. I started thinking, I wanted something without waste. The only thing I could find was paint based on chalk. Then I started thinking, o god, all those people have to blend their own paint before they can start and oh how will that be. But it turned out to be a success! People can blend their own colour of paint, how cool is that?! People really like that they can do this [...] But it required a shift in thinking. First, I thought o god, problem.. but it turned out that people actually like it. And I do not longer have to throw those bottles away”* (P13). This quote shows that finding an alternative for products can be challenging but can actually have a positive effect in the end. Another participant argues that the more circular they aspire to be, the more they are challenged to find innovative, alternative ways for everyday practices and that they see this challenge as fun and interesting (P15). A similar vision was shared by P16 states that entrepreneurs are interested in finding ways to find solutions to those issues while at the same time have their own business and be their own boss.

The findings show that only a few participants mentioned the fun motive as a direct motivation for them to transition towards a CBM. The fun motive was mainly mentioned as a way to find alternatives or solutions to the experienced challenges and barriers in the transition process to a CBM. The process of finding alternatives and solutions offered an option to ‘think outside of the box’ which was seen as a positive and fun development.

In general, this paragraph has shown an extensive overview of all the motives mentioned by the participants for including CE principles within their business model. The motivations that were most prominent were the intrinsic -, the market opportunity -, the social -, and the ecological motive. Interesting is that government restrictions as motive were not mentioned by many participants. This seems to fit with the entrepreneurial characteristics of developing new, innovative products and/or processes (upfront) rather than complying to governmental regulations (afterwards).

#### 4.4. Barriers experienced during the implementation of CE principles

To explore the barriers experienced by entrepreneurs during the implementation of CE principles in their business model, the following paragraph will examine the data in order to answer the fourth sub-question: *To what extent do barriers and/or enablers have an effect on the transitioning process to a circular business model?* Figure 10 presents an overview of the percentage of participants experiencing any of the five barriers that were expected based on the theoretical framework.

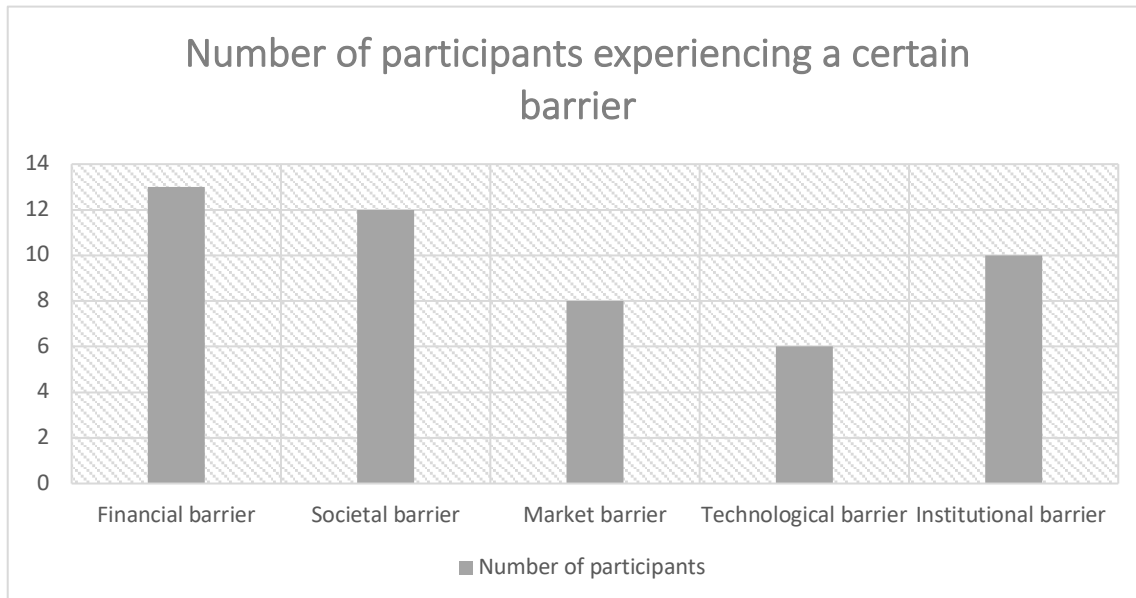


Figure 10: Number of the participants experiencing a certain barrier while/for including CE principles in their business model

Additional barriers raised by the participants during the interviews were added to the code book to provide a complete overview of all experienced barriers. However, these were often mentioned by only one or two participants and therefore not included in figure 10. A further elaboration on all experienced barriers (based on both inductive and deductive reasoning) by the participants is given in the following subparagraphs.

##### 4.4.1. Technological barrier

Based on previous academic studies, it was expected that the technological aspect served as a significant barrier for entrepreneurs to include CE principles in their business model. However, the data does not indicate technology as the most important barrier. In fact, technology was in many cases seen as an enabler that would have a positive effect on the pace and the transition towards a CE (P1, P8, P13, P14). For the far majority of the participants, the sky is the limit in terms of technology. Technological progress is by most participants seen as an opportunity to be more circular as well as an essential way to develop new products and/or services that can be brought to the market (P5).

Nevertheless, some participants did mention some technical issues as a hindering factor in their ability to transition to a (different type of) CBM. One person illustrates this by giving an example within their economic sector *“Within the plastic industry there are definitely things that can be improved. Some plastics are made out of so many materials, if you want to recycle that, that will give you problems. That’s where we see technology really needs to be developed in a better way.”* (P15). Another person

emphasized that they have not yet developed methods and/or options to reuse all of their residuals. However, the person also stresses that innovations are needed to further optimize those opportunities and has confidence this will happen in the coming years (P10).

In conclusion, participants recognized technological development as an important factor for the transition to a CE. In many cases, participants emphasized that not all aspects of their business model could be circular yet because there are innovations needed to reduce, reuse or recycle certain resources. However, all participants mentioned they saw the technological aspect as an enabling rather than a constraining factor in the transition to a CE.

#### 4.4.2. Financial barrier

Another noteworthy barrier indicated by previous researches is the financial barrier. This type of barrier was mentioned the most by participants as a factor hindering the (further) implementation of CE principles in their business model. Around 86% of the participants described a certain type of financial barrier. The word cloud in figure 11 gives a small insight into the various financial barriers experienced by participants.



Figure 11: Word cloud based on the types of financial barriers that were mentioned by the participants

Figure 11 indicates that the current financial system is considered a hindering factor by multiple participants. One participant mentioned they were interested in developing a lease model for their products which would be in line with a specific type of CBM. However, financial institutions did not provide them with a loan to facilitate this development since the risks were considered too large for a business their size (P4). P16 and P17 also mentioned the unavailability of financial products offered by large financial institutions for circular entrepreneurs as an important barrier. Other participants emphasized the high (upfront) costs associated with developing circular products and/or recycling all their used resources. One participant illustrates this by giving an example *“It is the combination of what your budget is and what is available. Which financial means do I have to solve a problem? It could be that someone who only has X amount of money to solve Y tries to do that in the most sustainable way possible but another person who has X+10 to solve Y will always say that the other person did not really solve the problem in the most sustainable way”* (P14). This vision was also shared by P16 who says *“some firms rather not say they are including CE principles. They think they are doing a good job because they have gone from zero to three steps for example. Firms who already have done 5 steps will say ‘only three? That’s not good’ and in that case it will be almost a negative thing”*. For some firms, it

is too costly to work on CE principles in all aspects of their business. Especially those firms that have to transition their LBM to a CBM cannot make this transition overnight due to the financial consequences of reorganising a business model. Furthermore, all participants stressed the importance of earning a sufficient amount of money and profit making as essential components of entrepreneurial activity. Without a certain amount of profit, there is no business that can survive. The amount of profit that entrepreneurs perceive as sufficient did vary greatly among the participants. Another financial barrier that was often raised by the participants were the logistic costs associated with the transport of (used) resources for recycling. One participant stated that the transport costs for recycling certain resources have to be combined with the delivery of their product in order to make it economically viable (P11).

In conclusion, the participants identified the financial barriers as the most dominant factor hindering the (further) inclusion of CE principles in their business model. Participants stated that there are currently many opportunities to recycle certain products (since there are hardly any technological barriers indicated as a limitation for the recycling of resources) but that the costs associated with developing the necessary techniques were the most dominant constraining factor. In general, the financial barriers as presented in figure 11 and their interconnectedness can be identified as general barriers in the transition to a CE and thus do not only apply to entrepreneurs willing to implement (more) CE principles in their business model. Participants acknowledged that a *“reasonable price”* is not only an important factor for them when buying the necessary inputs for their production process but also for their clients when they buy the products produced by the entrepreneur. Therefore, the financial barrier of one entrepreneur seems to affect the wider product chain in which the individual operates and thus the ability of other entrepreneurs to act upon CE principles. Based on these findings, it can be argued that the financial barrier has an effect on both the inclusion of CE principles at the firm level as well as the general transition to a CE.

#### 4.4.3. Market barrier

The third type of barrier hindering the implementation of CE principles in a business model that was mentioned by participants related to market conditions. This could also be derived from figure 11 in which ‘not enough demand’ was among the most prominent financial barriers experienced by participants. The notion of insufficient demand for circular products from the market was seen as an important barrier by around half of the participants. One participant illustrates this by saying *“If you want to grow faster than the market allows, well, that’s a problem. You can’t do more than what the market asks”* (P5). Another participant illustrates the lack of market demand by saying the following: *“What do most clients mean with circular? Most clients ask for ‘repair’ business models, so instead of buying a new product they want the old product to be repaired. But if you want to be circular, it needs to be more than that. [...] For our share of the market, I haven’t seen any inquiry for such a product. Nothing. The market is really struggling”* (P2). Participants mentioned that despite an increase in interest for concepts such as sustainability and the CE, most people and/or businesses do not act upon these interests in their actions which results in a lack of market demand that incentivises entrepreneurs to transition to a CBM (P5, P4).

The findings above are to a great extent related to the findings presented in the previous paragraph. The financial and market barrier are very closely related and serve as a major factor impeding the transition to a CE. Many participants indicated they are constrained by what the market demands and without market demand, there is no chance to be circular and economically viable at the same time.

#### 4.4.4. Organisational barrier

Most participants mentioned difficulties in organising their business in such a way to meet the objectives of the CE. One participant mentioned that their product suits the objectives of a CE since all resources could easily be recycled and reused in their or other products. However, the person also indicated that in practice they do not have the organisational procedures in place that facilitates this process of 'cradle-to-cradle' (P4). Another participant emphasized that the organisational structure of the sector hindered the transition from a LBM to a CBM. The person illustrates this by saying *"The current process in the construction sector means that a contractor gets the job, but only because he can offer the lowest price. That person is also outsourcing some parts of the process to others. The whole issue of the budget, the low budget that the contractor offered in order to get the job, has an effect on all of the other contractors who are hired later on. You can imagine that if you have the ambition to develop a circular product in the construction sector, this won't work in this current system in which price is the most important factor"* (P2).

Another organisational barrier impeding the ability of entrepreneurs to transition to a CBM lies in the fact that every business is depending on suppliers. The extent to which those suppliers are circular largely affects the ability of an entrepreneur to act upon CE principles and this was mentioned by various participants as a hindering factor. One participant illustrates this by saying *"Everybody thinks it (the CE) is a nice concept or thinks your product or innovation is good, but to really find people that dare to invest in your product... well, that's a lot more difficult. Everybody is like: oh if they invest I will invest as well. But that doesn't work because if everybody says that, nothing happens"* (P13). Without suppliers and/or clients who are willing to invest in a circular product, it is impossible to transition to a fully circular economy, especially since in the current economic system circular products are in many cases more expensive (P1). Finally, another participant stated *"Part of the circular economy, and often times that is not mentioned that well, but part of it is to really collaborate. But I mean really work together. You have to understand one's other interests. And you need to be willing to do concessions if that means there is a positive effect for the entire product chain, instead of only your own firm"* (P15). Participants indicated there are still major steps that need to be taken in order to transition to a CE. However, they also emphasized that it is essential to have the ambition to be circular and to surround yourself as an entrepreneur with firms/suppliers who have the same ambition (P2).

In conclusion, participants emphasized the different organisational structure of a circular business compared to a linear business. Especially the participants that transitioned from a LBM to a CBM mentioned this as an important barrier. Both participants that transitioned to a CBM as those who directly started with a CBM indicated that finding suitable partners to collaborate with was difficult. All firms are dependent on suppliers for their resources and the extent to which they are willing to work on the CE influences the ability of one entrepreneur to act upon the CE principles.

#### 4.4.5. Institutional context

The institutional context was identified as one of the most important barriers impeding the transition to a CE by the participants. Firstly, participants mentioned that the procedure to apply for subsidies is rather difficult and time-consuming. Many participants mentioned that it should not be desired to constantly receive subsidies in order to be able to operate but that subsidies can facilitate the set-up phase of a circular business (P11). The start-up phase of a business requires huge investments while entrepreneurs do not yet have the ability to earn money (P9). Another participant emphasized that

there are currently options for entrepreneurs to be financially supported but that it is extremely difficult to receive those funds due to the difficult and time-consuming procedure to apply for that financial support (P13). This participant also states that the government could facilitate the transition to a CE by using their financial means to support entrepreneurs who act according to (one of) the CE principles. Correspondingly, another participant states *“If you as a government want to stimulate the transition to a circular economy you need to spend your money on those entrepreneurs who actually work on that transition”* (P10). Especially this point of tendering and procurement as key aspects in the transition to a CE was mentioned by multiple participants. The organization of P17 aims to help governments to include CE principles in the way they write their tenders to change this.

In the second place, participants mentioned current legislation, rules, and procedures as one of the most prominent barriers for entrepreneurs who want to have a CBM. In order to achieve a CE, it is essential to have product- and process innovations that allow the recycling/reuse of resources in the same or different production processes. However, the participant states that the institutional context makes these kinds of essential innovations rather difficult and illustrates this by saying *“We have once experienced that somebody said: if there are no rules it is not allowed. That is outrageous! You ask something, somebody looks in this book and then says, sorry sir, there is no legislation so what you want to do is not allowed”* (P1). Another participant gives a practical example in which legislation has made it impossible to meet the objectives of a CE: *“For example, a firm has to become more sustainable. Legislation requires they do that within their own chain. So they are building a digester that can only use cattle manure. But that is the most stupid idea ever. Economically infeasible, just not possible. Why do they still do it? They have to, they cannot use pig manure because that is not within their own chain. And legislation requires that you do it (become circular/more sustainable) within the own chain. It’s ridiculous”* (P5). Another participant notices that rules and regulations will always be seen as a hindering factor because they are based on old practices. Nevertheless, the participant emphasizes it is essential that the government recognizes this and is willing to change rules and regulations in order to facilitate entrepreneurs who want to move forward (P10). The same opinion was shared by P17 who argued that the institutional context should offer room for experimentation by saying *“the transition to a CE is a process of trial and error. At the moment, there is no room for such a thing. Laws and regulations make it very difficult to do things ‘different than usual’. That is definitely something that has to change in order to accelerate the transition”*.

In conclusion, the institutional context was identified as the most important barrier by most participants (13 out of 15). Despite the fact there are several funds where entrepreneurs can apply for financial support, the participants indicated that the procedure to apply for those funds is rather complex and time-consuming. Subsidies were especially seen as a necessary factor for the set-up phase of a circular business to meet the investments costs associated with developing a CBM. Legislation and regulation were mentioned as the other main institutional barrier for entrepreneurs who want to include CE principles in their business model. Participants indicated it is essential that the government is willing to make changes to these rules and regulation in order to facilitate the entrepreneurs who work on the transition to a CE, especially since the government has set the ambition for a CE in 2050.

#### 4.4.6. Societal context

Finally, the societal context was mentioned as a barrier for the transition to a CE by the participants. The far majority of the participants indicated that consumer awareness has to be improved in order to

transition to a CE (P8). However, P11 and P15 argue that it is extremely difficult to change human behaviour. Therefore, entrepreneurs face the challenge of producing circular products within a society that demands the same quality and/or quantity of products as produced under linear circumstances (P7). At the moment, the demand from society for circular produced goods remains minimal and thus can be seen as a restriction for entrepreneurs to develop circular products/services (also see the discussion on the lack of market demand in paragraph 4.4.3). Without societal demand for circular products, there will be no incentive for entrepreneurs to work on developing a CBM since it will not be economically infeasible to produce according to CE principles (P14). However, without entrepreneurial incentives and innovations, there will be no alternatives for people who are inspired to change their behaviour. Therefore, there is a need to stimulate both societal and entrepreneurial actions by, on the one hand, facilitating actors to act according to CE principles and on the other hand limit those actions that are not in line with CE objectives. This is also illustrated by another participant who stated *“The other day I made lasagne and I was shocked by the amount of plastic waste I had. But as a consumer, I can’t influence the product chain of all those ingredients in my lasagne. If I decide now, right here, I don’t want to use any plastics anymore, where will I get my food? As a consumer, I can’t influence that”* (P6). Nevertheless, later on, the participant recognized that an increased demand from consumers would serve as an incentive for businesses to change their business practices and thus shows the interconnectedness between societal and entrepreneurial actions.

Participants indicated several perspectives on how to change the societal context. Firstly, creating consumer awareness was seen as an essential component in order to increase the demand for circular products (P14). To increase this demand, P1 argues that people should actually see and understand the effects of their actions and the LE in general on the global environment. In the second place, participants indicated the necessity of collaborating with educational institutions in order to inform and inspire young people. By integrating sustainability and circularity in educational purposes, young people will become more aware of the effects of non-circularity, both in environmental and social terms (P12, P17). Participants also indicated they would like to collaborate with students from universities to further develop their business.

The findings in this paragraph present that the societal context is an important factor impeding the transition to a CE and partly relates to the market barrier (as discussed earlier). Participants indicated it is essential to increase consumer awareness on the effects of non-circular businesses and products to increase the demand for circular products. Participants indicated it is nearly impossible to change entrepreneurial actions to CE principles without the societal demand for their products. However, P16 and P17 argue that it seems societal awareness is increasing and the demand for circular products and businesses is slowly increasing.

In general, the findings presented in this paragraph have shown that the institutional-, market-, financial- and societal context were among the most prominent factors impeding the transition to a CE. Interestingly, the technological barrier was not seen as a very constraining factor by many participants. In fact, participants saw the technological aspect as an opportunity for developing innovation that further enhance the transition to a CE. Finally, the organisational barrier was mentioned by some participants as an additional constraining factor. Especially finding the right partners to collaborate with was mentioned as an important factor limiting the (further) implementation of certain CE principles.



#### 4.5 The effect of geography on the transition to a circular economy

This paragraph presents the findings that relate to the role of geography in the transition to a CE. The data presented in the following subparagraphs are used to answer the fifth and final sub-question of this research: *“To what extent does geography affect the ability of entrepreneurs to include CE principles in (certain aspects of) their business models, and how can geographical distance play a role in the transition to a circular economy?”*.

Based on the literature study in chapter 2, it can be assumed that the geographical proximity of partners contributes to better opportunities to develop a fully circular business. A shorter distance between firms facilitates the exchange of resources and knowledge that contribute to a closed system in which resources are constantly reused by multiple actors. During the interviews, participants were asked to what extent the nearness of partners was essential for their CBM. Furthermore, the participants were asked at what level their business actively works on the principles of the CE (within the own firm, together with firms in a specific location, or in both production and consumption aspects of the firm). The given answers to those question form the foundation for the findings presented in this paragraph.

##### 4.5.1. The geographical level at which the firm operates

In paragraph 2.7, three types of system levels through which a firm can operate in a circular way were discussed: the micro-, meso-, and macro level. The micro level refers to the individual firm and thus relates to what extent CE principles are integrated within the own firm. The meso level refers to the inter-firm level in which firms are located in the same geographical area which enhances the ability to capitalise on trading by-products of production processes. Finally, the macro level refers to firms that produce their goods in circular networks (meso-level) as well as aim to promote consumer awareness. Figure 12 provides a classification of the businesses of the participants across these different levels.

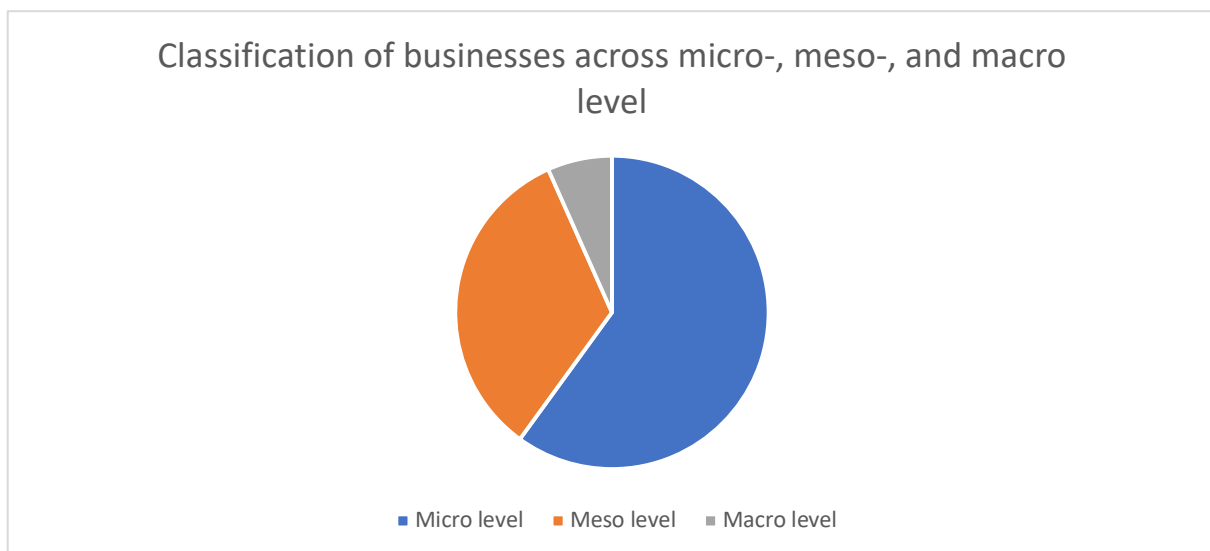


Figure 12: Overview of the classification of businesses across the three different levels: micro, meso and macro level

As figure 12 indicates, the majority of the participants seem to operate their CBM at the micro level. This would suggest the majority of the participants predominantly focuses on including CE principles within the individual firm. Some remarks regarding this classification can be made. First of all, the



classification of firms across these three levels makes it difficult to classify those firms that act on CE principles within a wider geographical area. This is a result of the definition of the three levels which are either focused on the individual firm level itself or on the close proximity and collaboration of/with other firms. This classification does not allow to ascribe firms that work together with other businesses that are located further away to any of the three levels. It could be that a firm classified as a micro-level firm does work together intensively with a firm in another country in terms of the CE. For this thesis, the micro level is defined as the category that contains both firms only focusing on CE principles within the individual firm as well as firms that do not actively work together with others within a specific geographical area in order to have a CBM. For those firms, the geographical location of the firm is not directly associated with the type of CBM they use.

For one participant, the focus on being a circular firm is predominantly centred around the individual firm itself and motivates this by saying *"I believe every firm has a specific role within the chain. I am not interested what you can do after we have recycled plastics. That is not my role in the chain. Personally, yes I am interested in that but for the firm, there is no interest"* (P6). Another participant mentioned that their business product was entirely developed by the person itself without any involvement of other parties (P1). Therefore, this entrepreneur can be ascribed to the micro level since the development of the product did not require collaboration with actors within a specific geographical area. This vision was shared by P2 but added that the extent to which a product can be considered circular depends on suppliers that also work on including CE principles in their production process.

As can be seen in figure 12, the second largest group of participants can be assigned to operating at the meso level, and thus closely collaborate with partners located within close proximity of their own firm. An example of this is given by P15 who stated that another firm was interested in recycling their resources into new products. The business of P15 has agreed to this collaboration on the prerequisite that the firm would locate on the same business park. The close proximity of the two companies would facilitate knowledge sharing and process/product optimization as well as contribute to the desire to develop a state of the art centre for recycling and upcycling resources. A similar example of a firm that operates within a network of local partners is the business of P10. The resources they need to develop their products are retrieved from local partners. The person does emphasize that the perception of what is considered local can differ greatly between people. For that person, the local scale is defined as those areas/partners reachable by bike. The required resources for their products, as well as the final product itself, are all obtained and distributed within the geographical range that can be reached by bike. Another example of a business that operates at the meso level is given by P5 who sells their produced heat to local businesses that use that as sustainable energy. The proximity of the other business facilitates the ability of the firm to close resources cycles and transition to a (more) CBM.

Only one participant is considered to operate at the macro level since it is the only firm that actively works on promoting consumer awareness regarding the CE. P13 illustrates this by saying *"the goal is to promote awareness. That people become aware of what is possible and that they can turn that into action. So, that they become inspired by what they see and then, later on, have the ability to act upon that through their own actions. By submerging them in what is possible I hope that they start creating themselves, also in their daily lives"*. Besides promoting consumer awareness, the participant is actively working on collaborating with partners to develop a circular network of managing resources.

#### 4.5.2. Nearness of partners

The level at which the firm operates on CE principles, as discussed in the previous paragraph, also influences the importance of the proximity of partners. For those firms who do not actively work together with local partners to develop their circular business product, it is not essential to be located together in space. P1 illustrates this by saying *“Sometimes it is useful to see each other, but that could also be through Skype or email. I don’t think that matters [...] Sometimes it is useful to really get somewhere if you are still developing an idea or product but, no, other than that there is no need”*. For other participants, the ones operating at the meso level, the nearness of partners was indicated as far more important. P5 exemplifies this by saying *“It is useful to be closely located to each other so you don’t have to transport the resources over long distances [...] But also with heat. You cannot make electricity without producing heat. It does not make any sense to produce electricity in a certain place if you cannot deposit your produced heat in a sustainable way [...] But that means you have to be close to each other. I won’t be able to sell my produced heat to a firm located 80 kilometres away. By the time it gets there, it will be cold”*. It seems that the importance of partners located nearby is mainly a consequence of the exchange of specific resources. For example, in the case of heat transportation, it is essential to be located near each other in space (P17).

In conclusion, for the majority of the participants, the nearness of partners was not indicated as an elementary matter for the transition to a CE. Colocation of businesses was only seen as essential for the exchange of resources that cannot be transported over long distances. Whichever the firm was predominantly operating at the micro, meso or macro level, for all participants the ability to find suitable partners was indicated as far more important. As P6 described: *“In order to produce in a circular way, you need to make connections with suppliers who also want to put the circular economy at the core of their business and thus accept the consequences of that decision”*. The same argument was given by P16 and P17 who says it is more important to find the right partners that share the same vision than finding local partners. However, P16 does mention it is often more likely to meet new partners at the local and/or regional level than further away but also emphasizes this depends on the size and the sector of the firm.

#### 4.5.3. Northern Netherlands as a leader in the transition to a CE

Participants were asked to what extent they saw a role for the Northern Netherlands as a leading entity in the transition to a CE in the Netherlands. The Northern Netherlands served as the case study area for this research and has expressed the ambition to become the ‘greenest region’ in the Netherlands by acting as a frontrunner in the national transition. Important economic sectors in the Northern Netherlands that offer opportunities for developing a CE are agriculture, construction, waste management, and the chemical industry. The movement of circular entrepreneurship is growing in this region and more initiatives arise in other sectors as well (SNN, 2018).

Participants acknowledged that the outspoken ambition of the Northern Netherlands stimulates circular entrepreneurship in the region and that movement and awareness concerning the CE is growing in the region, contributing to a denser network of circular businesses. The establishment of organizations that represent the interest of circular entrepreneurs was seen as an important factor in facilitating the development of these networks. As such, P15 said *“We have set up this association and many firms have joined that. Those firms operate in very different economic sectors but all those firms have the same attitude and vision”*. Another participant (P17) argues that the Northern Netherlands

should not be seen as one entity that is the region at which the transition to a CE should be aspired. The person argues that each region should concentrate on its own core business sectors and stimulate initiatives in those sectors. This vision is motivated by the fact that the willingness to transition to a CE should come from the business environment. Without the commitment of the entrepreneurs, it is not possible to develop CE initiatives. Therefore, each region should focus on its own dominant economic sectors in which the most benefit can be achieved.

For the majority of the participants, the Northern Netherlands is not seen as the only region that exclusively focuses on the CE and stimulates entrepreneurs to actively work on contributing to a CE. The motivation and willingness to contribute to a national CE can be found in multiple regions and cannot solely be ascribed to the Northern Netherlands (P12). Similarly, another participant emphasized that the regional component in developing a CE is very important in terms of closing resource cycles and collaboration with other businesses but is not necessarily an aspect that can be solely ascribed to the Northern Netherlands (P3). For some participants, the location choice of their business in the Northern Netherlands was motivated by the fact the person wanted to contribute to the local economy and regional transition to a CE, which is illustrated by P13 who says *“After I graduated, I could have moved to Amsterdam and work for a green, sustainable company. But, the Northern Netherlands has so much potential and it also needs to happen here so I am not leaving. I want to make it happen here. You can say I am very explicit about that”*.

Another participant questioned the role of the region in the transition to a CE and illustrates this by saying *“Back in the days, like 200 years ago, basically everything was produced in a circular way. Everything was produced and consumed within the region. However, today, many resource flows are traded on the national or even international market. Things won’t go back to how they were so we have to look at how to make a circular global economy”* (P6). The fact that businesses today trade and operate on a much larger scale than hundreds of years ago requires a broader perspective on the transition to a CE that goes beyond regional borders. Participants did not indicate any reason for assuming that the Northern Netherlands serves as the exclusive region in which the transition to a CE takes place.

Participants mainly described the role of the Northern Netherlands as the geographical entity that facilitates collaboration and connections between firms in the region. Many participants mentioned they found it difficult to find other businesses with the same motivation and attitude towards the CE. One participant mentioned that a regional platform where entrepreneurs can meet others to exchange knowledge and resources will stimulate the transition to a CE and illustrates this by saying *“The whole issue of visibility, we need to know what others are doing. Some sort of platform, I believe others are working on developing that. But just something where I could post: I have this resource that I don’t use anymore and that somebody else can say: yes, I can use that to make my products. That’s how we make a closed system”* (P13). Correspondingly, another participant stated *“It is essential to make connections. [...] If you talk about making connections, it is often the case you constantly meet the same people who are already working on the CE. It is also important to reach out to those entrepreneurs who have never heard of the circular economy.”* (P10). To the question what the Northern Netherlands should do to facilitate and/or accelerate the transition to a CE a participant argued *“It is about promoting those products that have a demonstrable amount of recycled resources in them. Furthermore, it just needs to be done. Not just organizing, writing policy etcetera. Search for others,*

*search for collaboration. Transparency, that is important” (P15). P16 argues their organisation is currently working on developing such a platform where entrepreneurs can meet each other. In addition to this, their organisation wants to become the entity that represents the interests of circular entrepreneurs. The person gives an example of this by saying “We want to represent the interests of entrepreneurs so we can actually make a difference [...]. If you as a single entrepreneur go to the local government they will not immediately change things because you are just one entrepreneur who has a certain interest in that matter. However, if we can go on behalf of an entire group of entrepreneurs, we will have much more power to actually change things” (P16). P17 argues their organization already consists of a large network of 80 entrepreneurs who have agreed to work on the CE. The person argues that such a network is essential in the transition to a CE to foster the visibility of the business and their products as well as facilitate the exchange of knowledge and resources.*

In conclusion, the participants did not assign an exclusive role to the Northern Netherlands in terms of the only region that could facilitate the transition to a CE. However, the region was seen as a suitable space in which entrepreneurs could work together and be stimulated by governmental funds and regional institutions. Therefore, the Northern Netherlands should be seen as the region that facilitates the transition to a CE rather than a strict demarcated area in which the CE has to be located. Some participants indicated they would like some sort of regional/national platform at which they can meet other circular entrepreneurs and possibly find new connections to exchange knowledge, ideas, and resources with. The region could facilitate the demand for such a platform by setting up an organisation that brings together circular entrepreneurs, governmental institutions and knowledge institutions.

## Chapter 5: Discussion

This chapter presents the discussion in which the empirical findings as presented in chapter 4 are linked to the existing literature and framed within the broader concepts discussed in the theoretical framework to address each of the sub-questions and expectations as stated in chapter 1 and 2. Any unexpected findings that were evident in the data collected will be discussed and their meaning in relation to the research problem is explained. Furthermore, this chapter will discuss insights that could contribute to the academic literature on circular entrepreneurship as well as serve as input for future policies on this topic.

### 5.1. Defining the circular economy

This paragraph discusses how the participants demarcated the concept of the CE. This helps to place the empirical findings within the wider context and the existing literature on the CE. Participants indicated two major key themes as the fundamentals of the CE. In the first place, the participants indicated that the concept of the CE directly implicates a closed system in which resources perpetually circulate and thus reduces the demand for raw resources. This is similar to Schandl et al. (2016) who also defined the CE as the approach that decouples economic growth from ever-increasing resource demand. In the second place, participants emphasized the importance of system-thinking as a crucial principle of the CE which is in line with Ghisellini et al. (2016), Jawahir & Bradley (2016), and van Renswoude et al. (2015). In order to facilitate this, participants drew attention to the fact that this should already be considered at the beginning of the production process (Lewandowski, 2016). Participants indicated that relatively minor changes to their production processes would allow for a better ability to exchange resources with entrepreneurs operating in the same or different economic sector. Especially this recognition of cross-sectoral collaboration was identified as essential for a CE by the participants, which is in line with Raworth (2017) who argues that a network of circular businesses is needed to prevent countless individual systems that each implements CE principles on their own. In other words, participants acknowledged that without the ability to exchange resources between firms operating in different economic sectors it is impossible to create a CE.

The aforementioned shows that participants indicated similar CE principles as proposed by Lewandowski (2016), namely: design for reuse, think in systems, and waste is food (symbiosis). Not all participants explicitly mentioned the use of renewable energy sources as a key principle of the CE. This could possibly be a result of the fact that participants did not see that as an aspect that is inherently linked to the CE but more to the general concept of sustainability. However, the CE was often mentioned as the embodiment of sustainability and thus it could be argued that participants saw the use of renewable energy as an integral component of the CE. Furthermore, the pursuit of diversification by developing additional/new cash flows to establish a firm that is resilient from external shocks was not directly mentioned by the participants as a core principle of the CE but was more seen as a resultant effect from other principles, by for example, the integration of the design for reuse principle. Changes to the production process or product would allow for residuals to be traded instead of obliterated. Participants did mention this as a method to expand their entrepreneurial activity to new markets and, consequently, contribute to their financial assets rather than as a method to increase their resilience to external shocks (e.g. economic crisis). An explanation for this difference between the empirical findings and the literature could be that entrepreneurs always consider the

diversity of their firm as important and not only in times of external shocks. Participants emphasized they found continuity of the business important at all times, also in prosperous economic times. Having a long-term vision for the firm that anticipates on future events was indicated as an essential component for any entrepreneur by the participants, and thus not something that could be solely ascribed to a circular entrepreneur.

Finally, participants indicated similar main objectives of the CE as Ghisellini et al (2016): reduce, reuse, and recycle. Participants did not make a specific distinction between the reuse and recycle component whereas Ghisellini et al. (2016) do make this division (between reusing the entire product or reusing the product as a resource for another product). An explanation for this could be the fact that none of the participants did solely focus on trading products as a whole (such as second-hand clothing) and therefore did not make a distinction between the reuse and recycle component.

In general, the findings of this research indicated that the core principles of the CE can indeed be found in other schools of thought (e.g. blue economy, cradle to cradle etc.) but that the CE offers a holistic integration of all these principles in one model. A consequence of this holistic framework is that the principles are inherently linked to each other and it is hardly ever possible for entrepreneurs to solely act upon one CE principle. Therefore, it can be stated that the first expectation of this research (*“circular entrepreneurs aim to include the five core principles of a CE system: design for reuse, build resilience through diversity, rely on energy from renewable sources, think in system, and waste is food”*) can be confirmed based on the outcomes of this research. This information helps with the demarcation of the concept of the CE that may serve as input for future research.

## 5.2. What is the role of the entrepreneur in the transition to a CE?

As reflected in the data presented in chapter 4, participants assigned the entrepreneur a significant role in the transition to a CE. They all identified the transition to a CE as an inevitable development upon which entrepreneurs have to anticipate. In fact, participants indicated the entrepreneur an essential actor that facilitates this transition since they are the ones developing the products and services used in society. Participants assigned the entrepreneur the important task to develop new innovations that are in line with CE principles to bring about the transition to a CE (Schot & Kanger, 2016). The recognition of the entrepreneur as a vital component for the transition to a CE reflects the earlier findings of Raworth (2017) and Jesus & Mendonça (2018). The participants indicated the entrepreneur as the actor that introduces radical or incremental changes to products, services or production processes in the market (Galindo & Méndez-Picazo, 2013). This type of innovation is mainly oriented towards the technological aspect (Autio et al., 2014). Participants also drew attention to the organizational aspect of the business where change can occur which is also mentioned by Eroğlu & Piçak (2011) who emphasize that technical and organizational innovation are the main drivers of economic activity. The type of innovation (incremental, architectural, discontinuous) implemented by the participants largely depends on the context in which the entrepreneur and the firm are situated and a further elaboration on the influence of contextual factors is given later on in this chapter.

## 5.3. Who is considered to be a circular entrepreneur?

The findings have shown that participants defined circular entrepreneurs as individuals who are not solely profit-driven but have other aspirations such as contributing to a better environment and/or

including people with a distance to the labour market in their business. Environmental harm caused by pollution or the overexploitation of natural resources were often mentioned as market failures that offer opportunities for entrepreneurs to develop a new business (or change their existing business) to address these issues. Participants who pursued the aim of offering employment opportunities to people with a distance to the labour market mainly saw this as a logical, but additional, effect of their entrepreneurial activity. Therefore, it can be argued that most participants saw the social component as an integral part of circular entrepreneurship. Only some participants did indicate the social motive as dominant reason for defining an individual as a circular entrepreneur (e.g. one participant mentioned Tony Chocolonely as a circular entrepreneur which was founded to alter the inhumane treatment of people in the chocolate industry). The reasons for founding the businesses of the participants were mainly related to environmental-, rather than social, issues that exist because of market failures (Shepard & Patzelt, 2017). As reflected in the data, variation existed in the type of market failures upon which participants act but a consensus was reached over the fact that circular entrepreneurs have to act upon one (or multiple) of the CE principles.

Participants emphasized that the economic gains are in essence more important than the non-economic gains given that a business needs a certain level of profit in order to be economically viable in the long-term. Whereas Belz & Binder (2015) and Schaper (2016) state that entrepreneurs have to make a trade-off between the economic and non-economic gains, participants indicated that for circular entrepreneurs the economic gains are directly related to the non-economic gains and thus there is need to make a such a trade-off. An explanation for this could be that Belz & Binder (2015) and Schaper (2016) have based their insights on sustainable entrepreneurs rather than on circular entrepreneurs. Sustainable entrepreneurs are initially driven by economic gains but also deliver positive non-economic gains (Shepherd & Patzelt, 2017). A circular entrepreneur is inherently different since the aim of their business is not to sell products but to generate profit over the flow of materials and products over time (Bocken et al., 2016), and thus the non-economic gains are inherently linked to the economic gains. Both sustainable - and circular entrepreneurs strive for positive environmental and/or social impact but it seems they differ in the way they enforce this impact. An example of this is given by the participant who uses a CBM since it brings the highest profit rather than that the person is motivated by environmental and/or social issues. This person would not be classified as a sustainable entrepreneur. However, that person's business model includes multiple of the CE principles as well as delivers positive environmental impact and thus can be classified as a circular entrepreneur.

Furthermore, circular entrepreneurs have to change their LBM to a CBM or start their business with a CBM. This means they exploit market opportunities by creating new, or changing existing, institutions in a way to meet the objectives of a CE. Therefore, circular entrepreneurs can indeed be classified as institutional entrepreneurs (Bruton et al., 2010; Fischer & Pascucci, 2017; Shepherd & Patzelt, 2011).

In general, the findings of this research have confirmed the expectation that *"circular entrepreneurs are exploiting market opportunities that exist because of market failures while acting according to (one of) the principles of the CE"*. This information provides insights to further develop a formal definition of circular entrepreneurs which can be used in future research. Future research should acknowledge that not all individuals who strive for profit-maximization are automatically considered non-circular entrepreneurs. However, it could be that entrepreneurs who use a CBM for profit maximization have a more opportunistic attitude towards the CE and see the inclusion of CE principles solely as a tool to

differentiate themselves from competitors. Nevertheless, this was only applicable to one participant in this study and thus future research should examine whether or not this is a common practice.

#### 5.4. What types of circular business models are used by circular entrepreneurs?

In order to gain a better understanding of what a CBM entails, participants were asked to describe their business model. Based on that, it can be argued that the classification of Bocken et al. (2016) provides a thorough understanding of the various types of CBMs. Whereas Linder & Williander (2015) and Planing (2015) define a CBM as a model through which a firm utilizes economic value of those resources that remain unused or unnecessary after the production of the initial goods, participants argue that a CBM is a model through which a firm utilizes the economic value of integrating CE principles in any stage of the production process to create social, environmental, and/or economic value. This differs from the definition of Linder & Williander (2015) and Planing (2015) since they merely focus on the opportunities for integrating CE principles at the end of the production process, while participants emphasized that CE principles can be integrated at any stage of the production process. An example of this is the participant whose business model focused on optimizing parts of the production process (producing industrial techniques that prevent the rusting of machinery). That type of CBM is not so much concerned with utilizing the economic value of products that remain unused after production and would thus not be classified as a CBM by Linder & Williander (2015) and Planing (2015). However, based on the classification of Bocken et al. (2016) this particular example would be defined as a CBM. Based on the findings of this research a CBM should be defined as a business model through which a firm utilizes the economic value of integrating CE principles in any stage of the production process to create social, environmental, and/or economic value. The main difference here lies in the fact that capturing economic value in a CBM does not only come from using resources that initially remain unused after production but also focuses on generating economic value in other stages of the production process. The findings presented in this and the previous paragraph contribute to the existing literature by clarifying who can be classified as a circular entrepreneur. However, it should be noticed that this is an explorative case-study and further research is needed to confirm these findings.

#### 5.5. What are the most important motivations for including CE principles?

Participants recognised the opportunity to differentiate themselves from competitors by including CE principles in their business model. In line with Stecker (2016), participants mentioned the need for legislation that demands accountability and transparency as a safeguard to keep track of the production processes and material flows in order separate circular entrepreneurs from greenwashing firms. None of the participants mentioned (new) information technologies as a safeguard for this issue while this came forth as an important pillar in the researches by Bowen (2014) and Scott (2015). A reason for this could be that new technologies (such as blockchain technology) are considered an expensive solution while the monetary benefits are unknown. Participants indicated that, especially for SMEs, these upfront investment costs (for both the technology itself as well as for maintenance) are considered too substantial. Furthermore, participants acknowledged the market potential in 'being circular'. The upcycling, recycling and/or reuse of resources was seen as a way to generate a higher profit and/or enter new markets. This shows that for some of the participants the inclusion of CE principles is indeed seen as a way to capitalize on the increased interest for circularity, as proposed by Lenczuk (2017).



Four respondents indicated that government regulation has driven the transition to a CBM. However, two of those four worked in semi-governmental organizations that partly exist because of strict governmental legislation on recycling resources. Nevertheless, the findings show that for some entrepreneurs government regulation can serve as an incentive for including CE principles in the business model (Lewandowski, 2016; Lenczuk, 2017; Jackson, 2011, 2017). Participants described the government as the leading institution to implement more rules and regulations to foster the transition to a CE. This is different from the opinion of Senker (2011) and Kitanov (2011) who question the ability of the government to enforce such regulations. In contrast to Senker (2011), participants did not mention the dependency of the government on 'traditional' firms for the economy and/or employment levels. A reason for this could be that the participants saw the CE as an inevitable future development. Therefore, participants would indicate that circular firms are essential for the economy and employment levels in the future due to increased market and societal demand for circular products. The enforcement of strict regulations to motivate entrepreneurs to include CE principles in their business model was seen as essential to anticipate and motivate this development. Furthermore, participants did indicate the limited influence of the government on market processes which is to a certain extent in line with the findings of Senker (2011). Societal and/or market demand was indicated as essential to allow for a financially feasible business case for the entrepreneur.

The extent to which government regulations have an effect on the transition to a CE depends on the geographical context in which these regulations are implemented. Participants acknowledged the difficulty of local/regional restrictions for traditional firms since this can lead to the relocation of firms to other areas that would negatively affect the local economy, which is in line with Kitanov (2011) and Senker (2011). However, participants also emphasized the positive influence government facilitation can have on attracting new circular firms (Jackson, 2011; 2017). It seems that government regulation can encourage or discourage circular business to locate in a certain area. Participants ascribed the encouraging role of the government more to the local/regional level to attract new firms and stimulate innovations and collaboration between partners in the area. The restricting role of the government was more oriented to the national level to avoid negative spill-over effects to other regions.

Participants identified greenwashing firms as those firms who do market themselves as circular firms but in fact, do not act upon any of the CE principles. This is in contrast to Bell & Stellingwerf (2012) who also define firms that comply with government regulations as greenwashing firms. Participants did not agree upon this statement that passive adaptation can be seen as greenwashing. In fact, participants agreed upon government regulation as an important driver for the transition to a CE rather than a factor increasing the number of greenwashing firms.

In line with Nguyen & Boberg (2010), participants indicated that the motivation to include CE principles is not solely driven by the formal context (e.g. government regulations). In fact, the informal institutions (personal attitude towards social or environmental issues) were mentioned as important motivations for a CBM mentioned by the participants. In many cases, the choice for a CBM leads to a situation where profit maximization is not the only goal of the entrepreneur which is in correspondence with Roy (1997) and Cohen & Muñoz (2015). For many participants, the personal motivation to create economic value that simultaneously promotes social and/or environmental values was the main reason for the existence, meaning, and direction of their business (Parrish, 2010; Cohen & Winn, 2007). Therefore, it can be stated that intrinsic motivation is indeed an important driver

for the inclusion of CE principles which confirms the findings of Cohen & Muñoz (2015) and Hurst (2016). Nevertheless, Cohen & Muñoz (2015) and Hurst (2016) ascribe this intrinsic motivation as a basic principle of the concept of the purpose economy rather than the CE. A reason for this could be the absence of a definition of circular entrepreneurship in the time those researches were conducted. Based on the findings of this research, it can be stated that purpose-driven entrepreneurship does not differ from how participants identified circular entrepreneurship. All participants indicated that circular entrepreneurship concerns the integration of producing economic, environmental and/or societal value within the geographical context in which the firm operates and this does not differ from the definition of purpose-driven entrepreneurship as given by Cohen & Muñoz (2015) and Hurst (2016).

The paragraphs above confirm that economic opportunities, government restrictions, and intrinsic motivation are indeed important motivations for entrepreneurs to include CE principles in their business model (e.g. Hurst, 2016; Lenczuk, 2017; Cohen & Muñoz, 2015). Some participants indicated other motivations for including CE principles that were not mentioned in the literature studied in chapter 2. In the first place, participants identified a financial motive for including CE principles in their business model. The upcycling, recycling or reuse of resources was mentioned as a way to yield higher revenues by adjusting the production process in such a way that 'leftover' resources would generate profit instead of cost money (to dissimilate them). The financial motive differs from the 'economic opportunity motive' since the former is related to the optimization of the production process itself whereas the latter is concerned with capitalizing on the increased interest for circular products (producing an end product). In the second place, participants identified a 'fun' motive as driver to work on the transition to a CE. The process of developing new, circular products and business models was mentioned as a process that requires innovative thinking and collaboration with other stakeholders. The ability to innovate was mentioned as key characteristic of an entrepreneur and seen as an essential component in order to maintain their business (Autio et al., 2014). Especially the process of trial and error was seen as essential for the transition to a CE. Without entrepreneurs that experiment with new techniques, products, and/or processes, participants indicated that the transition to a CE will not occur. Participants mentioned that it is essential to remember that not all firms will survive this process of trial and error and this shows the participants' recognition of risk and uncertainty as elementary components of being an entrepreneur (Brouwer, 2002; Galindo & Méndez-Picazo, 2013).

In conclusion, the findings of this research validate the earlier findings of Hurst (2016), Lenczuk (2017), and Cohen & Muñoz (2015) who argue that economic opportunities, government restrictions, and intrinsic motivations are important reasons for entrepreneurs to include CE principles in their business model. Participants mentioned the financial motive and the fun motive as additional motivations for implementing a CBM. The financial motive shows that a CBM offers opportunities for entrepreneurs to increase their profit since they will be able to trade their leftover resources instead of paying for the costs associated with obliterating them. Therefore, a CBM could also be interesting for 'traditional' entrepreneurs who aspire a higher profit. The modifications needed to change the production process to receive these benefits will often require investments which might lower the will to do so.

## 5.6. To what extent do barriers/enablers affect the transition process to a CBM?

The findings have shown that participants did not indicate the technological barrier as one of the most prominent barriers impeding the transition to a CE. Participants did not mention the lack of access to

appropriate technologies needed to benefit from 'circular opportunities' as a restricting factor only affecting SMEs, which is in contrast to Rizos et al. (2015). Participants indicated that the unavailability of technologies affects both SMEs and MNCs. Despite the fact that the technological barrier was not mentioned as the most prominent factors impeding the transition to a CE, participants did acknowledge the need for innovations that enhance the ability to continuously reuse resources. Participants did identify that certain technologies still have to be developed in order to transition to a more CBM which is in line with Jesus & Mendonça (2018). Participants did not see the shortage of appropriate technology as a lack of innovation capacity of SMEs as identified by Zamfir et al. (2017). In fact, participants identified SMEs as breeding grounds for innovations due to their ability to quickly change their business vision and processes to adapt to the circular vision. Nevertheless, participants agreed upon the fact that insufficient access to financial resources can slow down the velocity of innovation levels which reflects the findings of Zamfir et al. (2017).

In line with the aforementioned, participants did indicate the availability of and/or access to financial assets as the most important barrier impeding the transition to a CE. The lack of financial funds affects the ability of the entrepreneur to foresee in the investments that are needed to transition to a (more) CBM. The high upfront investment costs of developing a circular product/service were not indicated as a restricting factor limited to SMEs. Despite the fact that these actors can indeed have less financial resources to cover these costs (Rademaekers et al., 2011; Rizos et al., 2015), the return on these investments are uncertain for both SMEs and MNCs which was not identified by Jesus & Mendonça (2018) and Ritzén & Sandström (2017).

Another barrier for including CE principles reported by the participants related to the institutional context in which the entrepreneur operates. Participants agreed upon the fact that the government can facilitate entrepreneurs to transition to a CBM by providing subsidies, which is in correspondence with Rizos et al. (2015) and Stahel (2010). Participants also emphasized that regulations should not only be seen as a way for non-circular firms to force them to implement CE principles (Rizos et al., 2015; Jesus & Mendonça, 2018), but also as a barrier for entrepreneurs who want to act upon those principles. According to the participants, current legislation hinders the level of innovations which are essential to transition towards a CE. The fact that regulations can be seen as a barrier for circular entrepreneurs to (further) include CE principles was not mentioned by Rizos et al. (2015), Stahel (2010) and Jesus & Mendonça (2018).

Participants identified a lack of societal demand for circular products as an important barrier for transitioning to a CBM. This ties in with Meqdadi (2013) and Rademaekers et al. (2011) who state that insufficient demand restricts entrepreneurs to implement a CBM since they are dependent on demand to generate supply. According to the participants, raising consumer awareness is essential to generate this supply. However, they also emphasized that it is extremely difficult to change consumer behaviour, which reflects the earlier research by Liu & Bai (2014). Some participants expressed the need for a product passport which provides information on the materials used in a product as well as the potential of those materials to be reused at the end of the product lifecycle. Such a product passport offers consumers the opportunity to distinguish circular from non-circular products and thus ties in with the perspective of Ghisellini et al. (2016). Only one participant used a collaborative consumption model to bring their product to the market and thus used the method proposed by Korhonen et al. (2018) and Ülkü & Hsuan (2017). Another participant indicated that the transition to a CE will only occur if people

maintain the same welfare and wellbeing standards as experienced in the LE. This reflects the earlier findings of van Weelden et al. (2016) and Armstrong et al. (2015) who argue that circular products should be seen as substitutes, rather than alternatives, for non-circular products in order to accelerate the transition to a CE. Participants identified the collaboration with educational institutions as another factor to increase consumer awareness. Education can serve as a tool to inform and inspire young people (primary education) as well as offer a chance to actively work on the transition to a CE (university students). This link between entrepreneurs and educational institutions was not identified as a stimulating force for the transition to a CE within the literature studied in chapter 2.

Participants identified the market context and organisational context as additional barriers that were not mentioned by Fernández-Serrano & Romero (2014), Ritzén & Sandström (2017), and Jesus & Mendonça (2018). The market context closely correlates to the societal barrier but participants made a distinction between the societal and business context. Whereas the societal barrier mainly addressed the issue of lacking consumer demand, the market context predominantly focuses on a lack of business customer demand. Therefore, these findings add a further specification to the barriers experienced by entrepreneurs. The organisational barrier was mainly mentioned by participants who want to transition from a LBM to a CBM. Current sector specific procedures, for example in tendering, did not allow for a CBM for some participants. The associated increased product costs would not be covered by the market and without demand, participants emphasized they cannot sustain their business. Participants emphasized the issue of suppliers' dependency as an important factor hindering the transition to a CBM since they cannot produce all necessary resources within the own firm (Wooi & Zailani, 2010; Rizos et al., 2015). A system of entrepreneurs who collectively work on integrating CE principles in their business model was mentioned as essential in order to develop circular products and transition to a CE, which corresponds to the findings of Raworth (2017).

In conclusion, the findings of this research have confirmed the expectation that *“various contextual factors cause entrepreneurs to experience a wide range of barriers (e.g. lack of market demand, insufficient technologies, financial costs associated with investments) and enablers (e.g. government regulations, market opportunity, financially interesting) in the process of implementing CE principles in their business model”*. This information can be used for future policy-making that might take away some of the barriers experienced by entrepreneurs to accelerate the transition to a CE.

### 5.7 To what extent does geography affect the ability of entrepreneurs to include CE principles in their business model?

Participants indicated that geography is inherently linked to any of the barriers and challenges as discussed in §5.6. To further enhance the understanding of the effect of geography on the transition to a CE, participants were asked to what extent they collaborated with nearby located partners. Some participants supported the findings of Lacy & Rutqvist (2015) by saying the transition to a CBM should be initiated by the individual entrepreneur but also recognised this will only have limited effects on the transition to a CE and that the opportunities to actually implement a CBM are heavily influenced by the context in which the entrepreneur operates. Therefore, participants emphasize that the ability of the entrepreneur to include CE principles in their business model is heavily influenced by the context in which the entrepreneur operates, such as industry-specific factors, market conditions, and nearness of partners and thus contradicts with Lacy & Rutqvist (2015). In line with Geng & Dobertstein (2008),

participants emphasized the geographical component as essential for certain types of CBM and stated that for, for example, industrial symbiosis it is crucial to be closely located to each other in space to facilitate the exchange of resources (such as excessive heat) (Hobson, 2016; Gregson et al., 2015). In other cases, participants expressed they would rather collaborate with local partners to reduce the transportation costs (financial and environmental). However, for other types of CBMs, this collocation of firms was not seen as essential for the transition to a CE by the participants.

According to Geng & Doberstein (2008), three levels can be distinguished at which the firm can work on CE principles (the micro-, meso-, and macro level), but in the case of the present study, participants recognized a fourth level: the 'network level. The classification of Geng & Doberstein (2008) is mainly focused on the individual business environment and on the relation with society but does not emphasize the dependency of circular entrepreneurs on suppliers' relation to have a CBM. The willingness and motivation of suppliers and procurers to work on the CE is considered more important than the geographical location of those partners (Parida et al., 2017). Participants argued that nearby partners do not necessarily have the expertise or resources needed to make their product 'more circular'. It was considered more important to be part of the right network of suppliers and clients who collectively work on the transition to a CE than to be located in the same demarcated area for the development of a circular product. The geographical concentration of circular firms was not indicated as a factor contributing to the innovation capacity of firms which is in contrast to Belso-Martínez et al. (2017). Participants emphasized collaboration with firms operating in the same economic sector as more important for their innovation capacity in terms of developing circular products. The exchange of non-sector specific resources (such as heat for warming purposes) was seen as an opportunity to make cross-sectoral connections (Hobson & Lynch, 2016). Therefore, the classification of Geng & Doberstein (2008) seems to be too limited to explain the geographical aspect in the transition to a CE.

In conclusion, it remains difficult to fully describe the effect of geography on the ability of entrepreneurs to include CE principles in their business model. The geographical location in which the entrepreneur operates is inherently linked to the contextual factors that determine the barriers and/or enablers experienced by the individual and thus it becomes difficult to dismantle the geographical effect from the barrier. In general, it seems that geographical proximity to other firms is only considered important to facilitate the exchange of those resources that cannot be easily transported over long distances (e.g. heat). This study did not find any indications that the co-location of businesses has a considerable effect on the innovative capacity of the entrepreneur. This could be a result of the 'newness' of the topic being studied in this research. The absence of circular entrepreneurs in the same location can drive the need to look for partners outside the region.

#### 5.7.1. Northern Netherlands as a leader for the transition to a CE

The extent to which the participants assigned a specific role to the Northern Netherlands in the transition to a CE differed. The ambition to become the 'most circular region' in the Netherlands has contributed to the awareness of entrepreneurs and has stimulated initiatives that aim to contribute to this ambition. Especially provincial and regional regulations were seen as a way to stimulate CE initiatives by taking away barriers (e.g. allow for cross-sectoral use of resources) or facilitate and stimulate entrepreneurs (e.g. providing subsidies) (Hobson, 2016). Participants acknowledged that some provincial and regional regulations partly dependent on national decisions but stated that the province or region does have some autonomy to develop the funds needed to meet their ambition.

Furthermore, participants who ascribed the region an important role in the transition to a CE mainly cooperated with local partners for their entire product chain (from input resources, to product, to output resources). Participants who were more dependent on national or international partners emphasized the need to look beyond regional borders for the transition to a CE. However, participants did ascribe the Northern Netherlands a role as facilitator (e.g. provide subsidies and develop platforms where circular entrepreneurs can meet) and enabler (e.g. develop provincial and regional policy that stimulate circular entrepreneurship as well as lobby for appropriate national legislation) which is in correspondence with the earlier findings of Hobson (2016), Heshmati (2015) and Kircherr et al. (2017).

## Chapter 6: Conclusion

The present study set out to identify the motivations, challenges, and barriers experienced by circular entrepreneurs and to study whether or not geography plays a role in any of these aspects. The CE is seen as a model that integrates environmental, social, and economic objectives while focusing on several core principles, namely: design for reuse, build resilience through diversity, relying on renewable energy, think in systems, and industrial symbiosis (Raworth, 2017; Lewandowski, 2016). The aim of the CE is to develop an economy that moves away from the current linear relation between inputs and economic growth to an economy that constantly reuses resources to generate economic prosperity while at the same time generate positive environmental and/or social effects (Hobson, 2016; Murray et al., 2017). This study aimed to give a definition of a circular entrepreneur. It is believed that a good description of the concept can help sharpen the understanding of the CE concept among scholars and practitioners. Furthermore, the research aimed to identify the most important motivations that drive entrepreneurs to include CE principles and which barriers and challenges they experience while doing so. To the best of our knowledge, no earlier studies have analysed the motivations, challenges, and barriers of SME entrepreneurs who are located in the Northern Netherlands and examined to what extent geography has an effect on these aspects. The importance of studying this topic is seemingly underestimated, as circular entrepreneurs can have a considerable impact on the national transition to a CE and SMEs account for the majority of businesses in the Dutch economy. Therefore, this research has conducted a qualitative case study research on circular entrepreneur at the SME level in the Northern Netherlands over the course of several months. A total of 17 interviews were conducted of which 15 took place with circular entrepreneurs and two with experts from organisations representing the interests of circular entrepreneurs. This chapter discusses the results presented in chapter 5 and provides final answers to the research questions. First, the role of the entrepreneur in the transition to a CE is discussed and the extent to which they include CE principles in their business model. Afterwards, the most important motivations, challenges, and barriers experienced by entrepreneurs are discussed. Finally, the effect of geography on any of the aforementioned aspects is evaluated.

The entrepreneur was identified as a significant actor in the transition to a CE by changing the LBMs that have caused many environmental and/or social issues to CBMs to alter these negative consequences of their production processes. The role of the entrepreneur in the transition to a CE was mainly described as the innovator that develops the new techniques and business models that are essential to facilitate this change. The transition to a CE was seen as an inevitable development upon which entrepreneurs have to anticipate in order to proceed with their business in the future.

This research did not find a clear indication that certain CBMs are more often implemented than others. Therefore, the extent to which CE principles were included in the business models varied amongst the entrepreneurs. In general, the classification of CBMs offered by Bocken et al. (2016) was identified as a useful tool for identifying the various types of CBMs used by entrepreneurs. It was found that entrepreneurs can act upon multiple types of CBMs at the same time. This seems to identify the importance of recognizing that the classification as proposed by Bocken et al. (2016) offers an interesting framework for analysing the extent to which entrepreneurs include CE principles but should not be used as a rigid instrument for categorization.

The main motivations that were found in this research for including CE principles in a business model were economic opportunities, government restrictions, intrinsic motivation, financially interesting, and fun to find new alternatives (Hurst, 2016; Lenczuk, 2017; Cohen & Muñoz, 2015). It is found that circular entrepreneurship differs from sustainable entrepreneurship since not all participants were predominantly motivated by their intrinsic motivation to 'do good'. Circular entrepreneurship could also be an interesting option for 'traditional' entrepreneurs who can capitalize on the flow of resources over time while by chance contributing to a more sustainable environment.

It appears that the majority of the challenges and barriers experienced by the participants confirm the ones identified by the literature study in chapter 2 (Fernández-Serrano & Romero, 2014; Ritzén & Sandström, 2017). A noticeable result is that the technological barrier was not indicated as the most prominent barrier impeding the transition to a CE. In fact, participants saw the technological component as an enabler for the transition to a CE and SMEs were mentioned as an important factor for the development of the necessary innovations. In line with earlier research, the lack of access to financial funds and the institutional context were mentioned as the most important barriers impeding the transition to a CE. Finally, the lack of market demand and the difficulty in finding the right partners to set up a CBM were mentioned as important barriers for entrepreneurs who want to include CE principles in their business model. The lack of market demand was further specified into a lack of consumer – and business demand. A change in human behaviour in favour of circular products would lead to a direct increase in consumer demand as well as an indirect increase in business demand (since businesses in the entire product chain will have to act upon CE principles to produce a circular product). In other words, it was found that raising consumer awareness is essential for generating the demand for circular products and thus for the transition to a CE.

The question to what extent geography affects the ability of entrepreneurs to include CE principles in their business model will be concluded with tentative conviction. The geographical location in which the entrepreneur operates is inherently linked to the contextual factors that determine the barriers and/or enablers experienced by the individual and thus it becomes difficult to dismantle the geographical effect from the experienced barriers and challenges. For the majority of the motivations mentioned by participants, the geographical effect was not considered a substantial factor influencing the inclusion of CE principles in their business model. Only for those participants for which government restrictions serve as the dominant explanatory variable for their motivation, it can be argued that the geographical context has a notable effect. Government restrictions could vary between regions and/or countries and thus affect the motivations of circular entrepreneurs (e.g. without those government restrictions they might not include CE principles) (Jesus & Mendonça, 2018; Rizos et al., 2015). Furthermore, the three systems mentioned by Geng & Doberstein (2008), the micro-, meso-, and macro level were considered as important geographical scales at which the transition to a CE can take place. However, participants identified the 'network scale' as an important, fourth geographical level that should be taken into consideration when studying circular entrepreneurship. It seems that geographical proximity to other circular entrepreneurs was only considered to be important for the exchange of resources that cannot be transported over long distances or for those resources for which it was environmentally and/or economically beneficial to be managed locally. It was found that collaborating with other circular entrepreneurs who have the same aspirations and motivations to act upon CE principles was considered far more important than the geographical location of that partner. Nevertheless, it was recognized that it could be easier to meet other circular entrepreneurs within the



same region as in which the participant was located than to meet them when they are located at the other side of the country. This study did not find any indications that the nearness of circular entrepreneurs had any effect on the innovative capacity of one firm which contradicts to Belso-Martínez et al. (2017). It was found that the willingness and motivation of suppliers and procurers to work on CE principles was considered far more important for the development of circular products than the geographical proximity of those partners. Without the commitment of these partners, it is nearly impossible for a single entrepreneur to produce a circular product given that almost all products are developed in a chain in which multiple firms are included. In other words, in order to develop a circular product, entrepreneurs need to collaborate with like-minded partners that are willing to change practices within their business model to facilitate the inclusion of CE principles in another business model in other sections of the product chain. Hence, the network scale was mentioned as an additional geographical level to the framework of Geng & Doberstein (2008) at which the transition to a CE takes place. An explanation for this finding could be found in the novelty of the concept and the fact that there are relatively few entrepreneurs acting upon CE principles in this region. Due to the absence of local partners, circular entrepreneurs are forced to look for companions in a wider geographical area.

In conclusion, the main motivations of entrepreneurs for implementing CE principles in their business models are economic opportunities, government restrictions, intrinsic motivation, financially interesting, and fun to find new alternatives. The main barriers and challenges that have proven to influence the (further) implementation of CE principles are the lack of access to financial funds, the institutional context, a lack of market demand (both from a societal and business context), and finding suitable partners. Interestingly, in contrast to earlier research (Jesus & Mendonça, 2018), it was found that the technological barrier was not indicated as the most prominent barrier impeding the transition to a CE. In fact, the technological aspect was mentioned as an important enabling factor that could accelerate the transition to a CE. The technology was seen as essential for the development of future innovations that allow businesses to include (more) CE principles in their business model. The costs and knowledge needed to develop these innovations were indicated as a factor that could hamper the transition to a CE. However, the entrepreneur was identified as the main innovative actor in society and thus responsible for developing these new techniques. As a consequence, the entrepreneur was identified as the driver and beneficiary of the transition to a CE. It remains difficult to exactly determine the effect of geography on the motivations, challenges, and barriers experienced by entrepreneurs. In general, it seems that the geographical effect is only an explanatory variable in the case of government restrictions as the main motivation of the entrepreneur to include CE principles. It seems that the geographical effect is more prominent in relation to the barriers and challenges experienced by the entrepreneurs. In fact, all four most prominent barriers identified by this research (lack of access to financial funds, the institutional context, a lack of market demand (both from a societal and business context), and finding suitable partners) can directly be associated with the geographical context. This provides the valuable insight that the motivation and barriers experienced by entrepreneurs seem to exist at different scalar levels. It was found that the motivation to include CE principles can mainly be associated with the individual level (e.g. intrinsic motivation to do good or the motivation to yield higher profits by using a CBM) whereas the barriers and challenges experienced by entrepreneurs can be related to the context in which the entrepreneur operates. Hence, the dismissal of these barriers influenced by geographical context seems to offer room to accelerate the transition to a CE.

## 6.1. Recommendations for policy-making

The fact that the geographical context seems to have an effect on the barriers experienced by entrepreneurs offers interesting insights for policy-making since this can influence these geographical determined factors. This research suggests that in order to accelerate the transition to a CE, governments can actively work on removing some barriers and challenges experienced by entrepreneurs. In the first place, an improved access to financial funds will stimulate the necessary technological innovations to include (more) CE principles in a business model. Second, the removal of institutional barriers by changing laws and regulations will allow for more opportunities for entrepreneurs to exchange resources and to foster the closure of resource networks. Finally, the lack of market demand can be altered by governmental institutions deliberately choosing for circular entrepreneurs. It was found that this government stimulus was seen as essential to spark the transition to a CE. The costs associated with circular products are often higher than 'traditionally' produced products which forms an obstacle for the market to embrace these products. The government could serve as the actor representing the interest of the commons by solely investing in circular products to incentivise entrepreneurs to act upon CE principles. This could lead to an increased level of CE products and innovations, which ultimately contributes to lower prices for these products and thus they become available for the entire market. Furthermore, governmental investments in CE products would be in line with their objective of having a CE in the Netherlands in 2050. Hence, it was found that governmental institutions have the potential to eliminate certain barriers and challenges experienced by entrepreneurs to accelerate the transition to a CE. Therefore, it is essential that these governmental institutions develop new policy and regulations in close collaboration with current circular entrepreneurs of various economic sectors to ensure that these regulations do not remove a certain barrier in one sector but impose a barrier in another sector.

## 6.2. Recommendations for further research

The explorative and qualitative nature of this case study has aimed to contribute to the existing knowledge on circular entrepreneurship at the SME level in the Northern part of the Netherlands. Reflecting on the findings and trends uncovered, the researcher proposes that some topics require a more detailed examination to verify the findings of this research. Firstly, partly based on the outcomes of this research, a quantitative study design could offer a more thorough understanding of circular entrepreneurship by studying a wider population on a larger geographical scale. Such a research design could indicate other types of motivations, challenges, and barriers that were not found in this particular research. The outcomes of a quantitative case study conducted with numerous circular entrepreneurs could serve as the foundation upon which generalisations on the topic can be made. This would serve as interesting input for future policy-making. In the second place, as indicated in §4.3.5, the financial motive is mentioned by some participants as an important motivation for the inclusion of CE principles. This shows that circular entrepreneurs are sometimes mainly motivated by financial opportunities rather than have the wish to contribute to a better social and/or ecological environment. Based on this, it could be assumed that a CBM also offers opportunities for 'classic' entrepreneurs that are mainly directed at profit maximization. By informing those entrepreneurs the opportunities a CBM holds, the transition to a CE could possibly be accelerated. Future research could study whether or not this assumption holds true and if so, what needs to be done to motivate these classical entrepreneurs towards a CBM. A third and final proposition for future research would be to have a more detailed examination of sector-specific challenges and barriers to provide more detailed

insights for policy implications. In general, all future researches should be aware that entrepreneurial behaviour should be studied in a holistic context to understand the wide range of contextual factors that influence this behaviour.

### 6.3. Reflection on the research process

It should be acknowledged that the outcomes of this research depend on a qualitative case study design that aimed to improve the understanding of the motivations, challenges, and barriers experienced by circular entrepreneurs located within the Northern Netherlands. This has provided the perspectives and experiences of a small number of entrepreneurs and when interpreting the results, it is important to keep in mind that the findings represent their objectives and personal influences, and thus may not fully explain the phenomenon.

The research process took longer than initially expected. It turned out to be rather difficult and time-consuming to find participants for the semi-structured interviews. On the one hand, this was expected since I desired to study a topic relatively new to the field of Economic Geography. On the other hand, the confronted hurdles in the data collection process were not easy to overcome. Due to the absence of a formal definition of a circular entrepreneur, the researcher had to develop its own definition of the concept. In hindsight, the chosen definition might have been too broad which led to a wide variety of entrepreneurs included in the research, and consequently, a wide variety in motivations, challenges, and barriers described by the participants. It is possible that this has influenced the comparability and interpretability of the data. The entire process of defining the concepts, finding the participants, and analysing the interviews has made me realize that defining a manageable scope is essential for a focused research. However, it is difficult to define this research scope beforehand when the required knowledge is not extensive.

The fact the researcher did not have any experience with conducting interviews could be seen as another limiting factor that has influenced the outcomes of this thesis. Especially the first interviews were not always focused on the questions as stated in the interview guide. Furthermore, the researcher paid attention to not steering the conversation into a particular direction but a thin line exists between asking follow-up questions and being suggestive which could have slightly influenced the outcomes of this research.

Finally, the interviews were conducted in Dutch whereas this thesis is written in English. This required the translation of quotes from Dutch to English. Despite efforts to avoid the loss of valuable information, it could be that this translation process has resulted in minor changes in the meaning of examples/experiences given by the participants.

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# Appendices

## 1. Informed consent

The informed consent is stated in Dutch since all interviews were conducted in Dutch.

Mijn naam is Elza van der Meer en ik ben student Economische Geografie aan de Rijksuniversiteit Groningen. Ter afsluiting van deze opleiding onderzoek ik de rol van de ondernemer in de transitie naar een circulaire economie. De focus van dit onderzoek ligt op het achterhalen van de motivaties van ondernemers om circulair te ondernemen en de mogelijke belemmeringen die zij ondervinden tijdens dit proces. Daarnaast onderzoek ik of het geografische aspect (de locatiekeuze van het bedrijf) van invloed is, en of/wat voor effect dit heeft, op de keuze om circulair te ondernemen. Het doel van dit onderzoek is tweezijdig. Aan de ene kant probeer ik door middel van interviews te achterhalen wat de beweegredenen zijn van ondernemers om circulair te ondernemen. Deze informatie wordt voornamelijk gebruikt voor het leveren van een bijdrage aan de wetenschappelijke literatuur gerelateerd aan circulair ondernemen. Aan de andere kant dienen de interviews als een manier om te achterhalen welke belemmeringen ondernemers ondervinden in het toepassen van circulaire principes in hun business modellen. Deze informatie wordt gebruikt om de desbetreffende hinderende factoren in kaart te brengen. In de toekomst zou deze informatie eventueel gebruikt kunnen worden om organisaties in te lichten over de belemmeringen die ondernemers ervaren om vervolgens naar aanleiding hiervan bepaalde zaken te bespreken, dan wel veranderen en/of verbeteren.

De interviews zullen worden geanalyseerd en vervolgens gebruikt worden voor mijn afstudeeronderzoek. Deelname aan het interview is volledig vrijwillig. U heeft ten allen tijde de mogelijkheid om vragen niet te beantwoorden.

De data die voortkomt uit het interview zal vertrouwelijk behandeld worden. De uitkomsten van deze scriptie kunnen worden doorgegeven aan derden (lokale overheid, andere organisaties etc.), aangezien de scriptie openbaar toegankelijk is. U wordt niet met naam en toenaam in het onderzoek genoemd. U kunt uiteraard de uitkomsten van het onderzoek inzien alvorens het project ingeleverd wordt. Daarnaast heeft u de mogelijkheid om de uitkomsten van het onderzoek te ontvangen zodra deze is afgerond.

Gaat u akkoord met bovenstaande voorwaarden?

Enkel indien akkoord kan de recorder worden aangezet!



## 2. Interview guide entrepreneurs

The interview guide for this research can be found below. The first table shows the questions as were asked during the interviews. The second table contains the questions in English.

Goal	Vragen
Introduction	Persoonlijke informatie → kunt u uzelf introduceren?
Practical information	Wat is uw rol binnen de onderneming/organisatie Wat voor een product/dienst produceert dit bedrijf?
Set the context	Op welke manier(en) worden er circulaire principes toegepast op de productie van het product? → in welke fasen van het productieproces? → welk deel van het business model is circulair? (design, input, output) Vanaf wanneer is het bedrijf bezig met circulaire principes toepassen in het productieproces? → hoe lang heeft het geduurd voordat eerdere methoden werden vervangen door deze circulaire techniek? De manier waarop u op deze manier het product produceert is anders dan de 'traditionele manier'. Ziet u de techniek die u nu gebruikt als een innovatie/verbetering ten opzichte van de eerder gebruikte techniek? Wat is uw rol geweest in het toepassen van circulaire principes in het productieproces? Hoe ziet u de rol van de ondernemer in de transitie naar een circulaire economie?
Motivations for implementing CE	Waarom heeft u ervoor gekozen om via de principes van de circulaire economie te gaan ondernemen/produceren? (persoonlijke motivatie, verbeteren milieu, financiële redenen, sociale redenen) Wat is het doel van uw bedrijf ten opzichte van het bijdragen aan transitie naar de circulaire economie? Wanneer vindt u dat dit doel bereikt is?
Barriers to implementing CE	Heeft u problemen ervaren tijdens het invoeren van deze circulaire bedrijfsprincipes in de onderneming? → waren deze problemen vooral een gevolg van problemen binnen de organisatie (zoals bijvoorbeeld motivatie, technologie, financiële middelen) of meer door externe factoren (overheid, maatschappij, technologisch, financieel). Welke factor zou u omschreven als datgene wat het meest hinderlijk is in de implementatie van CE principes in uw bedrijf. Wat belemmert huidige en (eventueel) toekomstige ontwikkelingen? Denkt u dat het mogelijk is dat die factoren veranderen? → en op welke termijn? Wat denkt u dat het meest belangrijk is om te veranderen om het voor ondernemers aantrekkelijker te maken om (meer) circulaire principes in hun bedrijfsmodel toe te passen? → zijn deze factoren onder invloed van de onderneming/ondernemer zelf of meer afhankelijk van externe factoren? Ziet u een relatie tussen de verschillende factoren die u nu eventueel belemmeren om te veranderen naar een (nog meer) circulair bedrijfsmodel? (bijv. als een factor verbetert, is het automatisch ook makkelijker om andere zaken uit te voeren).
Role of geography	Is er een bepaalde reden waarom u op deze locatie bent gevestigd met uw bedrijf?

	<p>Ziet u enige relatie tussen de plek waar uw bedrijf zit en de manier waarop u circulaire principes toepast binnen het bedrijf?</p> <p>Werkt u samen met andere bedrijven op het toepassen van circulaire principes? → bijvoorbeeld samenwerken om afval tegen te gaan. → zo ja, met welke bedrijven werkt u op welke manier samen, wat zijn de ervaringen ten opzichte van deze samenwerking?</p> <p>Hoe ziet u het belang van de samenwerking van bedrijven om meer circulair te kunnen zijn? → is het belangrijk om onderdeel van een netwerk te zijn, of is het mogelijk individueel zo veel mogelijk te doen.</p> <p>Ziet u in de toekomst mogelijkheden om (meer) samen te werken met andere circulaire ondernemers om zo nog duurzamer te worden? → hoe</p> <p>Heeft u aspiraties om in de toekomst nog verder te gaan met circulair ondernemen? → zo ja, wat? → zou u daarvoor eventueel naar een andere locatie verplaatsen? → zo ja, wat is daar dan voor nodig om te verplaatsen?</p> <p>Algemene vraag: wat denkt u dat essentieel is in Noord-Nederland (of op nog groter schaalniveau) om de transitie naar een circulaire economie te versnellen?</p>
Additional information	<p>Heeft u vragen en of toevoegingen?</p> <p>Kent u toevallig andere ondernemers in Noord-Nederland die via CE principes hun bedrijf runnen, en die wellicht geïnteresseerd zijn voor een interview?</p>

Goal	Questions
Introduction	1. Personal information → Could you please introduce yourself
Practical information	<ol style="list-style-type: none"> <li>1. What is your role within the organization?</li> <li>2. What does the organization produce/provide?</li> <li>3. What has been your role in the implementation of CE principles in the organization?</li> </ol>
Set the context	<ol style="list-style-type: none"> <li>1. How are CE principles applied in the products/production process? → in what parts are they applied → what parts of your business model are considered to be CE?</li> <li>2. When did the organization decide to implement CE principles? → how long did it take before the 'new, circular' techniques were in place?</li> <li>3. The way in which you do business can be seen as different from 'traditional' way of doing business. Do you see the technique that you use as an innovation?</li> <li>4. How do you see the role of the entrepreneur in the transition to a CE?</li> </ol>
Motivations for implementing CE	<ol style="list-style-type: none"> <li>1. Why did you decide to use the concept of CE? (personal, social, environmental, economic motivations?)</li> <li>2. What is the overall goal of the organization in relation to a circular economy?</li> <li>3. When is this goal achieved?</li> </ol>
Barriers to implementing CE	<ol style="list-style-type: none"> <li>1. Did you face any difficulties during the implementation of CE principles in your organization? → from within the organizational context (motivations, technology, financial?) → from external context (society/governmental, possibly also technological/financial)</li> <li>2. Which one of these barriers would you mention as the most important drawback of implementing CE principles (possibly also currently limiting your options as entrepreneur to be fully circular)</li> </ol>

	<p>3. Do you see the possibility of changes in these barriers in the futures?</p> <p>4. What do you think is necessary to change these barriers to make it easier for firms to transition to CBM? → are these barriers influential by the firm/entrepreneur itself or are there other barriers that require governmental/societal change?</p> <p>5. Do you see a relation between the barriers? (if one barrier diminishes, it can lead to other barriers becoming less)</p>
Role of geography	<p>1. Are the specific reasons why you are located in this place?</p> <p>2. Do you see any relation between your location and the way in which you implement CE principles? → how</p> <p>3. Do you work together with other firms on CE principles? → which ones, how does this work, what are the experiences?</p> <p>4. How do you see the importance of being able to connect with other circular entrepreneurs? → how important to be part of a network</p> <p>5. What factors would be important for you to consider relocation?</p> <p>6. How would you see the future of the circular economy? With who would you collaborate?</p> <p>7. What do you think is necessary to accelerate the transition to a CE?</p>
Additional information	<p>1. Do you have any questions?</p> <p>2. Do you possibly know other entrepreneurs that implement CE principles that would possibly be interested in an interview?</p>

### 3. Interview guide experts

This interview guide contains the questions asked during the interviews with experts from organisations that represent the interests of circular entrepreneurs. The first table shows the questions as were asked during the interviews. The second table contains the questions in English.

Goal	Vragen
Introduction	Persoonlijke informatie → korte introductie
Practical information	Wat is uw rol binnen de onderneming/organisatie? Wat houdt de organisatie in?
Set the context	Hoe zou u de circulaire economie omschrijven? Waarom vindt u het van belang er aandacht komt voor onderwerpen als de circulaire/betekenisvolle economie? Wanneer is een bedrijf circulair? Op welk schaalniveau moet het bedrijf voldoen aan de eisen? Hoe ziet u de rol van de ondernemer in de transitie naar een circulaire/betekenisvolle economie?
Motivations for implementing CE	Waarom denkt u dat ondernemers steeds meer bezig zijn met de circulaire economie en verantwoord ondernemen? Waarom komt er steeds meer interesse voor? Vanuit u eigen netwerk, wat ziet u dat meer gebruikelijk is: een bedrijf dat van voor af aan begint met circulair ondernemen of een bestaand bedrijf dat zich ombuigt? Waarom denkt u dat die vorm vaker voorkomt? Waarom bent u begonnen/gaan werken met/bij deze organisatie?
Barriers to implementing CE principles	In welke mate ziet u belemmeringen voor ondernemers om circulair te ondernemen? Wat voor belemmeringen komen het vaakst voor? Wat denkt u dat er moet gebeuren om die belemmeringen weg te halen? Zijn er belemmeringen die jullie zelf meemaken?
Business information	Uw organisatie is een soort overkoepelend orgaan dat meerdere ondernemers probeert samen te brengen. Wat is het uiteindelijke doel van uw organisatie? Waarom is het noodzakelijk dat dergelijke organisaties bestaan? Op het moment zijn er meerdere van zulke organisaties (Circulair Friesland, Betekenisvol ondernemen Noord Nederland, Impact Noord, Betekenisvol Drenthe etc.). Hoe denkt u dat dit zich in de toekomst gaat ontwikkelen? (meer kleinere organisaties of één groot overkoepelend orgaan) Krijgt u vanuit jullie leden geluiden te horen met betrekking tot circulaire economie? Zo ja, wat? Wat zijn u doelen met betrekking tot het ontwikkelen van u organisatie?
Role of geography	Ziet u een bepaalde rol voor Noord-Nederland in de transitie naar een circulaire economie? Ja/nee leg uit Ziet u een belang van de nabijheid van andere circulaire ondernemers om bij te dragen aan een circulaire economie? Zo ja/nee leg uit. Waarom zitten jullie op deze locatie? Hoe ziet u het belang van samenwerking tussen bedrijven om meer circulair te zijn? Algemene vraag: wat denkt u dat essentieel is in Noord-Nederland de transitie naar een circulaire economie te versnellen?
Additional information	Heeft u nog vragen en/of opmerkingen?

Goal	Vragen
Introduction	Personal information → short introduction
Practical information	What is your role within the organisation? What is the core business of the organisation?
Set the context	How would you describe the circular economy? Why do you find it important there is (more) attention for concepts such as the circular economy? When would you consider a firm circular? At which level does the firm have to be circular? (whole production chain or just within the own firm) How would you describe the role of the entrepreneur in the transition towards a circular economy?
Motivations for implementing CE	Why do you think more and more entrepreneurs are focusing on concepts such as the circular economy and responsible entrepreneurship? Where does this interest come from? From your own experience and network, what do you more often?: a business that starts from scratch and immediately focuses on a circular business model or a 'traditional' firm that changes its business model? Why did you start (working) with this organisation?
Barriers to implementing CE principles	To what extent do you see barriers for entrepreneurs to implement CE principles in their business model? Can you describe the barriers that are most prominent? What do you think needs to happen in order to remove (some of) the barriers? Do you experience certain barriers within the organisation?
Business information	This kind of organisation is some sort of overarching organisation that aims to bring entrepreneurs together. What is the goal of your organisation? Why is it essential that these kinds of organisations exist? At the moment there are multiple organisations like this one (Circulair Friesland, Betekenisvol ondernemen Noord Nederland, Impact Noord, Betekenisvol Drenthe etc.). how do you see this develop in the future? More relative small organisations or one large organization that represents the interest for (e.g.) the whole of the Netherlands? From your members, do you hear any interest/motivation/barriers in relation to the concept of the circular economy? Explain. What would you like to accomplish with this organisation?
Role of geography	Do you see a certain role for the Northern Netherlands in the transition to a circular economy? Explain Do you think it is important that circular entrepreneurs are located close to entrepreneurs with the same vision? Explain Why is your business/organisation located in this place? How would you describe the necessity of collaboration between firms that aim to become more circular? General question: what do you think is essential for the Northern Netherlands in order to speed up the transition to a circular economy?
Additional information	Do you have any questions or remarks?

#### 4. Degree of urbanisation classification

Category	Explanation	Code
Extremely urbanised	2,500 addresses or more per square kilometre	1
Strongly urbanised	1,500 to 2,000 addresses per square kilometre	2
Moderately urbanised	1,000 to 1,500 addresses per square kilometre	3
Hardly urbanised	500 to 1,000 addresses per square kilometre	4
Not urbanised	Fewer than 500 addresses per square kilometre	5

Based on: CBS (2018b)